Curriculum Vitae
Gregory A. Clark, Ph.D.

Current through June 2023 (plus selected information beyond)

Contact Information

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Education

Ph.D. University of California, Irvine, Department of Psychobiology, 1982
B.A. Brown University, Psychology, 1975

Primary Professional Positions

Professor, Department of Biomedical Engineering, University of Utah, 7/2021-present
Director, Center for Neural Interfaces, University of Utah, 2015- present
Adjunct Associate Professor, Department of Computer Science, University of Utah, 2009-present
Associate Professor with tenure, Department of Bioengineering, University of Utah, 2001-present
Associate Professor, Department of Bioengineering, University of Utah, 1996-present
Assistant Professor, Department of Psychology, Princeton University, 1988-1996
Instructor of Clinical Neurobiology, Department of Psychiatry and the Center for Neurobiology and Behavior, Columbia University, College of Physicians and Surgeons, 1986-1988
Research Associate, Howard Hughes Medical Institute for Molecular Neurobiology at Columbia University, College of Physicians and Surgeons, 1984-1988
Postdoctoral Fellow, Center for Neurobiology and Behavior, Columbia University, College of Physicians and Surgeons, 1982-1984
Lecturer, Department of Psychology, Stanford University, 1981

Other Appointments

Visiting Researcher, Friday Harbor Laboratories, University of Washington, Summer 2004, 2005, 2006

Research Experience

Current Research

Neuroprostheses; bio-based neuroengineering; sensory information processing; motor decodes

Postdoctoral Research

Cellular mechanisms of learning and neuronal plasticity in the sea snail *Aplysia californica*
Advisor: Eric R. Kandel, Columbia University, College of Physicians and Surgeons

Graduate Research

Role of cerebellum and limbic structures in classical conditioning of the rabbit nictitating membrane/eyeblink response. Advisor: Richard F. Thompson, University of California, Irvine

Honors, Prizes, and Awards

Dean's Selection as one of the Top Recipients of Extramural Funding, College of Engineering, University of Utah, 2020: Research Expenditures $500,000 to $1M
Dean's Selection as one of the Top Recipients of Extramural Funding, College of Engineering, University of Utah, 2018: Research Expenditures $500,000 to $1M
Dean's Selection as one of the Top Recipients of Extramural Funding, College of Engineering, University of Utah, 2014: Research Expenditures $500,000 to $1M
Dean's Selection as a Top Graduate Teacher, College of Engineering, University of Utah, 2014
Dean's Selection as one of the Top Recipients of Extramural Funding, College of Engineering, University of Utah, 2013
Dean's Selection as a Top Graduate Teacher (Lectures), College of Engineering, University of Utah, 2013
Dean's Selection as a Top Undergraduate Teacher (Labs, Discussions, Seminars), College of Engineering, University of Utah, 2012
Deans' Letter of Commendation for selection as one of the top instructors, College of Engineering, University of Utah, 2011
Deans' Letter of Commendation for selection as one of the top instructors, College of Engineering, University of Utah, 2008
Deans' Letter of Commendation for selection as one of the top instructors, College of Engineering, University of Utah, 2002
Deans' Letter of Commendation for selection as one of the top instructors, College of Engineering, University of Utah, 2000
Pew Biomedical Scholar Award, 1989-1995
Alfred P. Sloan Fellowship, 1990-1992
NIMH Postdoctoral Fellowship, 1982-1984
NIMH Predoctoral Fellowship, 1981-1982
University of California Regents' Dissertation Fellowship, 1980
Edward G. Steinhaus Graduate Student Teaching Award, University of California, Irvine, 1979
Chancellor's Patent Fund Award, 1979
Regents' Fellow of the University of California, 1976

Personal Data

Born: 14 June 1954, New York, NY
Married
Two children

Teaching

1. Courses Taught

University of Utah Didactic Courses

Taught or co-taught > 53 Biomedical Engineering/Bioengineering courses (11 different courses) since Fall 1996; plus administrative responsibilities for ~15 Neuroscience courses as the Neuroscience Program Curriculum Chair.

Fall 2022. BME 3202, *Physiology for Engineers*, 4 cr hr, 94 students. Taught ~2/3 of course, Lecture section.
Spring 2022. BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 27 students. Lecture and Discussion. Taught ~90% of course.

Fall 2021. BME 3202, *Physiology for Engineers*, 4 cr hr, 94 students. Taught ~2/3 of course, Lecture section.
Spring 2021. BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 27 students. Lecture and Discussion. Taught ~90% of course.

Fall 2020. BME 3202, *Physiology for Engineers*, 4 cr hr, 85 students. Taught ~2/3 of course, Lecture section.
Spring 2020. BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 14 students. Lecture and Discussion. Taught ~90% of course.

Fall 2019. BIOEN 3091, *Current Research in Bioengineering.* 1 cr hr. Guest lecture, 28 Aug. 2019. "Toward a Real-world Luke Skywalker: Restoring Sensorimotor Function after Limb Loss."
Fall 2019. BME 1010, *Careers in Biomedical Engineering*.1 cr hr. Guest lecture, 21 Nov. 2019. "From Sea Slug Butts to Luke Skywalker: Careers in Neuroprosthetics & Neuroengineering."
Fall 2019. BME 3202, *Physiology for Engineers*, 4 cr hr, 88 students. Taught ~2/3 of course, Lecture section.
Fall 2019. BME 7870, *Neural Engineering Research Group*. 1 cr hr. Guest presentation, overview (followed by lab members), 3 Sept. 2019, "Toward a Real-world Luke Skywalker: Restoring Sensorimotor Function after Limb Loss."
Spring 2019. BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 25 students. Lecture and Discussion. Taught ~90% of course.
Spring 2019. BIOEN 5460, *Engineering Aspects of Clinical Medicine.* Guest Lecture, 31 Jan. 2019. "Restoring Sensory & Motor Function with Peripheral Nerve Interfaces."

Fall 2018. BIOEN 3202, *Physiology for Engineers*, 4 cr hr, 86 students. Taught ~2/3 of course, Lecture section.
Fall 2018. BME 1010, *Careers in Biomedical Engineering*.1 cr hr. Guest lecture, 18 Nov. 2018. "From Sea Slug Butts to Luke Skywalker: Careers in Neuroprosthetics & Neuroengineering."
Fall 2018. BIOEN 3091, *Current Research in Bioengineering.* 1 cr hr. Guest lecture, 5 Dec. 2018. "Luke Skywalker: From Science Fiction to Emerging Reality."

Spring 2018, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 19 students. Lecture and Discussion. Taught ~90% of course.

Fall 2017. BIOEN 3202, *Physiology for Engineers,* 4 cr hr, 83 students. Taught ~2/3 of course, Lecture section.
Fall 2017. BME 1010, *Careers in Biomedical Engineering*.1 cr hr. Guest lecture, 14 Sep. 2017. "Careers in Neuroprosthetics & Neuroengineering."
Fall 2017. BIOEN 3091, *Current Research in Bioengineering.* 1 cr hr. Guest lecture, 20 Sep. 2017. "It Takes a Lot of Nerve: Restoring Sensorimotor Function after Limb Loss or Spinal Cord Injury"

Spring 2017, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 23 students. Lecture and Discussion. Taught ~80% of course.

Fall 2016. BIOEN 3202, *Physiology for Engineers,* 4 cr hr, 75 students. Taught ~2/3 of course, Lecture section.
Spring 2016, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 21 students. Lecture and Discussion. Taught ~80% of course.
Fall 2015. BIOEN 3202, *Physiology for Engineers,* 4 cr hr, 80 students. Taught ~2/3 of course, Lecture section.
Spring 2015, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 22 students. Lecture and Discussion. Taught ~80% of course.
Spring 2015, NEUSC 6200, *Pain/Function Disorders*, 1 cr hr, 3 students. Nominal instructor only.
Fall 2014. BIOEN 3202, *Physiology for Engineers,* 4 cr hr, 62 students. Taught ~2/3 of course, Lecture section.
Spring 2014, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 31 students. Lecture and Discussion. Taught ~80% of course.
Fall 2013. BIOEN 3202, *Physiology for Engineers,* 4 cr hr, 60 students. Taught ~2/3 of course, Lecture section.
Spring 2013, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 24 students. Lecture and Discussion. Taught ~80% of course.
Fall 2012. BIOEN 3202, *Physiology for Engineers,* 4 cr hr, 60 students. Taught ~2/3 of course, Lecture section.
Spring 2012, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 20 students. Lecture and Discussion. Taught ~80% of course.
Fall 2011. BIOEN 3202, *Physiology for Engineers,* 4 cr hr, 53 students. Taught ~59% of course, Lecture section.
Spring 2011, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 16 students. Lecture and Discussion. Taught ~80% of course.
Fall 2010. BIOEN 3202, *Physiology for Engineers,* 4 cr hr, 55 students. Taught ~59% of course, Lecture section.
Spring 2010, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 21 students. Lecture and Discussion. Taught ~80% of course.
Fall 2009. BIOEN 3202, *Physiology for Engineers,* 4 cr hr, 49 students. Taught ~2/3 of course. Lecture section.
Spring 2009, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 16 students. Lecture and Discussion. Taught ~3/4 of course.
Fall 2008. BIOEN 3202, *Physiology for Engineers,* 4 cr hr, 51 students. Taught ~2/3 of course. Lecture section.
Spring 2008, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 28 students. Lecture and Discussion. Taught ~3/4 of course.
Fall 2007, BIOEN 3202, BIOEN 3202, *Physiology for Engineers,* 4 cr hr, 34 students. Taught ~2/3 of course. Lecture section.
Spring 2007, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 24 students. Lecture and Discussion. Taught ~3/4 of course.
Fall 2006, BIOEN 3202, *Physiology for Engineers,* 4 cr hr, 47 students. Taught ~2/3 of course. Lecture section.
Spring 2006, BIOEN 3202, *Human Physiology II*, 4 cr hr, 24 students. Taught ~2/3 of course. Lecture section.
Spring 2006, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 11 students. Lecture and Discussion. Taught ~3/4 of course.
Spring 2005, BIOEN 3202, *Human Physiology II*, 4 cr hr, 44 students. Taught ~2/3 of course. Lecture section.
Spring 2005. BIOEN 3202-001, *Human Physiology II*. Laboratory section.
Spring 2005. BIOEN 3202-002, *Human Physiology II*. Laboratory section.
Spring 2005, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 11 students. Lecture and Discussion. Taught ~ 90% of course.

Spring 2004, BIOEN 3202-000, *Human Physiology II*, 4 cr hr, 44 students. Taught ~2/3 of course. Lecture section.
Spring 2004. BIOEN 3202-001, *Human Physiology II*. Laboratory section.
Spring 2004. BIOEN 3202-002, *Human Physiology II*. Laboratory section.
Spring 2004, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 14 students. Lecture and Discussion. Taught ~90% of course.
Spring 2003, BIOEN 3202-000, *Human Physiology II*, 4 cr hr, 38 students. Taught ~2/3 of course. Lecture section.
Spring 2003. BIOEN 3202-001, *Human Physiology II*. Laboratory section.
Spring 2003. BIOEN 3202-002, *Human Physiology II*. Laboratory section.
Spring 2003, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 14 students. Lecture and Discussion. Taught ~90% of course.
Fall 2002, BIOEN 3201-000, *Human Physiology I*, 4 cr hr, 43 students. Taught ~1/3 of course. Lecture section.
Fall 2002. BIOEN 3201-001, *Human Physiology I*. Laboratory section. Taught ~1/3 of course.
Fall 2002. BIOEN 3201-002, *Human Physiology I*. Laboratory section. Taught ~1/3 of course.
Fall 2002, BIOEN 5201, *Bioinstrumentation*, 4 cr hr, 39 students. Taught ~2/3 of lecture component of course.
Spring 2002, BIOEN 3201 *Human Physiology II*, 3 cr hr, 31 students. Taught ~2/3 of course.
Spring 2002, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 7 students.
Fall 2001, BIOEN 3201 *Human Physiology I*, 3 cr hr, 33 students. Taught ~1/3 of course.
Spring 2001, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 11 students.
Spring 2001, BIOEN 7155, *Neural Interfaces Laboratory,* 3 cr hr, 8 students.
Spring 2000, BIOEN 6430/NEUSC 6050, *Systems Neuroscience*, 4 cr hr, 7 students.
Spring 2000, BIOEN 7155, *Neural Interfaces Laboratory,* 3 cr hr, 8 students.
Spring 1999, BIOEN 6430-01/NEUSC 6050-01, *Systems Neuroscience*, 3 cr hr, 11 students.
Spring 1999, BIOEN 6900-02/NEUSC 6050-02, *Systems Neuroscience Discussion*, 1 cr hr, 10 students
Spring 1999, BIOEN 6900-01, *Neural Interfaces Laboratory*, 2 cr hr, 8 students.
Spring 1999, BIOEN 6010, *Principles of Physiology for Engineers II*, 4 cr hr, 28 students. Taught ~ 1/2 of course.
Spring 1998, BIOEN 695-04/NEUSC 605-01, *Integrative Neuroscience*, 3 cr hr, 12 students.
Spring 1998, BIOEN 695-05/NEUSC 603-01, *Current Issues in Neuroscience,* 1 cr hr, 10 students.
Spring 1998, BIOEN 558-01, *Scientific Presentations*, 1 cr hr, 16 students.
Winter 1998, BIOEN 562-01, *Principles of Physiology for Engineers II*, 3 cr hr, 19 students. Taught ~ 1/2 of course.
Fall 1997, BIOEN 595-02, *Biobased Engineering Seminar Series*, 1 cr hr, 7 students. Taught ~ 1/2 of course.
Winter 1997, BIOEN 562-01, *Principles of Physiology for Engineers II*, 3 cr hr, 18 students. Taught ~ 1/2 of course.
Winter 1997, BIOEN 565-01, *Applied Neurophysiology*, 3 cr hr, 4 students. Taught ~ 1/2 of course.

University of Utah Advising and Administrative Courses

Research advisor or Co-advisor to 24 different University of Utah graduate students since Fall 1996. Administrative responsibilities for research and research rotations as Curriculum Chair for Interdepartmental Neuroscience Program for 5-1/2 y.

??Update??
Spring 2020, BME 7970, Thesis Research—*Ph.D.*, 4 students
Spring 2020, NEUSC 6900-001, Laboratory, *Neuroscience Rotations*, 8 students. Administrative.
Spring 2020, NEUSC 6900-002, Laboratory, *Neuroscience Rotations*, 9 students. Administrative.
Spring 2020, NEUSC 7970, *Thesis Research—Ph.D.,* 26 students. Administrative.

Fall 2019, BME 7880, *TA Mentorship*, 5 students
Fall 2019, BME 7970, *Thesis Research—Ph.D.*, 4 students
Fall 2019, ME EN 5930 039. Independent Study, *Undergraduate Research,* 1 student

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Fall 2019, NEUSC 6900-001, Laboratory, *Neuroscience Rotations*, 9 students. Administrative.
Fall 2019, NEUSC 6900-002, Laboratory, *Neuroscience Rotations*, 8 students. Administrative.
Fall 2019. NEUSC 6010, *Frontiers in Neuroscience*. Seminar. 1 cr hr, 8 students. Administrative.
Fall 2019, NEUSC 7970, *Thesis Research—Ph.D.,* 28 students. Administrative.

Summer 2019, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Summer 2019, NEUSC 7970, *Thesis Research—Ph.D.*, 10 students. Administrative.

Spring 2019, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Spring 2019, NEUSC 6900, Laboratory, *Neuroscience Rotations*, 8 students. Administrative.
Spring 2019, NEUSC 7970, *Thesis Research—Ph.D.*, 25 students. Administrative.

Fall 2018, BIOEN 7970, *Thesis Research—Ph.D.*, 4 students
Spring 2018, BIOEN 7970, *Thesis Research—Ph.D.*, 4 students
Fall 2017, BIOEN 7970, *Thesis Research—Ph.D.*, 5 students
Spring 2017, BIOEN 7970, *Thesis Research—Ph.D.*, 5 students
Fall 2016, BIOEN 7970, *Thesis Research—Ph.D.*, 5 students
Spring 2016, BIOEN 7970, *Thesis Research—Ph.D.*, 4 students
Fall 2015, BIOEN 7970, *Thesis Research—Ph.D.*, 4 students
Spring 2015, BIOEN 7970, *Thesis Research—Ph.D.*, 4 students
Fall 2014, BIOEN 7970, *Thesis Research—Ph.D.*, 4 students
Spring 2014, BIOEN 7970, *Thesis Research—Ph.D.*, 4 students
Fall 2013, BIOEN 7970, *Thesis Research—Ph.D.*, 3 students
Fall 2013 BIOEN 6970, *Thesis Research—Masters*, 1 student
Spring 2013, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Spring 2013 BIOEN 6970, *Thesis Research—Masters*, 1 student
Spring 2013, CS 7970, *Thesis Research—Ph.D.*, 1 student
Fall 2012, BIOEN 7970, *Thesis Research—Ph.D.*, 3 students
Fall 2012 BIOEN 6970, *Thesis Research—Masters*, 1 student
Fall 2012, CS 7970, *Thesis Research—Ph.D.*, 1 student
Spring 2012, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Spring 2012, CS 7970, *Thesis Research—Ph.D.*, 1 student
Fall 2011, CS 7970, *Thesis Research—Ph.D.*, 1 student
Fall 2011 BIOEN 6970, *Thesis Research—Masters*, 1 student
Summer 2011, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Spring 2011, BIOEN 7970, *Thesis Research—Ph.D.*, 3 students
Spring 2011, CS 7970, *Thesis Research—Ph.D.*, 1 student
Spring 2011, BIOEN 6970, *Thesis Research—Masters*, 1 student
Fall 2010, BIOEN 7970, *Thesis Research—Ph.D.*, 3 students
Fall 2010, CS 7970, *Thesis Research—Ph.D.*, 1 student
Spring 2010, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Spring 2011, CS 7970, *Thesis Research—Ph.D.*, 1 student
Fall 2009, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Summer 2009, CS 7970, *Thesis Research—Ph.D.*, 1 student
Summer 2009, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Spring 2009, BIOEN 7970, *Thesis Research—Ph.D.*, 3 students
Spring 2009, CS 7970, *Thesis Research—Ph.D.*, 1 student
Fall 2008, BIOEN 7970, *Thesis Research—Ph.D.*, 3 students
Fall 2008, BIOEN 6970, *Thesis Research—Masters*, 2 students
Fall 2008, CS 7970, *Thesis Research—Ph.D.*, 1 student
Summer 2008, BIOEN 7970, *Thesis Research—Ph.D.*, 3 students
Summer 2008, BIOEN 6970, *Thesis Research—Masters*, 2 students
Spring 2008, BIOEN 7970, *Thesis Research—Ph.D.*, 3 students
Spring 2008, BIOEN 6970, *Thesis Research—Masters*, 2 students
Spring 2008, CPSC 7970, *Thesis Research—Ph.D.*, 1 student
Fall 2007, BIOEN 7970, *Thesis Research—Ph.D.*, 3 students

Fall 2007, BIOEN 6970, *Thesis Research—Masters*, 2 students
Fall 2007, CS 7970, *Thesis Research—Ph.D.*, 1 student
Summer 2007, BIOEN 7970, *Thesis Research—Ph.D.*, 3 students
Summer 2007, BIOEN 6970, *Thesis Research—Masters*, 2 students
Spring 2007, BIOEN 7970, *Thesis Research—Ph.D.*, 3 students
Spring 2007, BIOEN 6970, *Thesis Research—Masters*, 2 students
Spring 2007, CPSC 7970, *Thesis Research—Ph.D.*, 1 student
Fall 2006, BIOEN 7970, *Thesis Research—Ph.D.*, 4 students
Fall 2006, BIOEN 6970, *Thesis Research—Masters*, 2 students
Spring 2006, BIOEN 7970, *Thesis Research—Ph.D.*, 3 students
Fall 2005, BIOEN 7970, *Thesis Research—Ph.D.*, 4 students
Spring 2005, BIOEN 7970 et al., *Thesis Research—Ph.D.*, 4 students
Fall 2004, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Summer 2004, BIOEN 7970, *Thesis Research—Ph.D.*, 1 student
Spring 2004, BIOEN 7970, *Thesis Research—Ph.D.*, 1 student
Fall 2003, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Summer 2003, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Winter 2003, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Fall 2002, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Summer 2002, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Fall 2002, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Summer 2002, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Winter 2002, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Fall 2001, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Summer 2001, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Spring 2001, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Fall 2000, BIOEN 7970, *Thesis Research—Ph.D.*, 2 students
Summer 2000, BIOEN 7970, *Thesis Research—Ph.D.*, 3 students
Spring 2000, BIOEN 7970, *Thesis Research—Ph.D.*, 3 students
Fall 1999, BIOEN 7970, *Thesis Research—Ph.D.*, 3 students
Spring 1999, BIOEN 7970, *Thesis Research—Ph.D.*, 1 student
Spring 1999, BIOEN 6970, *Thesis Research*—M.S., 1 student
Fall 1998, BIOEN 7970, *Thesis Research—Ph.D.*, 1 student
Fall 1998, BIOEN 6970, *Thesis Research*—M.S., 1 student
Spring 1998, BIOEN 596-02, *Special Project*, 1 student
Spring 1998, BIOEN 697-16, *Thesis Research*, M.S., 1 student
Winter 1988, BIOEN 697-15, *Thesis Research*, M.S.,1 student

University of Utah Guest Lectures/Instruction
Guest instructor in >20 University of Utah courses since Fall 1996

Spring, 2024. BME 3091, *Current Research in Bioengineering*
Fall 2019, BME 7870, *Neural Engineering Research Group*
Fall 2019, BME 3091, *Current Research in Bioengineering*
Fall 2019, BME 1010, *Careers in Bioengineering*
Spring 2019, BIOEN 5460, *Engineering Aspects of Clinical Medicine.*
Fall 2018, BIOEN 7870, *Neural Engineering Research Group*
Fall 2018, BIOEN 3091, *Current Research in Bioengineering*
Fall 2018 BIOEN 1010, *Careers in Bioengineering*
Spring 2018, Osher Lecture Series
Fall 2017, BIOEN 7870, *Neural Engineering Research Group*
Fall 2017, BIOEN 3091, *Current Research in Bioengineering*
Fall 2017 BIOEN 1010, *Careers in Bioengineering*
Spring 2006, BIOEN 3801, *Biomedical Engineering Design I*
Fall 2005, PHYSI 6070, *Systemic Physiology* (2 lectures)
Fall 2004, PHYSI 6070, *Systemic Physiology* (2 lectures)

Fall 2003, PHYSI 6070, *Systemic Physiology* (2 lectures)
Fall 2002, PHYSI 6070, *Systemic Physiology*
Fall 2001, PHYSI 6070, *Systemic Physiology*
Fall 2000, PHYSI 6070, *Systemic Physiology*
Fall 2000, BIOEN 6090, *Bioengineering Seminar Series*
Fall 1999, BIOEN 6060, *Scientific Presentations*
Winter 1998, BIOEN 557-01, *Scientific Presentations*
Fall 1998 BIOEN 6090, *Bioengineering Seminar Series*
Winter 1997, PSYCH 786-01, *Topics in Neurobiology of Learning and Memory*
Fall 1996, BIOEN 596-02, *Biobased Engineering Seminar Series*
Fall 1996, NEUSC 601-01, *Frontiers in Neuroscience*

Princeton University Courses
Instructor or co-instructor in 25 undergraduate or graduate courses (9 different courses), 1989-1996

1989-1996, Instructor, *Reward, Punishment and Behavior*, undergraduate course
1996, Co-Instructor, *Topics in Neuroscience and Behavior*, graduate course
1995, Co-Instructor, *Introduction to Neuroscience*, graduate course
1989-1995, Co-Instructor, *Proseminar in Basic Problems in Psychology*, graduate course
1989, 1994, Instructor, *Current Issues in Neuroscience and Behavior*, graduate seminar
1993, Co-Instructor, *Methods in Neuroscience*, graduate laboratory course
1993, Co-Instructor, *Experimental Psychopathology*, undergraduate course
1990, 1992, 1993, Co-Instructor, *Structure and Ethical Demands in Academic Psychology*, graduate course
1991, 1992, Instructor, *Mechanisms of Neuronal Plasticity*, graduate seminar

Selected Other Early Teaching Experience
1992, Invited Lecturer, *Scandinavian Learning Course*, graduate and postgraduate course, Sandbjerg, Denmark, 1992
1987, 1991, Invited Lecturer, *Cellular and Molecular Biology of Learning and Memory*, graduate and postgraduate course, Cold Spring Harbor Laboratories, 1987, 1991
1987, Instructor, *Neurobiology of Learning and Memory*, graduate student seminar, Center for Neurobiology and Behavior, Columbia University, College of Physicians and Surgeons, 1987
1981, Lecturer, *Drugs and Behavior*, undergraduate lecture course, Department of Psychology, Stanford University, 1981
1981, Lecturer, *Introduction to the Nervous System*, undergraduate lecture course, Department of Psychology, Stanford University, 1981
1976-1980, Teaching Assistant and Neurophysiology Committee Chair (1978-1978), *Psychobiology Methods Laboratory*, Department of Psychobiology, University of California, Irvine, 1976-1980

2. Development of New University of Utah Courses
Developed 8 new courses at University of Utah since Fall 1996

Spring 1998, BIOEN 695-04/NEUSC 605-01, *Integrative Neuroscience* (became BIOEN 6430/NEUSC 6050-01, *Systems Neuroscience,* in 1999)

Lecture. Considers systems-level functions and dysfunctions of the nervous system, including sensory coding and motor control, homeostasis, arousal, cognitive and mood disorders, experience-dependent modifications, and recording, stimulation, and imaging techniques. Developed *de novo*.

Spring 1998, BIOEN 695-05/NEUSC 603-01, *Current Issues in Neuroscience* (became BIOEN 6900-02/NEUSC 6050-02, *Systems Neuroscience Discussion*, in 1999; Joined *with Systems Neuroscience* to become BIOEN 6430/NEUSC 6050-01, *Systems Neuroscience,* in 2000)

Seminar. Student presentations and discussion of primary scientific/engineering literature associated with topics covered in BIOEN 6430/NEUSC 6050-01, *Systems Neuroscience*. Developed *de novo*.

Spring 1999, BIOEN 6010, Physiology for Engineers II
Lecture. Fundamental concepts and quantitative analysis of the structure and function of the nervous, cardiovascular, respiratory, excretory, gastrointestinal, and endocrine systems. The course stresses engineering, design, and control principles where appropriate. The course was substantially redesigned with the transition to the semester system, in conjunction with other Bioengineering faculty.

Spring 1999, BIOEN 7155, *Neural Interfaces Laboratory* (first offered as BIOEN 6900)
Laboratory. Engineering and utilization of neural interfaces. Techniques/topics covered include electrophysiological stimulation and recording of neural tissue (including intracellular, intracranial, and nerve), *in vivo* cell or drug delivery systems, animal surgery (chronic and acute), neuroanatomy, neuronal histology, neuronal cell culture. Syllabus submitted as part of Whitaker Extension Award Proposal (funded) for laboratory equipment. Developed *de novo*.

Fall-Spring 2001-2002, BIOEN 3201,3202, *Physiology I,II (presently lectures section BME 3202-001, Physiology for Engineers)*
Lecture. In conjunction with other Bioengineering faculty, I developed and implemented (Fall-Spring, 2001-2002) undergraduate Bioengineering courses for recently approved Undergraduate Program in Bioengineering. I provided primary contribution for approximately one-half of the course material for the two semesters.

Spring 2002, BIOEN 3102, *Bioengineering Laboratory II (presently laboratory sections for BME 3202-00x, Physiology for Engineers)*
Laboratory. In conjunction with other Bioengineering faculty, I substantively developed and provided laboratory manual for approximately one-half the experimental modules for the two semesters, covering much of the neurophysiology section of the course. First offered Spring 2002.

3. Teaching Awards

Dean's Selection as a Top Graduate Teacher (Lectures), College of Engineering, University of Utah, 2014
Dean's Selection as a Top Graduate Teacher (Lectures), College of Engineering, University of Utah, 2013
Dean's Selection as a Top Undergraduate Teacher (Labs, Discussions, Seminars), College of Engineering, University of Utah, 2012
Deans' Letter of Commendation, Teaching, College of Engineering, University of Utah, 2011
Deans' Letter of Commendation, Teaching, College of Engineering, University of Utah, 2008
Deans' Deans' Letter of Commendation, Teaching, College of Engineering, University of Utah, 2002
Deans' Letter of Commendation, Teaching, College of Engineering, University of Utah, 2000
Edward G. Steinhaus Graduate Student Teaching Award, University of California, Irvine, 1979

4. Graduate Students Supervised (Primary Advisor)

University of Utah

Primary Advisor or Co-advisor to 25 graduate students since Fall 1996; graduated 10 University of Utah Ph.D.'s and 4 Masters of Science, 1 Masters of Engineering.

Present Graduate Students

- Troy Tully, University of Utah, Biomedical Engineering (9/2020-present)
- Eric Stone, University of Utah, Biomedical Engineering (9/2019-12/2022)
- David Hilgart, University of Utah, Bioengineering (9/2011-present)

- Also: Basic Science Mentor to Nicholas Witham, Univ. of Utah, BME (7/2020-)
  Graduate Awards: 2020 NINDS T32 Predoctoral Training Fellowship (F. Solzbacher, PI/ Translational Science Mentor)

Previous Graduate Students

- Michael Paskett, University of Utah, Bioengineering (9/2017-12/2021)

Graduate Awards: Spheres of Translation Across the Research Spectrum (STARS) TL1 predoctoral training fellowship, Utah Center for Clinical and Translational Science, 2020; NIH F31 Predoctoral Fellowship (9/2020-8/2022), *Society for Neuroscience Professional Development Award, Nov 2020.*

Jacob George, University of Utah, Bioengineering (9/2016-6/2020). Oral Ph.D. Defense, Spring 2020; final dissertation, Spring, 2020. *Recreating the human hand: Restoring dexterous motor control and biomimetic sensory feedback to human amputees.* Subsequent positions (2020-): Post-doctoral Fellow, University of Utah; Asst. Prof., ECE and PM&R, Univ. of Utah.
Graduate Awards: BME Dept. Outstanding Dissertation Award, 2021; EMBS 1st-place Student Paper Competition award, 2020; Finalist, Promising Young Investigator Award, Ripple Neuro LLC, Oct. 2019; Utah Associated Students Travel Award, 2019; University Candidate, NIH Director's Early Independence Award, Finalist, Univ. Utah, Fall 2019; 1st-place, student podium presentation, Utah Bioengineering Conference, December 2017; Graduate Student Travel Assistance, 2017; NSF Predoctoral Fellowship, 2017-2020; Trainee Professional Development Award, Society for Neuroscience, Nov. 2017; Panelist, Press Conference, Society for Neuroscience, Nov. 2017; Society for Neuroscience Travel Grant, 2017; 3rd-place, student podium presentation, Utah Bioengineering Conference, December 2016; Don B. Olsen Graduate Fellowship, 2016-2017.

David Kluger, University of Utah, Biomedical Engineering (2012-2019). Oral Ph.D. Defense, Fall 2018; final dissertation, Spring, 2019. *Using Utah slanted electrode arrays for treatment of peripheral nerve neuropathy and for closed-loop control of prosthetic limbs.* Subsequent position: Biomedical industry, Blackrock Microsystems.

Suzanne Wendelken, University of Utah, Bioengineering, (2013-2018). Oral Ph.D. Defense, Summer 2017; final dissertation, Fall 2017. *Dexterous control of a hand prosthesis using neuromuscular signals from implanted or surface electrodes.* Subsequent position: Univ. of Utah Medical School.
Graduate Awards: University of Utah College of Engineering Outstanding Dissertation Award, 2018.

David Page, University of Utah, Bioengineering (2012- 2017). Oral Ph.D. Defense, Fall 2016; final dissertation, Spring 2017. *Restored hand sensation in human amputees via Utah slanted electrode array stimulation enables performance of functional tasks and meaningful prosthesis embodiment.* Subsequent position: Biomedical industry, Halyard Health.

Rudy Wilcox, University of Utah, Bioengineering.

Andrew Wilder, University of Utah, Computer Science (2005-2014). Oral Ph.D. Defense, Fall 2013; final dissertation, Spring 2014. *Computer-aided Approaches to Intrafascicular Multi-Electrode Stimulation.* Subsequent position: Biomedical industry, Ripple, LLC.

Salil Pendse, University of Utah, Bioengineering (2010-Spring 2013). Masters. Co-advised with Alessandra Angellucci. A *Flexible and Scalable Network Architecture for the Study of Surround Supression in Macaque Visual Cortex.* Subsequent position: Biomedical industry.

Noah Ledbetter, University of Utah, Bioengineering (2005-2012). Ph.D. *Unit Recording and Muscle Activation in Peripheral Nerves for Improved Neuroprostheses.* Spring 2013. Subsequent position: Post-doctoral fellow, Univ. of Washington at St. Louis.

Brett Dowden, University of Utah, Bioengineering (2004-2012). Ph.D., Spring 2012. *Intrafascicular Stimulation Strategies for Neuroprosthetic Applications.* Subsequent position: Biomedical industry (Blackrock Microsystems, Inc.)
Graduate Awards: Student podium presentation at the Utah Bioengineering Conference, ~2011

Kristina Grimm. University of Utah, Bioengineering (Fall 2010-Fall 2011; Course Masters).

Silvana Schister, University of Utah, Bioengineering (Fall 2010-Spring 2011). Subsequent position: Continuation as Ph.D. candidate, Univ. of Utah.

Kabilar Gunalan, University of Utah, Bioengineering (Fall 2006-Summer 2010; with Richard Normann). Masters of Science, Summer 2010. *An Automated System for Measuring Tip Impedance and Among-Electrode Shunting in High-Density Microelectrode Arrays.*

William Nesse, University of Utah (2005-2008; with P. Bressloff). Ph.D., Mathematics, 2008. Co-advised with P. Bressloff. Subsequent Position: Post-doctoral fellow.

Sarah (Davis) Towns, University of Utah (Fall 2006 to Spring 2009). Masters of Science, Spring 2009. *Fast, Quantitative Assay of Nerve Somatotopy Via Recording Stimulus-Evoked Compound Action Potentials with the Utah Slanted Electrode Array.*
Graduate Awards: Neural Interface Conference Travel Award, June 2008.

Justin Perry, University of Utah (Summer 2006 to Fall 2008). Masters of Science, Fall 2008. *Verification, Electrode Activation, and Electrical Testing of High-Channel Count Microelectrode Arrays.* Subsequent positions: Biomedical industry.

Christopher R. Butson, University of Utah (1998-2006); with C. Johnson. Ph.D. in Bioengineering, 2006; *Insights from computational neuroscience: exploring temporal and spatial domains.*
Graduate Awards: Whitaker Fellowship (1998-1999, 1999-2000).
Subsequent Positions: Postdoctoral fellow; faculty, Univ. of Wisconsin; faculty, Univ. of Utah (present)

Daniel McDonnall, University of Utah (2004-2005; with R. Normann). Ph.D. in Bioengineering, 2005. *Interleaved Multielectrode Stimulation Enhances Fatigue Resistance.* Co-advised with R. A. Normann. Subsequent positions: Ripple, LLC (Biomedical industry).

Xin Guan, University of Utah (1998-2004). Ph.D. in Bioengineering, 2004; *Essential role of somatic and synaptic protein synthesis and axonal transport in long-term facilitation at distal sensorimotor connections in* Aplysia californica.
Graduate Awards: Whitaker Fellowship (1998-1999, 1999-2000); First place, Bioengineering Department Annual Poster Contest, 1998

Scott Brown, University of Utah (Advised: 1999-2000).
Graduate Awards: Whitaker Fellowship (1999-2000)

Roy M. Smeal, University of Utah (Advised 1998-1999); Ph.D. in Bioengineering, 2004 (with other BME faculty).
Graduate Awards: Whitaker Fellowship (1997-1998, 1998-1999)

Princeton University
Graduated 4 Masters students and 5 Ph.D. students, 1988-1997

Laura M. Schultz, Princeton University (1993-1997)
Masters in Psychology and Neuroscience, 1995; *GABA-Induced Facilitation at Type B to A Photoreceptor Synapses in Hermissenda crassicornis*
Ph.D. in Psychology and Neuroscience, 1997; *Nonassociative Synaptic Plasticity at Type B to A Photoreceptor Connections in Hermissenda*
Graduate Awards: NSF Predoctoral Fellowship, 1993-1997
Subsequent positions: Postdoctoral Fellow, Computational Neurobiology Laboratory, The Salk Institute for Biological Studies; Visiting Asst. Professor, Swarthmore College

Cynthia M. Gooch, Princeton University (1993-1997)
Masters in Psychology and Neuroscience, 1995; *Preliminary Evidence for Synapse-Specific Long-Term Facilitation in Aplysia LE Sensory Neurons*
Ph.D. in Psychology and Neuroscience, 1997; *Synapse-Specific Heterosynaptic Long-Term Facilitation at Aplysia Sensorimotor Connections*

Joshua W. Fost, Princeton University (1991-1996)
Masters in Psychology and Neuroscience, 1993; *Contributions of K^+ currents to Hermissenda Type-B Photoreceptor Response*
Ph.D. in Psychology and Neuroscience, 1996; *Computational and Physiological Analysis of Neural Plasticity in Hermissenda: From Potassium Currents to Network Architecture*
Graduate Awards: Office of Naval Research Predoctoral Fellowship (1991-1995), Charlotte Elizabeth Procter Honorific Fellowship (1995-1996)
Subsequent positions: Postdoctoral Fellow, Volen Center for Complex Systems, Brandeis University; Senior Consultant, Thomson Consulting

Xue Fang, Princeton University (1988-1995)
Masters in Psychology and Neuroscience, 1990; *Differential Effects of Tail and Mantle Nerve Shock on the Neuronal Circuit for the Siphon-Withdrawal Response in Aplysia californica*.
Ph.D. in Psychology and Neuroscience, 1995; *Neural Mechanisms for Behavioral Response Specificity in the Siphon-Withdrawal Response of Aplysia*
Subsequent positions: Columbia University School of Public Health

Erin M. Schuman, Princeton University (1989-1990)
Ph.D. in Psychology and Neuroscience, 1990; *The Essential Role of Protein Kinase C in the Production of Short- and Long-Term Associative Cellular Memories in Hermissenda Type B Photoreceptors*
Postdoctoral Fellow, Princeton University, 1990
Subsequent positions: Postdoctoral Fellow, Dept. Molecular and Cellular Physiology, Stanford University; Assistant/Associate Professor and Howard Hughes Medical Investigator, Biology Dept., California Institute of Technology

5. Undergraduate Students Supervised (Primary Faculty Advisor)
University of Utah

Recent undergraduate students and projects in the Center for Neural Interfaces
(*co-author abstract, #first-author abstract, †competitive fellowship (e.g., Undergraduate Research Opportunity Program), ‡competitive award (e.g., 1st-place podium presentation), ᵗco-author manuscript, §first-author manuscript, %Honors thesis). Note: Indicated graduate students and postdoctoral trainees working with me in recent years undergo formal training to be undergraduate mentors or co-mentors.

12/2021-2022	Amelia Nelson† w/ T. Tully, C. Thomson (graduate students), J. George (faculty) "Optimizing Motor Decode Performance by Varying the Moving Average Window Duration." UROP funding.
1/2022-12/2022	Elizabeth (Lia) Westermann, w/ T. Tully (graduate student) "Optimizing Motor Decode Performance by Varying the Moving Average Window Duration"
1/2019-5/2022	Sonny Jones††† (BME); w/ M. Paskett "Quantifying Cognitive Workload during Advanced Prosthesis Use with Electrocardiographic Measures" "Development Of Electrocardiographic Measures For Cognitive Load During Prothesis Use" (Undergraduate Research Journal, June 2022)
1/2019-12/2021	Jhorg Garcia†† (BME) w/ M. Paskett "Quantifying Cognitive Workload during Advanced Prosthesis Use with Electroencephalographic Measures." NSF project 58502807..

1/2019-5/2021	Gursirat Grewal[†%] (BME); w/ E. Stone "EMG electrode placement and fatigue correction for improved upper-limb prosthesis control Honors Thesis"
9/2020-5/2021	Evan Colt (Freshman, UU Honors College); w/ E. Stone CNI website
1/2020-10/2020	Aidan Lethaby[††] (CS); w/ J. George "Functional assessment of low-cost control system for myoelectric prostheses"
2019-10/2020	Abigail Citterman (BME); w/ M. Brinton & J. George "Compliance Discrimination through Sensory Feedback"
2019-8/2020	Rebecca Urban (BME); w M. Brinton & J. George "Transcutaneous stimulation for improved activities-of-daily-living (ADLs)"
9/2019-8/2020	Skylar Stockham (EE); w/ J. George "Electrically isolated transcutaneous stimulator for closed-loop control of sensorized prostheses"
2019-5/2020	Alan Jenkins[†] (BME); w/ M. Paskett "Digital Manipulandum for Prosthesis Evaluation"
2019-8/2020	Troy N. Tully[#tt] (CS – Westminster); w/ J. George "Improved training data for non-linear myoelectric prosthetic control algorithms"
2019-5/2020	Spencer C. Iverson[**#††‡‡] (ME); w/ J. George & M. Brinton "Wireless wearable electrographic recording device"
2019-2020	Spencer Durrant* (CE) "Shared human-machine control for self-aware bionic arms" "Graphical User Interface to Control a Bionic Arm"
2017-5/2020	Sri Radhakrishnan[*###†‡‡t%] (BME); w/ J. George "Low-cost control system for myoelectric prostheses"
2017-2/2020	Paul C. Colgan[**#††tt] (BME) w/ J. George and M. Brinton "Development of a motion-tracking data glove for applications in upper-limb rehabilitation" "Discriminability of transcutaneous electrical nerve stimulation" "3D printed carrying case for a portable bionic arm processor
2016-5/2020	Nathan R. Olsen[*##††‡t§] (BME) "3D-printed, lightweight, inexpensive, and adaptable prosthetic wrist"
2019	Josh Conant (CS – self-employed) w. J. George Smartphone processing of electromyographic data"
2019	David R. Taylor (BME); w/ J. George "Development of a low-cost 3D-printed orthosis"
2016-2019	Anna N. Harding[****#††‡t%] (BME) "Optimal electrode placement for high-density electromyographic prosthesis control algorithms" "Low-cost surface electromyography sleeve for quick and repeatable decoding of motor intent" "Impact of neural stimulation on electrode degradation and phantom pain"
2016-2018	Garrison Colvin[*††t] (BME) "Transcutaneous stimulator for noninvasive sensory feedback from prostheses" "Electrical activation of isolated cutaneous mechanoreceptors"

2020: 15 undergraduate students. Nathan R. Olsen[*##††‡t§], Paul C. Colgan[**#††tt], Sri Radhakrishnan[###††‡‡t%]; Spencer Durrant*, Spencer C. Iverson[**#††], Troy N. Tully[#tt], Alan Jenkins, Sonny Jones[†], Skylar Stockham, Rebecca Urban, Abigail Citterman, Jhorg Garcia[†], Gursirat Grewal[†], Aiden Lethaby[††], Evan Colt

2019: 13 undergraduate students. Spencer Durrant*, Troy N. Tully#♦, Spencer C. Iverson**#†; Sri Radhakrishnan###††; Paul C. Colgan**#††, Nathan R. Olsen*##†♦□, David R. Taylor, Josh Conant, Anna N. Harding*****#††, Sonny Jones, Gursirat Grewal, Abigail Citterman, Alan Jenkins

2018: 7 undergraduate students. Paul Colgan#†, Garrison Colvin*†, Anna (Neibling) Harding***#†, Spencer Iverson**†, Nathanial Olsen**#†♦, Sridharan Radhakrishnan#†

2017: 6 undergraduate students. Paul Colgan#†, Garrison Colvin*†, Anna (Neibling) Harding†, Nathanial Olsen#†, Sridharan Radhakrishnan†

Selected students (12) in previous years: Anna Neibling (2016-2019); Shauna Byers (2016); Kacey Gao (2014-2016); Jacob George (2015; Summer Undergraduate Research Program student); Brady Houston (2010-2012), Laura Tatham (ACCESS Program for Women in Science and Mathematics, 2010; 2010-2012), Taylor Scheinblum (2012) Jacob Campbell (Summer Undergraduate Research Program, 2011), Creighton Petty (2009-2010), Anh Lam (2009-2010), William Podlaski (Summer Undergraduate Research Program, 2010), Michael Legge (2004-2006).

Princeton University

Undergraduate Advisor for Junior Independent Work and Senior Thesis, 1988-1996, approximately 2-3 Juniors and 2-3 Seniors per year, including:

Diana Johanson, Junior Independent Work, 1994: Recipient, Howard Warren Crosby Junior Prize (Princeton University) as the outstanding Junior concentrator in Psychology.

Jason Cooper, Senior Thesis, 1993: Co-recipient, Marilyn Shaw Award (from Psychology Department, Rutgers University), given to "the graduating senior with the most outstanding promise in research." (Thesis research conducted in Clark Laboratory at Princeton University in conjunction with Princeton University-Rutgers University/UMDNJ Neuroscience Consortium.)

6. Additional Student Advising

University of Utah Masters/Ph.D. Supervisory Committees

Since 1996, Committee member for a total of ~64 University of Utah graduate students (including ~47 Bioengineering or Biomedical Engineering, 7 Electrical & Computer Engineering, 1 Exercise & Sports Science, 2 Mathematics, 1 Mechanical Engineering, 3 Neuroscience, 1 Computer Science, 1 Speech-Language Pathology).

2023 calendar year (16 students)

Primary advisor (3 students): David Hilgart (Ph.D., Biomedical Engineering), Troy Tully (Ph.D., Biomedical Engineering (9/2020-) *Basic science advisor:* NINDS T32 predoctoral fellowship, Nicholas Witham (Ph.D., Biomedical Engineering)

Supervisory committee member (13 students): Rahul Cheeniyil, (Ph.D., Biomedical Engineering, 6/2021-), Phillip Comeaux (Ph.D., Biomedical Engineering, 5/2021-), Don Cundy (Ph.D., Biomedical Engineering), Brian Phillip (Ph.D., Biomedical Engineering), Samantha Steyl (Ph.D., Biomedical Engineering, 5/2021-present), Mitchell Thomas (Ph.D., Biomedical Engineering, -12/2023), Kyle O'Sullivan (Ph.D., Biomedical Engineering), Caleb Thompson (Ph.D., Biomedical Engineering, 4/2021-present); Geyu ("Bekka") Weng (Ph.D., Biomedical Engineering, 6/2021- present), Hannah Khelfa (M.S., 7/2021- present), Monica Buczak (Ph.D., Biomedical Engineering, 1/2023-present), Connor Olsen (Electrical & Computer Engineering, 5/2023-present)

2022 calendar year (18 students)

Primary advisor (4 students): David Hilgart (Ph.D., Biomedical Engineering), Eric Stone (Biomedical Engineering (9/2019-12/2022), Troy Tully (Biomedical Engineering (9/2020-)

Basic science advisor: NINDS T32 predoctoral fellowship, Nicholas Witham (Ph.D., Biomedical Engineering)

Supervisory committee member (14 students): Rahul Cheeniyil, (Ph.D., Biomedical Engineering, 6/2021-), Phillip Comeaux (Ph.D., Biomedical Engineering, 5/2021-), Don Cundy (Ph.D., Biomedical Engineering), Taylor Hansen (Ph.D., Biomedical Engineering, -8/2022), Brian Phillip (Ph.D., Biomedical Engineering), Samantha Steyl (Ph.D., Biomedical Engineering, 5/2021-), Maya Stevens (Ph.D., Speech-Language Pathology, Audiology), Mitchell Thomas (Ph.D., Biomedical Engineering), Kyle O'Sullivan (Ph.D., Biomedical Engineering); Carena Cornelssen (Ph.D., Biomedical Engineering -4/2022), Caleb Thompson (Ph.D., Biomedical Engineering, 4/2021-); Geyu ("Bekka") Weng (Ph.D., Biomedical Engineering, 6/2021-), Hannah Khelfa (M.S., 7/2021-)

2021 calendar year (18 students)

Primary advisor (4 students): David Hilgart (Ph.D., Biomedical Engineering), Michael Paskett (Ph.D., Biomedical Engineering), Eric Stone (Biomedical Engineering (9/2019-), Troy Tully (Biomedical Engineering (9/2020-)

Basic science advisor: NINDS T32 predoctoral fellowship, Nicholas Witham (Ph.D., Biomedical Engineering)

Supervisory committee member (13 students): Rahul Cheeniyil, (Ph.D., Biomedical Engineering, 6/2021-), Phillip Comeaux (Ph.D., Biomedical Engineering, 5/2021-), Don Cundy (Ph.D., Biomedical Engineering), Taylor Hansen (Ph.D., Biomedical Engineering), Brian Phillip (Ph.D., Biomedical Engineering), Samantha Steyl (Ph.D., Biomedical Engineering, 5/2021-), Maya Stevens (Ph.D., Speech-Language Pathology, Audiology), Mitchell Thomas (Ph.D., Biomedical Engineering), Kyle O'Sullivan (Ph.D., Biomedical Engineering); Carena Cornelssen (Ph.D., Biomedical Engineering), Caleb Thompson (Ph.D., Biomedical Engineering, 4/2021-), Geyu ("Bekka") Weng (Ph.D., Biomedical Engineering, 6/2021-), Hannah Khelfa (M.S., 7/2021-)

2020 calendar year (19 students)

Primary advisor (5 students): David Hilgart (Ph.D., Biomedical Engineering), Michael Paskett (Ph.D., Biomedical Engineering), Jacob George (Ph.D July 31, 2020, Biomedical Engineering), Eric Stone (Biomedical Engineering), Troy Tully (Biomedical Engineering (9/2020-)

Basic science advisor: NINDS T32 predoctoral fellowship, Nicholas Witham (Ph.D., Biomedical Engineering)

Other committee chair (1 student): Gabrielle Hoyer, M.S., Biomedical Engineering).

Supervisory committee member (11 students): Don Cundy (Ph.D., Biomedical Engineering); Brett Davis (Ph.D., Biomedical Engineering), Taylor Hansen (Ph.D., Biomedical Engineering), Brian Phillip (Ph.D., Biomedical Engineering), Katherine Warthen (Ph.D., Biomedical Engineering, Summer 2020); Maya Stevens (Ph.D., Speech-Language Pathology, Audiology), Hunter Stratham (Ph.D., Biomedical Engineering; advising till 2/2020), Mitchell Thomas (Ph.D., Biomedical Engineering), Kenneth Hubbard (Masters, Biomedical Engineering, Spring 2020), Kyle O'Sullivan (Ph.D., Biomedical Engineering); Carena Cornelssen (Ph.D., Biomedical Engineering)

2019 calendar year (16 students)

Primary advisor (5 students): David Hilgart (Ph.D., Biomedical Engineering), David Kluger (Ph.D. 2019, Biomedical Engineering), Michael Paskett (Ph.D., Biomedical Engineering), Jacob George (Ph.D., Biomedical Engineering), Eric Stone (Biomedical Engineering).

Other committee chair (1 student): Gabrielle Hoyer, M.S., Biomedical Engineering).

Supervisory committee member (10 students): Don Cundy (Ph.D., Biomedical Engineering); Brett Davis (Ph.D., Biomedical Engineering), Brian Phillip (Ph.D., Biomedical Engineering), Katherine Warthen (Ph.D., Biomedical Engineering); Maya Stevens (Ph.D., Speech-Language Pathology, Audiology); Hunter Stratham, (Ph.D., Biomedical Engineering), Mitchell Thomas (Ph.D., Biomedical Engineering), Kenneth Hubbard (Masters, Biomedical Engineering), Kyle O'Sullivan (Ph.D., Biomedical Engineering)

2018 calendar year

Primary advisor: David Hilgart (Ph.D., Biomedical Engineering), David Kluger (Ph.D. 2019, Biomedical Engineering), Michael Paskett (Ph.D., Biomedical Engineering), Jacob George (Ph.D., Biomedical Engineering).

Other committee chair: Gabrielle Hoyer, M.S., Biomedical Engineering).

Supervisory committee member: Brett Davis (Ph.D., Biomedical Engineering), Jace King (Ph.D. 2018, Neuroscience), Katherine Lambert (Ph.D. 2018, Biomedical Engineering), Robert Moesinger (M.S. 2018, Biomedical Engineering), Brian Phillip (Ph.D., Biomedical Engineering), Katherine Warthen (Ph.D., Biomedical Engineering); Hunter Stratham, (Ph.D., Biomedical Engineering).

2017 calendar year: *Primary advisor or committee chair:* David Hilgart (Ph.D., Bioengineering; primary advisor), David Kluger (Ph.D., Bioengineering, primary advisor), David Page (Ph.D. Bioengineering, primary advisor), Suzanne Wendelken (Ph.D., Bioengineering, primary advisor), Michael Paskett (Ph.D., Bioengineering, primary advisor), Jacob George (Ph.D., Bioengineering, primary advisor). *Supervisory committee member:* Ronald Boutte (Ph.D., Electrical and Computer Engineering), Daniel Epstein (Ph.D., Neuroscience), Jordan Peterson (M.S., Bioengineering), Brett Davis (Ph.D., Bioengineering), Jace King (Ph.D., Neuroscience); Katherine Lambert (Ph.D., Biomedical Engineering); Robert Moesinger (M.S., Bioengineering).

2016 calendar year: David Hilgart (Ph.D., Bioengineering; primary advisor), David Kluger (Ph.D., Bioengineering, primary advisor), David Page (Ph.D. Bioengineering, primary advisor), Suzanne Wendelken (Ph.D., Bioengineering, primary advisor), Jacob George (PhD., Bioengineering, primary advisor), Rudy Wilcox (M.S., Bioengineering, primary advisor), Ronald Boutte (Ph.D., Electrical and Computer Engineering), Daniel Epstein (Neuroscience), Shane Guillory (Ph.D., Bioengineering), Katherine Lambert (Ph.D., Biomedical Engineering), Jordan Peterson (Bioengineering), Brett Davis (Ph.D., Bioengineering), Jace King (Neuroscience).

2015 calendar year: David Hilgart (Ph.D., Bioengineering; primary advisor), Andrew Wilder (Ph.D, Computer Science, primary advisor), David Kluger (Ph.D., Bioengineering, primary advisor), David Page (Ph.D. Bioengineering, primary advisor), Suzanne Wendelken (Ph.D., Bioengineering, primary advisor), Rudy Wilcox (M.S., Bioengineering, primary advisor), Ronald Boutte (Ph.D., Electrical and Computer Engineering), Jordan Cline (Electrical & Computer Engineering) Daniel Epstein (Neuroscience), Shane Guillory (Ph.D., Bioengineering), Jordan Peterson (Bioengineering), Andrew Willsie (Ph.D., Bioengineering).

2014 calendar year: David Hilgart (Ph.D., Bioengineering; primary advisor), Andrew Wilder (Ph.D, Computer Science, primary advisor), David Kluger (Ph.D., Bioengineering, primary advisor), David Page (Ph.D. Bioengineering, primary advisor), Salil Pendse (M.S., Bioengineering, primary advisor), Suzanne Wendelken (Ph.D., Bioengineering, primary advisor), Rudy Wilcox (M.S., Bioengineering, primary advisor), Ronald Boutte (Ph.D., Electrical and Computer Engineering), Daniel Epstein (Neuroscience), Mitch Frankel (Ph.D., Mechanical Engineering), Shane Guillory (Ph.D., Bioengineering), Kiran Mathews, (M.S., Bioengineering), Nic Roehner (Ph.D., Bioengineering), Jessica Smith (Ph.D., Bioengineering), Kyle Thompson (Ph.D., Bioengineering), Ching Wang (Ph.D., Bioengineering), Andrew Willsie (Ph.D., Bioengineering).

2013 calendar year: David Hilgart (Ph.D., Bioengineering; primary advisor), Noah Ledbetter (Ph.D., Bioengineering, primary advisor), Andrew Wilder (Ph.D, Computer Science, primary advisor), David Kluger (Ph.D., Bioengineering, primary advisor), David Page (Ph.D. Bioengineering, primary advisor), Salil Pendse (M.S., Bioengineering, primary advisor), Rudy Wilcox (M.S., Bioengineering, primary advisor), Suzanne Wendelken (Ph.D., Bioengineering, primary advisor), Tanya Abaya (Ph.D., Electrical and Computer Engineering), Rajmohan Bhandari (Ph.D., Electrical and Computer Engineering), Ronald Boutte (Ph.D., Electrical and Computer Engineering), Daniel Epstein (Neuroscience), Mitch Frankel (Ph.D., Mechanical Engineering), Shane Guillory (Ph.D., Bioengineering), Kiran Mathews, (M.S., Bioengineering), Nic Roehner (Ph.D., Bioengineering), Jessica Smith (Ph.D., Bioengineering), Kyle Thompson (Ph.D., Bioengineering), Ching Wang (Ph.D., Bioengineering), Andrew Willsie (Ph.D., Bioengineering).

2012-2013: David Hilgart (Ph.D., Bioengineering; primary advisor), Noah Ledbetter (Ph.D., Bioengineering, primary advisor), Andrew Wilder (Ph.D, Computer Science, primary advisor), David Kluger (Ph.D., Bioengineering, primary advisor), David Page (Masters, Bioengineering, primary advisor), Salil Pendse (M.S., Bioengineering, primary advisor), Rudy Wilcox (M.S., Bioengineering, primary advisor), Tanya Abaya (Ph.D., Electrical and Computer Engineering), Rajmohan Bhandari (Ph.D., Electrical and Computer Engineering), Ronald Boutte (Ph.D., Electrical and Computer Engineering), Daniel Epstein (Neuroscience), Mitch Frankel (Ph.D., Mechanical Engineering), Shane Guillory (Ph.D., Bioengineering), Kiran Mathews, (M.S., Bioengineering), Nic Roehner (Ph.D., Bioengineering), Jessica Smith (Ph.D., Bioengineering), Kyle Thompson (Ph.D., Bioengineering), Ching Wang (Ph.D., Bioengineering).

2011-2012: Brett Dowden (Ph.D., Bioengineering; primary advisor), Kristina Grimm (M.S., Bioengineering, primary advisor), David Hilgart (Ph.D., Bioengineering; primary advisor), Noah Ledbetter (Ph.D., Bioengineering, primary advisor), Silvana Schister (Ph.D., Bioengineering, primary advisor), Andrew Wilder (Ph.D, Computer Science, primary advisor), Rudy Wilcox (M.S., Bioengineering, primary advisor), Tanya Abaya (Ph.D., Electrical and Computer Engineering), Rajmohan Bhandari (Ph.D., Electrical and Computer Engineering), Mitch Frankel (Ph.D., Mechanical Engineering), Shane Guillory (Ph.D., Bioengineering), Kyle Thompson (Ph.D., Bioengineering).

2010-2011: Brett Dowden (Ph.D., Bioengineering; primary advisor), Kristina Grimm (M.S., Bioengineering, primary advisor), Noah Ledbetter (Ph.D., Bioengineering, primary advisor), Silvana Schister (Ph.D., Bioengineering, primary advisor), Andrew Wilder (Ph.D, Computer Science, primary advisor), Tanya Abaya (Ph.D., Electrical and Computer Engineering), Rajmohan Bhandari (Ph.D., Electrical and Computer Engineering), Mitch Frankel (Ph.D., Mechanical Engineering), Shane Guillory (Ph.D., Bioengineering).

2009-2010: Katie Breneman (Ph.D., Bioengineering), Brett Dowden (Ph.D., Bioengineering; primary advisor), Kabilar Gunalan (Masters, Bioengineering, primary advisor), Noah Ledbetter (Ph.D., Bioengineering, primary advisor), Andrew Wilder (Ph.D, Computer Science, primary advisor), Justin Baker (Ph.D., Bioengineering), Rajmohan Bhandari (Ph.D., Electrical and Computer Engineering), Shane Guillory (Ph.D., Bioengineering), Brandon Thurgood (Ph.D., Electrical Engineering).

2008-2009: Katie Breneman (Ph.D., Bioengineering), Brett Dowden (Ph.D., Bioengineering; primary advisor), Kabilar Gunalan (Masters, Bioengineering, primary advisor), Noah Ledbetter (Ph.D., Bioengineering, primary advisor), William Nesse (Ph.D., Mathematics, co-advisor), Justin Perry (Masters, Bioengineering; primary advisor), Sarah (Davis) Towns (Ph.D., Bioengineering, primary advisor), Andrew Wilder (Ph.D, Computer Science, primary advisor), Justin Baker (Ph.D., Bioengineering), Rajmohan Bhandari (Ph.D., Electrical and Computer Engineering), Shane Guillory (Ph.D., Bioengineering), Keith Tracey (Masters, Electrical Engineering), Brandon Thurgood (Ph.D., Electrical Engineering), Janelle (Jeffs) Williamson (Ph.D., Bioengineering).

2007-2008: Katie Breneman (Ph.D., Bioengineering), Brett Dowden (Ph.D., Bioengineering; primary advisor), Kabilar Gunalan (Masters, Bioengineering, primary advisor), Noah Ledbetter (Ph.D., Bioengineering, primary advisor), William Nesse (Ph.D., Mathematics, co-advisor), Justin Perry (Masters, Bioengineering; primary advisor), Sarah (Davis) Towns (Ph.D., Bioengineering, primary advisor), Andrew Wilder (Ph.D, Computer Science, primary advisor), Justin Baker (Ph.D., Bioengineering), Rajmohan Bhandari (Ph.D., Electrical and Computer Engineering), Shane Guillory (Ph.D., Bioengineering), Keith Tracey (Masters, Electrical Engineering), Brandon Thurgood (Ph.D., Electrical Engineering), Janelle (Jeffs) Williamson (Ph.D., Bioengineering).

2006-2007: Rajmohan Bhandari (Ph.D., Electrical and Computer Engineering), Brett Dowden (Ph.D., Bioengineering; primary advisor), Berton Earnshaw (Ph.D., Mathematics), Shane Guillory (Ph.D., Bioengineering), Kabilar Gunalan (Masters, Bioengineering, primary advisor), Janelle (Jeffs) Williamson (Ph.D., Bioengineering), Noah Ledbetter (Ph.D., Bioengineering, primary advisor), John McDaniel (Ph.D., Exercise and Sports Science), William Nesse (Ph.D., Mathematics, co-advisor), Justin Perry (Masters, Bioengineering; primary advisor), Sarah (Davis) Towns (Ph.D., Bioengineering, primary advisor), Andrew Wilder (Ph.D, Computer Science, primary advisor), Keith Tracey (Masters, Electrical Engineering), Brandon Thurgood (Ph.D., Electrical Engineering).

2006: Christopher Butson (Ph.D.), Brett Dowden (Ph.D.), Janelle Jeffs (Ph.D.), Shane Guillory (Ph.D.), John McDaniel (Ph.D., Exercise and Sports Science), William Nesse (Ph.D.), Andrew Wilder (Ph.D.), Tracy Williamson (Masters)
2005: Christopher Butson (Ph.D.), Brett Dowden (Ph.D.), Janelle Jeffs (Ph.D.), Shane Guillory (Ph.D.), Daniel McDonnall (Ph.D.), John McDaniel (Ph.D.), William Nesse (Ph.D.), David Warren (Ph.D.), Andrew Wilder (Ph.D.), Tracy Williams (Masters)
2004: Christopher Butson (Ph.D.), Brett Dowden (Ph.D.), Xin Guan (Ph.D.), Shane Guillory (Ph.D.), Janelle Jeffs (Ph.D.), Daniel McDonnall (Ph.D.), Bao-Khang Nguyen (Ph.D.), Jennifer Walsh (Ph.D.), David Warren (Ph.D.)
1996-2003: Almut Branner (Ph.D.), Scott Brown (Ph.D.), Christopher Butson (Ph.D.), Gurpreet Dhillon (Ph.D.), Tamer Ghanem (Ph.D.), Xin Guan (Ph.D.), Shane Guillory (Ph.D.), Robert Renden (Ph.D., Neuroscience), Jill Shea (Ph.D.), Bao-Khang Nguyen (Ph.D.), David Warren (Ph.D.), Ning Zhang (Ph.D.)

University of Utah, University-level Mentoring

Faculty advisor, UofU student group Secular Humanism, Inquiry and Freethought (SHIFT), 2008-2012. International group winner, "Best Educator Award" from the Secular Student Alliance, 2010. "Best student group" of the month (UofU), 2011.

- 2012 Activities: Organized Speaker for on-campus Darwin Week (Jim Tabory) plus one additional outside speaker (P.J. Myers)
- 2011 Activities: Organized on-campus Darwin Week seminar series (5 speakers, 5 public lectures). Organized two on-campus public lectures for two outside speakers (Dan Barker, Greta Christina).

Princeton University Ph.D. Committees (1988-1996)
On Ph.D. committees for 21 different graduate students

E. Bowman, A. Brown, M. Carosella, X. Fang, J. Fost, J. Gardner, C. Gooch, G. Hunter, S. Musil, S. Kumon-Nakamura, L. Nelson, E. Phelps, L. Reuter, K. Schroeder, E. Schuman, D. Schwartz, L. Schultz, J. Skelly, K. Taylor, G. Trafton, L. Wilkinson

Extra-institutional Dissertation Committees

Alastair John Loutit. Ph.D, 2020. *Suitability of the Dorsal Column Nuclei for a Neural Prosthesis: Functional Considerations*. School of Medical Sciences. University of New South Wales, Sydney, Australia. Dean's Award nominee.
Giulia Gerboni, Ph.D. 2019. *Stent-based Endovascular Brain Interface: Characterization of Recording and Stimulating Properties,* Department of Biomedical Engineering, University of Melbourne, Australia.
R.F. Rogers, Ph.D. 1995. Department of Psychology, Rutgers Univ., NJ. James McKeen Catell Award, 1996: Outstanding Doctoral Dissertation in Psychology, New York Academy of Sciences, New York NY.
B.A. Goldsmith, Univ. of Pennsylvania, Ph.D. 1993.

7. Awards to Supervised Students and Groups

Faculty Advisor: 32 Awards, Univ. of Utah; 32 Awards Total

Jacob George, Outstanding Dissertation Award, Biomedical Engineering Dept., Univ. of Utah, May 2021.
Michael Paskett, Society for Neuroscience Professional Development Award, Nov 2020
Jacob George, NIH Director's Early Independence Award: Recipient, Fall 2020. (First-ever recipient, UofU)
Michael Paskett, NIH F31 Predoctoral Fellowship, 2020-2022
Jacob George, EMBS 1st-place Student Paper Competition award, July 2020
Michael Paskett, Spheres of Translation Across the Research Spectrum (STARS) TL1 Predoctoral Training Fellowship, Utah Center for Clinical and Translational Science, 2020-2022 (terminated 2020 for F31 Fellowship)
Sri Radhakrishnan, Undergraduate Research Scholar, Honors Thesis, May 2020.

Jacob George, NIH Director's Early Independence Award: Finalist, Univ. Utah, Fall 2019
Mark Brinton, postdoctoral fellow, Grand Prize Winner, Innovation in Research & Technology Competition, Ripple Neuro Inc. Prize included a Quest HD+Stim system ($40k value). Oct. 2019.
Jacob George, Finalist, Promising Young Investigator Award, Ripple Neuro LLC, Oct. 2019
Jacob George, Awardee, Utah Associated Students Travel Award, 2019.
Sri Radhakrishnan, 3rd-place undergraduate poster presentation, Utah Bioengineering Conference, September 2019.
Nathanial Olsen, 1st-place podium presentation, Biomedical Engineering Senior Symposium, April 2019.
Suzanne Wendelken, University of Utah College of Engineering Outstanding Dissertation Award, 2018.
Anna Harding, 1st-place award, undergraduate student poster presentation, Utah Bioengineering Conference, December 2018. Undergraduate Research Scholar. Honors thesis, 2019.
Jacob George, 1st-place award for a student podium presentation at the Utah Bioengineering Conference, December 2017.
Jacob George. Graduate Student Travel Assistance, 2017.
Jacob George, NSF Predoctoral Fellowship, 2017-2020.
Jacob George, Awardee, Trainee Professional Development Award, Society for Neuroscience, Nov. 2017.
Jacob George, Panelist, Press Conference, Society for Neuroscience, Nov. 2017.
Jacob George, Society for Neuroscience Travel Grant, 2017.
Jacob George, 3rd-place award for a student podium presentation at the Utah Bioengineering Conference, December 2016.
Jacob George, Don B. Olsen Graduate Fellowship, 2016-2017.
Kacey Gao, 3nd-place poster award, Bioengineering Department Senior Symposium, April 2016.
David Page, 1st-place award for a student podium presentation at the Utah Bioengineering Conference, 2014.
Brett Dowden, award for student podium presentation at the Utah Bioengineering Conference, ~2011.
UofU student group, Secular Humanism, Inquiry and Freethought (SHIFT). International group winner, "Best Educator Award" from the Secular Student Alliance, 2010. "Best student group" of the month (UofU), Feb. 2011.
Sarah (Davis) Towns, Neural Interfaces Conference, Travel Award, June 2008
Daniel McDonnall, University of Utah, 2004-2005 (with R. Normann): Graduate Student Travel Award
Xin Guan, University of Utah (1998-2004): Whitaker Fellowship (1998-1999, 1999-2000); First Place, Bioengineering Department Annual Poster Contest, 1998
Christopher R. Butson, University of Utah (1998-2006): Whitaker Fellowship (1998-1999, 1999-2000)
Scott Butson, University of Utah (1999-2000): Whitaker Fellowship (1999-2000)
Roy M. Smeal, University of Utah (1998): Whitaker Fellowship (1997-1998, 1998-1999)
Laura M. Schultz, Princeton University (1993-1997): NSF Predoctoral Fellowship, 1993-1997
Joshua W. Fost, Princeton University (1991-1996): Office of Naval Research Predoctoral Fellowship (1991-1995), Charlotte Elizabeth Procter Honorific Fellowship (1995-1996)
Diana Johanson, Junior Independent Work (1994), Howard Warren Crosby Junior Prize (Princeton University) as the outstanding Junior concentrator in Psychology.
Jason Cooper, Senior Thesis, 1993: Co-recipient, Marilyn Shaw Award (from Psychology Department, Rutgers University), given to "the graduating senior with the most outstanding promise in research." (Thesis research conducted in Clark Laboratory at Princeton University in conjunction with Princeton University-Rutgers University/UMDNJ Neuroscience Consortium.)

Dissertation Committee Member

R.F. Rogers, Rutgers Univ., Ph.D. 1995. James McKeen Catell Award, 1996: Outstanding Doctoral Dissertation in Psychology, New York Academy of Sciences, New York NY.

Research and Scholarship

1. Extramural Funding

Funded

Over $20 Million since 1996 (at University of Utah)

2/1/2023-2024. Biological Input/Output Systems SRA #2. *Histological Analysis, Electrode Characterization, and FDA Supplement for Implanted Utah Slanted Electrode Arrays*. $121,095. PI: George, J. GC Role: Co-I.

08/1/2022-07/31/2025. NIH RF1NS128569 (BRAIN Initiative). *Non-invasive Targeted Neuromodulation*. Total costs: $1,428,121 (total costs). PI: Kubanek, J. GC role: Co-I. Project Grant RF1NS128569 - GovTribe.

2/2022-2023. Biological Input/Output Systems SRA #1. *Optimal Feature Generation for Peripheral Nerve Interfaces to Guide the Development of Dexterous Neuroprostheses*. $129,382. PI: George, J. GC Role: Co-I.

7/23/2021-2/3/2022. Subcontract to SRI, DARPA Prime HR00111990046. $115,392. Intelligent Neural Interfaces Experimental Follow-on. GC role: PI.

9/25/2019-8/31/2021. NIH/NIAMS 1UH2AR076736-01. $989,836 total costs. *Focused Ultrasound Neuromodulation of Dorsal Root Ganglion for Noninvasive Mitigation of Low Back Pain.* PI: Reike, V. GC role: Co-I.

9/1/2019-9/30/2022. NSF-1901236. *Collaborative Online Learning and Control for Motor Prosthesis.* $508,255 (total costs). UU PI: D.J. Warren. GC role: Co-PI.

09/01/2015 – 08/31/2019. NSF ECCS-1533649, NCS-FO. $785,615 total costs. *Sensory-Motor Integration via Recording and Stimulating Arm Nerves.* PI: Warren, D. Co-PI's: G.A. Clark, D. Hutchinson, V.J. Mathews.

2/9/2015-2/8/2023. DARPA, *Hand Proprioception and Touch Interfaces (HAPTIX)*. N66001-15-C-4017. *Embodied Neuroprostheses*. Total (Phases 1-3): $4,829,273. Phase 1 (2/2015-8/2016): $1,464,847. Phase 2 (3/2016-2/2019): $2,880,733. Phase 3: 2/9/2019-2/8/2020): $483,653. PI: G. A. Clark. Co-I's: D. Hutchinson, L. Rieth, D. Warren, V.J. Mathews.

7/1/2013-6/30/2017 NSF, 1310654. *Optrode array for optical neural stimulation and recording.* $180,000 total costs. Blair, S., PI; GC role: Co-PI

10/1/2013-9/30/2017. DOD, Dept. Army USAMRAA. *Peripheral nerve regeneration with a novel drug-delivering nerve conduit.* $750,000 total costs. Agarwal, J., PI; GC role: Co-PI.

3/2012-2/2016. DARPA, *Reliable Neural-Interface Technology/Reliable Peripheral Interfaces (RE-NET RPI)*. N66001-12-R-4042/1300230998. $1,400,179 total costs. PI: G. Clark. B. Greger, Co-PI; D. Hutchinson, Co-I.

9/30/2010-9/29/2013. DOD, W81XWH-10-1-0931. *Brain-controlled intrafascicular nerve stimulation with high-count electrode arrays for producing coordinated hand movements in nonhuman primates*. $657,552 total costs. PI: G Clark. Co-Investigator: L. Miller (Northwestern).

5/20/2010-5/19/2011. NIH 1S10-RR026565-01. *Tandem Instrumented Treadmill for Accurate Assessment of In-vivo Joint Kinetics*. $224,825 total costs. PI:. A. Anderson. GC role: Co-Investigator.

8/1/2009-7/31/2012, NIH/NINDS, R01-NS064318-01A1. *Next generation wireless neural interfaces for chronic and acute applications.* $2,831,343 total costs. PI: F. Solzbacher. GC Role: Co-Investigator.

2006-2010, DARPA, N66001-06-C-8005, *Revolutionizing Prosthetics,* Phase I: $3,680,000; Phase II: I $5,499,999; Total $9,179,999. PI: G. Clark. Co-Investigators: B. Greger, R. Harrison, D. Hutchinson, F. Solzbacher, R. Normann, R. Tresco.

2005-2010, NIH, R01-NS039677 *Multisite, Intrafascicular Stimulation for Stance.* $1,777,113. PI: R. Normann. Co-PI and Co-director: G. Clark

2003-2010, NIH/NIMH R01-MH068392-1, *Contextual Spike-Timing Codes in Sensory Processing.* $835,180. PI: G. Clark

1998-2000, Whitaker Foundation Extension Award, *Engineering of Neural Interfaces*; $1,000,000. PI: R. Normann; Co-PI: G. Clark

1998-2000, NSF, IBN-9796235, *Neuronal Substrates of Learning in Aplysia*; $154,047. PI: G.Clark

1997, NSF, IBN-9796235, *Neuronal Substrates of Learning in Aplysia*; $24,448. PI: G.Clark
1996-1997, NSF, IBN 9514619, *Neuronal Substrates of Learning in Aplysia*, $200,000 (transferred). PI: G. Clark
1989-1995, *Pew Biomedical Scholar Award*, $200,000. PI: G. Clark.
1989-1995, American Cyanamid, *Princeton University-American Cyanamid Neuroscience Seminar Series*, $45,000 ($6,000 to $9,000 annually). PI: G. Clark
1992-1994, James S. McDonnell Foundation, *Exchange Program for Collaborative Research and Training in Developmental, Molecular and Behavioral/Cognitive Neuroscience*, Princeton University-Rutgers University-Robert Wood Johnson Medical School, $168,133 (R. Nowakowski, PI, RWJMS; G.A. Clark, Princeton University Representative)
1992, James S. McDonnell Foundation, *Joint Princeton University-Rutgers University-Robert Wood Johnson Medical School Symposium on Learning and Memory*, Princeton University. Co-Organizers: I. Black and G. Clark
1990-1992, Alfred P. Sloan Fellowship, $25,000. PI: G.. Clark
1989-1990, Office of Naval Research, $75,000. PI: G. Clark
1987-1988, Office of Naval Research, $75,000. PI: G. Clark
1982-1984, NIMH Postdoctoral Fellowship
1981-1982, NIMH Predoctoral Fellowship
1980, University of California Regents' Dissertation Fellowship
1979, Chancellor's Patent Fund Award
1976, Regents' Fellow of the University of California

Funded Collaborative Programs

2002-2007. NSF IGERT, *Cross-disciplinary Research Training in Mathematical Biology.* $2.9 M. PI's: F. Adler, A. Fogelson, P. Bressloff, J. Keener, and M. Lewis. G. Clark: Faculty Participant
2006-2011. NIH. *Predoctoral Interdepartmental Training Program in Neuroscience*. $900,000. PI: M. Lucero. G. Clark: Faculty Participant.

2. Intramural Funding

PI on University of Utah intramural grants since 1996; $156,772 total. Participant on others.

7/2023- 6/2026. Utah State Legislature Deep Tech Initiative, Neurotechnology Certificates & Neuroengineering Graduate Degree Programs. Utah System of Higher Education. PI: J. George. G.Clark, faculty participant. Direct Costs: $667,226 Total Costs: $667,226
2013. *Osseointegrated Mount for Advanced Prosthetic Limb and Utah Slanted Electrode Array*. PI: G. Clark. Co-PI: Kent Bacchus. $33,000.
2010-2011. *Developing Utah Slanted Optrode Arrays for Optical Stimulation of Neural Tissue.* $30,000. PI: G. Clark. Co-PIs: S. Blair, L. Rieth, F. Solzbacher, P. Tathireddy, P. Tresco.
2006-2007, *MEMS-Based, Spatially-Specific Electrical Stimulation and Drug Delivery for Pain Relief.* $16,667, PI: G. Clark. (Overall PI: J. Michael McIntosh.)
2000-2001, *Bio-based Selective Stimulation of Nerve Fibers for Motor and Sensory Neuroprostheses*, $31,500. PI: G. Clark, Co-PI: R. Normann.
1999-2000, Base Engineering Equipment Fund (BEEF) Award, *Seeing is Believing: Visualizing the Biocompatibility of Bioengineering Devices and Materials in Graduate and Undergraduate Teaching Laboratories*, $45,555. PI: G. Clark.

3. Publications

Google Scholar: http://bit.ly/2tiCgde.

A. Books and Book Chapters

15 book chapters

1. Thompson, R.F., Berger, T.W., Berry, S.D., Clark, G.A., Kettner, R.N., Lavond, D.G., Mauk, M.D., McCormick, D.A., Solomon, P.R., and Weisz, D.J. Neuronal substrates of learning and memory. In C.D. Woody (ed.), *Conditioning: Representation of Involved Neural Function*. New York: Plenum Press, 1982.
2. Weisz, D.J., Clark, G.A., Yang, B.Y., Thompson, R.F., Solomon, P.R., and Berger, T.W. Activity of dentate gyrus during NM conditioning in rabbit. In C.D. Woody (ed.), *Conditioning: Representation of Involved Neural Function*. New York: Plenum Press, 1982.
3. Clark, G.A. *Analysis of hippocampal afferents during classical conditioning of the rabbit nictitating membrane response*. Doctoral dissertation, University of California, Irvine, 1982.
4. Thompson, R.F., Berger, T.W., Weisz, D.W., Clark, G.A., and Yang, B.Y. Neural activity in learning: neuronal substrate of classical conditioning in the hippocampus. In R. Sinz and M.R. Rosenzweig (eds.), *Proceedings of Psychophysiology*. Amsterdam: Elsevier Biomedical Press, 1983.
5. Thompson, R.F., McCormick, D.A., Lavond, D.A., Clark, G.A., Kettner, R.E., and Mauk, M.D. The engram found? Initial localization of the memory tract for a basic form of associative learning. In I.M. Sprague and A.N. Epstein (eds.), *Progress in Psychobiology and Physiological Psychology*. New York, Academic Press, 1983.
6. Thompson, R.F., Barchas, J.D., Clark, G.A., Donegan, N.H., Kettner, R.E., Lavond, D.G., Madden, J., IV, Mauk, M.D., and McCormick D.A. Neuronal substrates of associative learning in the mammalian brain. In D.L. Alkon and J. Farley, (eds.), *Primary Neural Substrates of Learning and Behavioral Change*. Princeton, N.J.: Princeton Univ. Press, 1984.
7. Thompson, R.F., Clark, G.A., Donegan, N.H., Lavond, D.G., Madden, IV, J., Mamounas, L.A., Mauk, M.D., and McCormick, D.A. Neuronal substrates of learning and memory: A "multiple-trace" view. In G. Lynch, J.L. McGaugh and N.M. Weinberger, (eds.), *Neurobiology of Learning and Memory*. New York: Guilford Press, 1984.
8. Thompson, R.F., Clark, G.A., Donegan, N.H., Lavond, D.G., Lincoln, J.S., Madden, J., IV, Mamounas, L.A., Mauk, M.D., and McCormick, D.A. Neuronal substrates of basic associative learning. In L. Squire and N. Butters (eds.), *Neuropsychology of Memory*. New York: Guilford Press, 1984.
9. Clark, G.A., Hawkins, R.D., and Kandel, E.R. Cell biological perspectives on learning. In A.K. Asbury, G.M. McKhann, and W.I. McDonald (eds.), *Diseases of the Nervous System*. Philadelphia, Ardmore Medical Books, 1986.
10. Thompson, R.F., Donegan, N.H., Clark, G.A., Lavond, D.G., Lincoln, J.S., Madden, IV, J., Mamounas, L.A., Mauk, M.D., and McCormick, D.A. Neuronal substrates of discrete, defensive conditioned reflexes, conditioned fear states, and their interactions in the rabbit. In I. Gormezano, W.F. Prokasy, and R.F. Thompson (eds.), *Classical conditioning III: Behavioral, Neurophysiological and Neurochemical Studies in the Rabbit*. Hillsdale, N.J.: Erlbaum, 1987.
11. Hawkins, R.D., Clark, G.A., and Kandel, E.R. Cell biological studies of learning in simple invertebrate and vertebrate systems. In V. Mountcastle and F. Plum (eds.), *Handbook of Physiology, Section 1: The Nervous System*. Bethesda, M.D.: American Physiological Society, 1988.
12. Clark, G.A., and Hawkins, R.D. Learning and the single cell: Cellular strategies for information storage in the nervous system. In J. Davis, R.W. Newburgh, and E. Wegman (eds.), *Brain Structure, Learning and Memory*. Washington, D.C.: American Association for the Advancement of Science, 1988.
13. Clark, G.A., and Schuman, E.M. Snails' tales: Initial comparisons of synaptic plasticity underlying learning in *Hermissenda* and *Aplysia*. In L. R. Squire and N. Butters (eds.), *Neuropsychology of Memory* (2nd ed.). New York: Guilford Press, 1992.
14. Clark, G.A. The ins and outs of classical conditioning: Maxims from a mollusk. In J.E. Steinmetz, M. Gluck, and P. Solomon (eds.), *Model Systems and the Neurobiology of Associative Learning*. Lawrence Erlbaum Associates, 2001.
15. Clark, G.A. Regulation of synaptic efficacy. In J.L. McClelland and R.F. Thompson (eds.), *International Encyclopedia of the Social and Behavioral Sciences*. Oxford, England, Elsevier Science, 2002.

B. Journal Articles

>62 Peer-reviewed journal articles

1. Berger, T.W., Clark, G.A., and Thompson, R.F. Neuronal plasticity recorded from limbic structures during conditioning. *Physiol. Psychol*., **8**, 155-167, 1980.
2. McCormick, D.A., Lavond, D.G., Clark, G.A., Kettner, R.E., Rising, C.E., and Thompson, R.F. The engram found? Role of the cerebellum in classical conditioning of nictitating membrane and eyelid responses. *Bull. Psychon. Soc*., **18**, 103-105, 1981.
3. Lavond, D.G., McCormick, D.G., Clark, G.A., Holmes, D.T. and Thompson, R.F. Effects of ipsilateral rostral pontine reticular lesions on retention of classically conditioned nictitating membrane and eyelid responses. *Physiol. Psych*., **9**, 335-339, 1981.
4. McCormick, D.A., Clark, G.A., Lavond, D.G., and Thompson, R.F. Initial localization of the memory trace for a basic form of associative learning. *Proc. Natl. Acad. Sci. USA*, **79**, 2731-2735, 1982.
5. Solomon, P.R., Weisz, D.J. and Clark, G.A. A microprocessor control system and solid state interface for controlling electrophysiological studies in conditioning. *Behav. Res. Methods and Instrum*., **15**, 57-65, 1983.
6. Jordan, T.C., and Clark, G.A. Early undernutrition impairs hippocampal long-term potentiation in adult rats. *Behav. Neurosci*., **97**, 319-322, 1983.
7. Clark, G.A., McCormick, D.A., Lavond, D.G. and Thompson, R.F. Effects of lesions of cerebellar nuclei on conditioned behavioral and hippocampal neuronal responses. *Brain Res*., **291**, 125-136, 1984.
8. Clark, G.A., and Kandel, E.R. Branch-specific facilitation in *Aplysia* siphon sensory cells. *Proc. Natl. Acad. Sci. USA*, **81**, 2577-2581, 1984.
9. Weisz, D.J., Clark, G.A., and Thompson, R.F. Increased responsivity of dentate granule cells during nictitating membrane response conditioning in rabbit. *Behav. Brain Res*., **12**, 145-154, 1984.
10. Frost, W.N., Clark, G.A., and Kandel, E.R. Parallel processing of short-term memory for sensitization in *Aplysia*. *J. Neurobiol*., **19**, 297-334, 1988.
11. Hawkins, R.D., Lalevic, N., Clark, G.A., and Kandel, E.R. Classical conditioning of the *Aplysia* siphon-withdrawal reflex exhibits response specificity. *Proc. Natl. Acad. Sci. USA*, **86**, 7620-7624, 1989.
12. Clark, G.A., Hawkins, R.D., and Frost, W.N. How neural are neural networks? A comparison of information processing and storage in artificial and real neural networks. *J. Statist. Plann. Inference*, **33**, 27-65, 1992.
13. Clark, G.A. and Kandel, E.R. Induction of long-term facilitation in *Aplysia* sensory neurons by local application of serotonin to remote synapses. *Proc. Natl. Acad. Sci. USA*, **90**, 11411-11415, 1993.
14. Schuman, E.M. and Clark, G.A. Synaptic facilitation at connections of *Hermissenda* Type B photoreceptors. *J. Neurosci*., **14**, 1613-1622, 1994.
15. Clark, G.A., Hawkins, R.D., and Kandel, E.R. Activity-dependent enhancement of presynaptic facilitation provides a cellular mechanism for the temporal specificity of classical conditioning in *Aplysia*. *Learn. Memory*, **1**, 243-257, 1994.
16. Clark, G.A. Fear and loathing in the amygdala. *Curr. Biol*., **5**, 246-248, 1995.
17. Fost, J.W. and Clark, G.A. Modeling *Hermissenda*: I. Differential contributions of I_A and I_C reductions to Type-B cell plasticity. *J. Computational Neurosci*., **3**, 137-153, 1996a.
18. Fost, J.W. and Clark, G.A. Modeling *Hermissenda*: II. Effects of variations in Type-B cell excitability, synaptic strength, and network connectivity. *J. Computational Neurosci*., **3**, 155-172, 1996b.
19. Fang, X. and Clark, G.A. Differential responses of *Aplysia* siphon motor neurons and interneurons to tail and mantle stimuli: Implications for behavioral response specificity. *J. Neurophysiol*., **76**, 3895-3909, 1996.
20. Schultz, L.M. and Clark, G.A. GABA-induced synaptic facilitation at type B to A photoreceptor connections in *Hermissenda*. *Brain Res. Bull*., **42**, 377-383, 1997a.
21. Schultz, L.M., Lee, E.S., and Clark, G.A. Synaptic depression at type B to A photoreceptor connections in *Hermissenda*. *NeuroReport,* **9**, 437-440, 1998.
22. Schultz, L.M., Butson, C.R., and Clark, G.A. Post-light potentiation at type B to A photoreceptor connections in *Hermissenda*. *Neurobiol. Learn. Mem*., **76**, 7-32, 2001.
23. McDonnall D., Clark G.A., Normann R. Interleaved, multisite electrical stimulation of cat sciatic nerve produces fatigue-resistant, ripple-free motor responses. *IEEE Trans. Neural Syst. Rehabil. Eng.,* **12**, 208-215, 2004. PMID: 15218935. http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=1304862

24. McDonnall D., Clark G.A., Normann R. Selective motor unit recruitment via intrafascicular multielectrode stimulation. *Can. J. Physiol. Pharmacol.*, **82**, 599-609, 2004. PMID: 15523517. http://rpas.web-p.cisti.nrc.ca/RPAS/RPViewDoc?_handler_=HandleInitialGet&journal=cjpp&volume=82&calyLang=eng&articleFile=y04-047.pdf
25. Normann, R.A., McDonnall, D., and Clark, G.A., Control of skeletal muscle force with currents injected via intrafascicular microelectrode arrays, *IEEE-EMBS*, **27**, 7644-7647, 2005. DOI: 10.1109/IEMBS.2005.1616282
26. Normann R.A., McDonnall D., Clark G.A., Stein R.B., Branner A. Physiological activation of the hind limb muscles of the anesthetized cat using the Utah Slanted Electrode Array. *2005 IEEE International Joint Conference on Neural Networks,* Jul; 5: 3101-3108, 2005. DOI: 10.1109/IJCNN.2005.1556422
27. Hawkins, R.D., Clark G.A., Kandel E.R. Operant conditioning of gill withdrawal in *Aplysia*. J.Neurosci. **26**, 2443-2448, 2006. http://www.jneurosci.org/
28. Guan X., Clark G.A. Essential role of somatic and synaptic protein synthesis and axonal transport in long-term synapse-specific facilitation at distal sensorimotor connections in *Aplysia*. Biol. Bull. **210**: 238-254, 2006. http://www.biolbull.org/content/vol210/issue3/
29. Nesse, W.H., Clark, G.A., Bressloff, P.C. Spike patterning of a stochastic phase model neuron given periodic inhibition. *Physical Review E* **75**, 031912 1-10, 2007. PMID: 17500731. http://link.aps.org/abstract/PRE/v75/e031912.
30. Butson, C.R., and Clark, G.A. Random noise paradoxically improves light-intensity encoding in *Hermissenda* photoreceptor network. *J. Neurophysiol.*, **99**:146-54, 2008. (Epub 2007 Nov 14.) PMID: 18003873. http://jn.physiology.org/cgi/content/full/99/1/146.
31. Butson, C.R., and Clark, G.A. Mechanisms of noise-induced improvement in light-intensity encoding in *Hermissenda* photoreceptor network. *J. Neurophysiol.*, **99**:155-65, 2008. (Epub 2007 Nov 14.) PMID: 18003872. http://jn.physiology.org/cgi/reprint/99/1/155.
32. Gunalan, K., Warren, D.J., Perry, J.D., Normann, R.A., Clark, G.A. An automated system for measuring tip impedance and among-electrode shunting in high-density microelectrode arrays. *J. Neurosci. Methods,* **178**:263-9, 2009. PMID: 19150630. http://dx.doi.org/10.1016/j.jneumeth.2008.12.020.
33. Thurgood, B.K., Warren, D.J., Ledbetter, N.M., Clark, G.A., Harrison, R.R. A wireless integrated circuit for 100-channel charge-balanced neural stimulation. *IEEE Trans. Biomed. Circuits and Systems* **3**: 405-414, 2009. http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5335875&isnumber=5335874&tag=1.
34. Wilder, A.M., Hiatt, S.D., Dowden, B.R., Brown, N.A.T. Clark, G.A. An integrated platform for functional electrical stimulation using high-channel-count neural interfaces. I: Interface calibration. *Transactions on Neural Systems & Rehabilitation Engineering.* **17**:504-511, 2009. PMID: 19666339. http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5196809&isnumber=5308700
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C. Journal Articles: Submitted/under review

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D. Refereed Conference Proceedings

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E. Refereed Conference Proceedings: Submitted/under review

F. Abstracts

> 160 Abstracts

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4. Selected Publications in Lay Press

92 opinion pieces, many on the topics of education, science, and engineering

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64. Clark, GA. "No middle ground between God, science." Letter to the Editor. *USA Today,* 20 July 2017. https://www.usatoday.com/story/opinion/2017/07/20/readers-best-comments-no-middle-ground-between-god-and-science/493806001/

65. Clark, GA. “With love like that, who needs hate?” (“Untenable exegesis,” print edition.) Letter to the Editor. *The Salt Lake Tribune,* Sept. 23, 2017. http://www.sltrib.com/opinion/letters/2017/09/24/letter-with-love-like-that-who-needs-hate/
66. Clark, GA. “The goal of scholarship is the truth, not ‘respect’ for a church.” (“Goal of scholarship,” print edition.) Letter to the Editor. *The Salt Lake Tribune*, Oct. 5, 2017 (print edition), Oct. 8, 2017 (web). http://www.sltrib.com/pb/opinion/letters/2017/10/09/letter-the-goal-of-scholarship-is-the-truth-not-respect-for-a-church
67. Clark, GA. “Standing up for all.” Editorial, *The Humanist* (web). Oct. 9, 2017. https://thehumanist.com/commentary/standing-up-for-all
68. Clark, GA. “Tribune plays up fake compatibility between science and religion.” Letter to the Editor. *The Salt Lake Tribune*, Nov. 11, 2017. http://www.sltrib.com/opinion/letters/2017/11/14/letter-tribune-plays-up-fake-compatibility-between-science-and-religion/
69. Clark, GA. “It’s not the job of the Times — or The Tribune — to pay uncritical tribute to Mormon leader Monson.” Letter to the Editor. *The Salt Lake Tribune*, Jan. 15, 2018. https://www.sltrib.com/opinion/letters/2018/01/15/letter-its-not-the-job-of-the-times-or-the-tribune-to-pay-uncritical-tribute-to-mormon-leader-monson/
70. Clark, GA. “Bicyclists often pay more than their fair share of road taxes; motorists pay less.” (“Bicyclists pay more,” print edition). Letter to the Editor. *The Salt Lake Tribune*, March 6, 2018. https://www.sltrib.com/opinion/letters/2018/03/06/letter-bicyclists-often-pay-more-than-their-fair-share-of-road-taxes-motorists-pay-less/
71. Clark, GA. “Stop using the Bible as a model for how to treat people—It’s full of examples of how to be awful.” (“Slaughtering children isn’t spiritually exemplary,” print edition). Commentary. *The Salt Lake Tribune*, May 27, 2018. https://www.sltrib.com/opinion/commentary/2018/05/26/commentary-stop-using-the-bible-as-a-model-for-how-to-treat-people-its-full-of-examples-of-how-to-be-awful/
72. Clark, GA. “Refusing to bake a cake for a gay couple is still discrimination, and it’s still not OK.” (“Regardless of beliefs, discrimination is not OK,” print edition.) Commentary. *The Salt Lake Tribune*, June 8, 2018. https://www.sltrib.com/opinion/letters/2018/06/06/letter-refusing-to-bake-a-cake-for-a-gay-couple-is-still-discrimination-and-its-still-not-ok/comments/
73. Clark, GA. “Time for Mitt Romney to practice what he preaches.” Commentary. *The Salt Lake Tribune*, Aug. 19, 2018. https://www.sltrib.com/opinion/commentary/2018/08/19/commentary-time-mitt/
74. Clark, GA. “Ridiculous and repugnant ideas don’t deserve respect.” Commentary. *The Salt Lake Tribune*, Oct. 10, 2018. https://www.sltrib.com/opinion/commentary/2018/10/10/commentary-ridiculous/
75. Clark, GA. “Students must be taught what science is. And is not.” Commentary. *The Salt Lake Tribune*, Jan. 20, 2019. https://www.sltrib.com/opinion/commentary/2019/01/20/commentary-students-must/
76. Clark, GA. “Mars probe Opportunity had so much to teach us.” Commentary. The Salt Lake Tribune, Feb. 24, 2019. https://www.sltrib.com/opinion/commentary/2019/02/24/commentary-mars-probe/
77. Clark, GA. “Critical thinking is the basis of science.” Commentary. *The Salt Lake Tribune*, April 6, 2019. https://www.sltrib.com/opinion/commentary/2019/04/06/gregory-clark-critical/
78. Clark, GA. “Trump embodies Christian principles.” Letter to the editor. *The Salt Lake Tribune*, April 30, 2019. https://www.sltrib.com/opinion/letters/2019/04/30/letter-trump-embodies/
79. Clark, GA. “With love like that, who needs hate?” Letter to the editor. *The Salt Lake Tribune*, June 10, 2019. https://www.sltrib.com/opinion/letters/2019/06/10/letter-with-love-like/
80. Clark, GA. “The apology the U. owes the McCluskey family.” Commentary. *The Salt Lake Tribune*, July 13, 2019. https://www.sltrib.com/opinion/commentary/2019/07/14/gregory-clark-apology-u/
81. Clark, GA. “Hatred of Immigrants.” Letter to the Editor. Deseret News, Aug. 7, 2019. https://www.deseretnews.com/article/900082733/letter-hatred-of-immigrants.html.
82. Clark, GA. “Public schools are not the place to preach about trusting God.” Commentary. *The Salt Lake Tribune*, Aug. 10, 2019. https://www.sltrib.com/opinion/commentary/2019/08/04/gregory-clark-public/
83. Clark, GA. “Genetic differences are real, but no excuse for discrimination.” Commentary. *The Salt Lake Tribune*, Jan. 10, 2020 (e-edition). https://www.sltrib.com/opinion/commentary/2020/01/11/gregory-clark-genetic/

84. Clark, GA. "Trusting in God to cure COVID-19 is dangerous." Commentary. *The Salt Lake Tribune*, Apr. 10, 2020 (e-edition). (Link no longer available.)
85. Clark, GA. "It is hard to unlearn racism. But we can do it." Commentary. *The Salt Lake Tribune*, June 15, 2020 (e-edition). https://www.sltrib.com/opinion/commentary/2020/06/13/gregory-clark-it-is-hard/
86. Clark, GA. "It took many sacrifices to get where we are." Commentary. *The Salt Lake Tribune*, Nov. 9, 2020 (e-edition). https://www.sltrib.com/opinion/commentary/2020/11/09/gregory-clark-it-took/
87. Clark, GA. We can change the world for ourselves and others (sltrib.com). Jan 1, 2021. *The Salt Lake Tribune.*
88. Clark, GA. "If religion is 'love' we don't need any hate." Commentary. The Salt Lake Tribune, July 1, 2022 (e-edition). This 'loving' deity also drowned every baby on earth and slaughtered an entire nation of firstborns. (sltrib.com)
89. Clark, GA. "What would Jesus do about abuse?" Letter to the editor. *The Salt Lake Tribune,* Aug. 25, 2022. Letter: What would Jesus do about abuse? (sltrib.com)
90. Clark, GA. "Religious bigotry covered with polite-speak is still bigotry." Commentary. *The Salt Lake Tribune*, Sep. 29, 2022 (e-edition). Religious bigotry covered with polite-speak is still bigotry (sltrib.com)
91. Clark, GA. "Religious bigotry deserves no respect." Commentary. *The Salt Lake Tribune*, Dec. 16, 2022 (e-edition). Systemic racial and LGBT bigotry isn't only ancient history (sltrib.com)
92. Clark, GA. Medicine by legislative fiat can be injurious and even deadly (sltrib.com). Commentary. *The Salt Lake Tribune,* Jan. 25, 2023 (e-edition).

5. Invited Keynote and Other Presentations

Presentations by G.A. Clark

Over 180 presentations, including:

1. Winter Conference on the Neurobiology of Learning and Memory, 1981
2. Department of Psychology, Stanford University, 1981
3. *Winter Conference on the Neurobiology of Learning and Memory*, 1982
4. Department of Psychology, Yale University, 1982
5. Department of Biology, Farleigh Dickenson University, 1983
6. *Gordon Conference on Cellular and Molecular Aspects of Neural Plasticity*, 1983
7. *American Association for the Advancement of Science*, 1984
8. *Fifth Charlotte G. Babcock Symposium*, Pittsburgh Psychoanalytic Institute, 1984
9. Department of Biology, State University of New York, 1985
10. Department of Psychiatry, Harlem Hospital, 1986
11. *Conference on Stochastic Methods for Biological Intelligence*, 1986
12. Department of Psychiatry, University of Cincinnati, 1987
13. *Maurice Levine Memorial Lecture*, University of Cincinnati and Cincinnati Psychoanalytic Institute, 1987
14. *DNA and the Human Brain*, Cold Spring Harbor Laboratories, 1987
15. *Cellular and Molecular Biology of Learning and Memory*, Cold Spring Harbor Laboratories Course, 1987
16. Office of Naval Research, Cognitive and Neural Sciences Division, 1988
17. Psychology Department, Princeton University, 1988
18. *ONR Conference on Cellular Mechanisms of Neural Plasticity*, Yale University, 1989
19. Fifth Annual Meeting, *Pew Scholars Program in the Biomedical Sciences*, 1990
20. Psychology Department, Franklin and Marshall College, 1990
21. Fourth Annual Meeting, *New Jersey Neuropsychopharmacology Society*, 1990
22. Biology Department, Rutgers University, 1990
23. *Molecular Neurobiology of Aplysia*, Cold Spring Harbor Laboratories Conference, 1990
24. Psychology Department, Bucknell University, 1990
25. Behavioral Neuroscience Seminar Series, University of Pennsylvania, 1990
26. Department of Neuroscience and Cell Biology, UMDNJ-Robert Wood Johnson Medical School, 1991
27. Laboratory of Molecular and Cellular Neurobiology, National Institutes of Health, 1991
28. *Cellular and Molecular Biology of Learning and Memory*, Cold Spring Harbor Laboratories Course, 1991.

29. *Scandinavian Learning Course*, Sandbjerg, Denmark, 1992.
30. *Learning and Memory*, Cold Spring Harbor Laboratories Conference, 1992.
31. *Molecular Neurobiology of Aplysia*, Cold Spring Harbor Laboratories Conference, 1993. *Neural mechanisms of response specificity. III. Differential responses of siphon motor neurons in interneurons to tail and mantle stimulation.*
32. Program in Physiology and Neurobiology, Rutgers University/Robert Wood Johnson Medical School, 1993. *The long and short of synapse-specific modulations in Aplysia.*
33. *Learning and Memory*, Cold Spring Harbor Laboratories Conference, 1994. *Differential engagement of siphon-withdrawal circuit elements by tail and mantle shock USs: Implications for conditioned response specificity.*
34. *Molecular and Behavioral Biology of Aplysia and Related Molluscs*, Cold Spring Harbor Laboratories Conference, 1995. *Hebbian synapse-specific facilitation and other mechanims for response specificity in Aplysia.*
35. Psychology Department, University of New Hampshire, 1995. *Cell neuronal mechanisms of classical conditioning in Aplysia.*
36. Psychology Department, Amherst College, 1995. *Cell neuronal mechanisms of classical conditioning in Aplysia.*
37. Department of Neuroscience, Tufts University Medical School, 1996. *The ins and outs of learning: Insights from cellular analyses of simple systems.*
38. Department of Brain and Cognitive Sciences, University of Rochester, 1996. *The ins and outs of learning: Insights from cellular analyses of simple systems.*
39. Department of Brain and Cognitive Sciences, University of Rochester, 1996. *Learning-related neural plasticity in Hermissenda.*
40. Toxicology Program, University of Oklahoma Health Sciences Center, 1996. *The ins and outs of synapse-specific neuronal plasticity.*
41. Department of Biology and Biotechnology, Worcester Polytechnic Institute, 1996. *The ins and outs of learning-related synaptic plasticity: Insights from neurobiological analyses of simple systems*.
42. Department of Biology, Harvey Mudd College, 1996. *The ins and outs of learning-related synaptic plasticity: Insights from neurobiological analyses of simple systems*.
43. Biology Department, City College, City University of New York, 1996. *The ins and outs of learning-related synaptic plasticity.*
44. Program in Neuroscience, College of Staten Island, City University of New York, 1996. *The ins and outs of learning: Insights from neurobiological analyses of simple systems.*
45. Department of Bioengineering, University of Utah, 1996. *Neuronal substrates of learning: Insights from biological and computational analyses of simple systems*.
46. Department of Pharmacology and Therapeutics, University of Florida Brain Institute, 1996. *The ins and outs of synapse-specific facilitation.*
47. *Learning and Memory*, Cold Spring Harbor Laboratories Conference, 1996. *Learning-related synaptic facilitation at Hermissenda type B to type A photoreceptor connections.*
48. Bioengineering Department, University of Utah, 1996. *The ins and outs of synapse-specific facilitation: Strategies for information acquisition and storage by single neurons*.
49. Neuroscience Program Seminar Series, University of Utah, 1996. *Neuronal substrates of learning: Insights from biological and computational analyses of simple systems*.
50. Psychology Department, University of Utah, 1997. *Cell neuronal mechanisms of classical conditioning in Aplysia: Temporal specificity, stimulus specificity, and response specificity*.
51. *Cell and Molecular Biology of Aplysia and Related Invertebrates*, Cold Spring Harbor Laboratories Conference, 1997. *Synapse-specific plasticity at Aplysia sensorimotor connections*.
52. Neuroscience Program Mini-Symposium, University of Utah, 1997. *Synapse-specific modifications at Aplysia sensorimotor connections.*
53. Mathematics Department, University of Utah, 1997. *Neuronal substrates of learning: Lessons from computational and physiological analyses of simple systems*.
54. Neuroscience Program Retreat, University of Utah, 1997. *Cellular mechanisms of neural plasticity in simple systems.*
55. Intermountain Chapter, Society for Neuroscience, University of Utah, 1997. *The ins and outs of synapse-specific modifications in Aplysia*.

56. *Winter Conference on the Neurobiology of Learning and Memory*, Park City, UT, 1998. *Long-term facilitation is synapse-specific.*
57. Bioengineering Department, University of Utah, 1998. *The ins and outs of synapse-specific modifications of sensorimotor connections.*
58. *Winter Conference on the Neurobiology of Learning and Memory*, Park City, UT, 1999. *Synaptic and ionic "noise" improve, not degrade, neural network performance.*
59. Bioengineering Department, University of Utah, 2000. *Bio-based Neuroengineering: Insights from Physiological and Computational Analyses.*
60. Rocky Mountain University, 2002. *The Ins and Outs of Sensorimotor Neuroprostheses*.
61. University of Utah, 2004. *Memory: From Molecules to Mind.* University of Utah, Spring 2004. Presented as part of a lecture series on Memory hosted by the Utah Museum of Natural History and the Associated Students of the University of Utah.
62. University of Utah, Amputee and Prosthesis Meeting, 2004. *Restoring Motor Control After Spinal Cord Injury.*
63. Veterans' Administration RR&D Directors' Meeting, Louis Stokes VA Medical Center, Cleveland, OH, 2004. *Towards Restoring Sensory & Motor Function with Multielectrode Arrays*.
64. Tokai University Pacific Center, Honolulu, HI, 2004. *Noise Alters Contextual Spike-Timing Relationships and Improves Light Intensity Encoding in Simulated and Real Hermissenda Photoreceptors*. 10th Anniversary Meeting, *Workshop of Invertebrate Neuroscience*.
65. *Neural network smarts: Lessons from the* Hermissenda *eye.*
66. Humanists of Utah, April, 2005. *Accommodating U: A Contrarian's Sincerely-held Beliefs Regarding the University of Utah Accommodations Policy.* http://www.humanistsofutah.org/2005/AccommodatingU_May-05.html; http://www.humanistsofutah.org/2005/AccommodatingU_May-05.pdf
67. Friday Harbor Laboratories, Microsoft Corporation and Univ. of Washington, Friday Harbor Laboratories Centennial Symposium: *Biological and Computational Perspectives on Intelligent Systems*, June 2005. *Neural network smarts: Lessons from the* Hermissenda *eye*. http://research.microsoft.com/isys05/Abstracts.htm
68. University of Utah. Visit by Alfred Mann Foundation, June 2005. *Restoration of sensory and motor function via Utah electrode arrays.*
69. Telemedicine and Advanced Technology Resesarch Center, Integrated Research Team Meeting. *Neuroprosthetics: Emerging Solutions for the Soldier and Society*. Marina Del Ray, CA. October, 2005. *Restoration of sensorimotor function via intrafascicular Utah slanted electrode arrays.* http://www.tatrc.org/website_neuro05/index.html
70. Bioengineering Department, University of Utah, December 2005. Invited presentation. *Neural Network Smarts: Lessons from the* Hermissenda *eye.* *http://www.bioen.utah.edu/seminars/presentation.php?id=27*.
71. Spinal Cord Injury Forum, Salt Lake City Public Library. *Restoration of Sensory and Motor Function via Neuroprostheses.* Invited presentation, 28 March 2006.
72. University of Utah, National Advisory Council, *Restoration of Sensory and Motor Function via Neuroprostheses*. Invited presentation, 8 April 2006.
73. TATRC/MRMC meeting, University of Utah. *Neural Control of An Advanced Prosthetic Arm via Intrafascicular USEA's.* Invited presentation, May 2006.
74. Mechatronics 2006. *Revolutionizing Prosthetics: The Next Generation of Neurally Controlled Prosthetic Limbs.* Malvern, PA. Keynote address, June 2006.
75. Brain Institute, University of Utah. *Core Facility for Spinal Cord Injury Research, Treatment, & Rehabilitation.* Invited presentation, June 2006.
76. Friday Harbor Laboratories, University of Washington*. Neural Network Smarts: More Lessons from the* Hermissenda *Eye.* Invited presentation, July 2006.
77. IEEE EMBC 2006. Special Workshop on *Innovative Neural Interfaces and Prostheses*. *Restoring Sensory & Motor Function via PNS Neuroprostheses.* New York, NY. Invited presentation, August 2006.
78. CARE-Utah. Restoration of Sensory and Motor Function via Neuroprostheses. Invited presentation, September 2006.
79. Center for Comparative Medicine, University of Utah. Restoration of Sensory and Motor Function via Neuroprostheses. Invited presentation, October 2006.

80. *Cortical and Peripheral Interfaces.* In: Winter Conference on Brain Research 2007. Workshop on *Taking Control with Neural Prosthetic Interfaces. Peripheral Nerve Neuroprostheses.* Snowmass, CO. Invited presentation, January 2007.
81. *Restoration of Sensory and Motor Function via Neural Prostheses.* Spinal Cord Injury Forum, Salt Lake City, UT. Invited presentation, March 2007.
82. *Restoring Sensorimotor Function via Intrafascicular Utah Slanted Electrode Arrays.* In: Durand D, Clark GA, Conference Session Co-Chairs. Neural Engineering: Peripheral Neural Interfaces. Biomedical Engineering Society Annual Fall Meeting, September, 2007. Invited presentation. Los Angeles, CA.
83. *Restoring Sensorimotor Function via Neuromyoelectric Prostheses.* Henry Jackson Foundation. Invited Presentation. 13 November 2007.
84. *Common Ground: Making Meaning in the Arts and Sciences.* Lecture Series, Center for Interdisciplinary Arts and Sciences, University of Utah. Interfaces to Nerve and Brain. Invited presentation. 25 Februrary 2008.
85. *Restoration of Sensory and Motor Function via Neural Prostheses.* Invited presentation. Spinal Cord Injury Outreach Program, Salt Lake City, UT. 8 April 2008.
86. *Role and Importance of Sensory Feedback for (Prosthetic and Natural) Limb Control. Invited presentation.* 16 June 2008. Neural Interfaces Conference. Cleveland, OH.
87. *Neural and Myoelectric Interfaces to Muscle, Nerve, and Brain*. Neurotherapy Summer School of Brain Research, Amsterdam. Invited presentation. 27 August 2008.
88. *Restoring Motor and Sensory Function with Interfaces to Muscle, Nerve, and Brain.* Salt Lake City Public Library. Invited presentation, Brain Awareness Week. 18 March 2009.
89. *Restoration of Sensory and Motor Function via Neural Prostheses.* Spinal Cord Injury Outreach Program, Salt Lake City, UT. Invited Presentation. 14 April 2009.
90. *Restoring Motor and Sensory Function with Neuroprostheses.* International Congress of Physiological Sciences, Kyoto, Japan. Invited presentation. 31 July 2009.
91. *Restoring Motor and Sensory Function with Neuroprostheses.* Osaka University, Osaka, Japan. Invited presentation. 3 August 2009.
92. *Restoring Sensory & Motor Function with Intrafascicular Neuroprostheses.* Lockheed Martin Aculight. Invited presentation. 9 November 2009.
93. *Restoring Motor and Sensory Function with Neuroprostheses.* University of Utah Veterans' Day Panel. Invited presentation. 11 November 2009.
94. Clark, G.A. *I Think Therefore I Robot: Direct Neural Control of Artificial and Biological Limbs*. FIRST Robotics Competition, Regionals. College of Engineering, University of Utah, 18 March 2010.
95. Clark, G.A. *Restoration of Sensory and Motor Function via Neural Prostheses.* Spinal Cord Injury Outreach Program, Salt Lake City, UT. Invited Presentation. 13 April 2010.
96. Clark, G.A. *From NMR to neuroprostheses: A personal journey inspired by RFT.* Richard F. Thompson Symposium, University of Southern California, Los Angeles, CA. 20 May 2010.
97. Clark, G.A., Ledbetter, N.M., Warren, D.J., Wilder, A.M., Dowden, B.R., Frankel, M.A., Ethier, C., Oby, E.R., Miller, L.E., Solzbacher, R., Harrison, R.R., Normann, R.A., *Restoring Sensorimotor Function with Utah Slanted Electrode Arrays in Peripheral Nerves.* Biomedical Engineering Society. Invited presentation. Austin TX, 8 October 2010, OP-8-2-4B.
98. Clark, G.A., Ledbetter, N M., Warren, D.J., Miller, L.E., Greger, B., Solzbacher, F., Harrison, R.R., Rieth, L.W., Tathireddy, P. Blair, S.M., Tresco, P.A., Normann, R.A. *Selective, High-Channel-Count Intrafascicular Peripheral Nerve Interfaces*. DARPA, Reliable Peripheral Interfaces, Proposers' Day. Invited presentation. Arlington VA, 9 November 2010.
99. Clark, G.A. *Restoration of Sensory and Motor Function via Neural Prostheses.* Spinal Cord Injury Outreach Program, Salt Lake City, UT. Invited Presentation. April 2011.
100. Clark, G.A. *Intrafascicular infrared nerve stimulation with Utah Slanted Optrode Arrays.* Invited presentation. Infrared Neural Stimulation Summit, Northwestern University, Chicago, 22 July 2011.
101. Clark, G.A. *Recording Sensory and Motor Information from Peripheral Nerves with Utah Slanted Electrode Arrays.* Invited presentation. IEEE Engineering in Medicine and Biology Conference, Boston, MA. 2 September 2011.

102. Clark, G.A. *Selective, high-channel-count intrafascicular peripheral nerve interfaces.* Reliable Neural-Interface Technology PI Meeting. Austin Tx. 14 December 2011.
103. Clark, G.A. *Restoration of Sensory and Motor Function via Neural Prostheses.* Spinal Cord Injury Outreach Program, Salt Lake City, UT. Invited Presentation. April 2012.
104. Clark, G.A. *Restoration of Sensory and Motor Function via Neural Prostheses.* Spinal Cord Injury Outreach Program, Salt Lake City, UT. Invited Presentation. 8 May 2012.
105. Clark GA. *It Takes a Lot of Nerve: Using the Utah Slanted Electrode Array to Restore Sensorimotor Function.* Invited presentation. State of the Science Symposium. Regenerative Medicine and the Impact on Rehabilitation. Walter Reed National Military Medical Center. 11 May 2012.
106. Clark, GA, Ethier, C, Sachs, NA, Ledbetter, NM Warren, DJ, Frankel MA, Souza, JM, Miller, LE. *Restoring Sensorimotor Hand Function by Stimulating and Recording from Monkey Arm Nerves with Utah Slanted Electrode Arrays.* Selected presentation. Neural Interfaces Conference, Salt Lake City UT. June 18, 2012.
107. Clark, GA, Ledbetter, NM, Ethier, C, Sachs, NA, Souza, JM, Miller, LE. *Restoring Sensorimotor Hand Function by Selectively Activating and Recording From Monkey Arm Nerves.* Invited Presentation. Medical Health Systems Research Symposium, Fort Lauderdale, FL. 14 August 2012.
108. Clark, GA. *It Takes a Lot of Nerve: Using the Utah Slanted Electrode Array to Restore Sensorimotor Function.* Invited presentation. Comparative Medicine Symposium. Park City, UT. 15 Sep 2012.
109. Clark, GA, Bradley Greger, G, Hutchinson, DT, Normann, RA, Miller, LE. *Selective, High-channel-count Intrafascicular Peripheral Nerve Interfaces.* Invited Presentation. DARPA RE-NET meeting, New Orleans, 14 November 2012.
110. Clark, GA. *In the Beginning: Welcome and Overview of R. Normann's Accomplishments.* Presentation. Festschrift for Richard A. Normann, University of Utah, 8 February 2013.
111. Clark, GA. *It Takes a Lot of Nerve: Using the Utah Slanted Electrode Array to Restore Sensorimotor Function*. Presentation. Festschrift for Richard A. Normann, University of Utah, 8 February 2013.
112. Clark, G.A. *What U Mean, "Monster"? A Neuroengineer's Perspective.* Invited Presentation (and Discussant). Workshop on the Nature of the Monstrous in Academe. University of Utah, 12 April 2013.
113. Clark, G.A. *Restoration of Sensory and Motor Function via Neural Prostheses.* Spinal Cord Injury Outreach Program, Salt Lake City, UT. Invited Presentation. April 2013.
114. Clark, G.A. *Mind, Brain, and God: A Scientific Perspective.* Atheists of Utah. 3 November, 2013.
115. Clark, G.A. *Near-threshold infrared stimulation of Xenopus sciatic nerve activates fast Aα fibers.* Poster presenter (Page, D.M. and Keller, M. Co-authors). Society for Neuroscience. 13 November 2013.
116. Clark, G.A. *Selective, High-channel-count Intrafascicular Peripheral Nerve Interfaces.* DARPA Program Review. Invited Presentation, Scottsdale, AZ. 13 February 2014.
117. Clark, G.A. '*Sez Who?' The Neurobiology of Decision Making*. Invited Presentation. Utah Symposium on Science and Literature, University of Utah, 6 March 2014.
118. Clark, G.A. *Restoration of Sensory and Motor Function via Neural Prostheses.* Invited Presentation, Spinal Cord Injury Forum, 15 May 2014.
119. Clark, G.A. *Restoring Motor and Sensory Function with Utah Slanted Electrode Arrays in Human Residual Arm Nerves after Long-term Amputations*. Invited Presentation, Neural Interfaces Conference 2014, Dallas TX, 25 June 2014.
120. Clark, G.A. *Using multiple high-count electrode arrays in residual arm nerves to restore sensorimotor function after hand amputation.* Platform Presentation. Military Heath Systems Research Symposium 2014, Fort Lauderdale FL, 18 August 2014.
121. Clark, G.A., *Assisting Wounded Warriors: Restoring Motor and Sensory Function via Neural Prostheses. Northwest Regional Civilian Aides to the Secretary of the Army (CASA) Conference.* Invited Presentation. Camp Williams, Bluffdale, Utah. 27 August 2014.
122. Clark, G.A. *Using Multiple High-Count Electrode Arrays in Human Median and Ulnar Nerves to Restore Sensorimotor Function after Previous Transradial Amputation of the Hand.* Engineering in Medicine and Biology Society Conference. Chicago, IL. 28 August 2014.

123. Clark, G.A. *Ethics, Smethics. Why Bother?* 4th Annual Bioengineering Leadership Retreat, University of Utah, Salt Lake City, UT 13 Sep 2014.
124. Clark, G.A. *Mind, Brain, and God 1.* Invited presentation. Unitarian Universalists, Salt Lake City, UT. Oct. 20, 2014.
125. Clark, G.A. *Mind, Brain, and God 2.* Invited presentation. Unitarian Universalists, Salt Lake City, UT. Nov. 3, 2014.
126. Clark, G.A. *It Takes a Lot of Nerve: Restoring Sensorimotor Function after Spinal Cord Injury or Hand Amputation.* SCI Research Update Meeting. Invited Presentation. Salt Lake City. 15 November 2014.
127. Clark, G.A. *Restoration of Sensory and Motor Function via Neural Prostheses.* Invited Presentation, Spinal Cord Injury Forum, May 6, 2015.
128. Clark, G.A. *It Takes a Lot of Nerve: Restoring Sensorimotor Function after Limb Loss or Spinal Cord Injury.* James R. Swenson, MD Scientific Symposium and Research Day, University of Utah, Keynote address. May 21, 2015.
129. Clark, G.A. *Restoring sensory function after upper-limb loss via microstimulation of residual nerve fibers with Utah Slanted Electrode Arrays*. Society for Neuroscience 2015, #456.06. 456. Brainy and Handy: What Robotics and Prosthetics Can Learn from Touch Receptors in the Hand.
130. Clark, G.A. *Restoring Motor and Sensory Function after Long-Term Hand Amputation in Humans via Utah Slanted Electrode Arrays*. 2015. Pew Scholars Meeting.
131. Clark, G.A. *Mind, Brain, and God: Are Science and Religion Compatible?* Invited presentation. Senior Freethinkers (Sandy, UT), January 27, 2016.
132. Clark, G.A. Panelist. Leo After Hours--Bionic Human. Mar. 10, 2016. http://www.theleonardo.org/event/leo-after-hours-bionic-human/
133. Clark G.A. *Restoring motor and sensory function via neural prostheses.* Salt Lake City Spinal Cord Injury Forum Outreach. Invited presentation. 4 May 2016.
134. Clark, G.A. *Mind, Brain, and God: Are Science and Religion Compatible?* Invited presentation. Salt Lake City Oasis, 22 May 2016. https://www.facebook.com/saltlakeoasis/posts/1460825923932510
135. Clark GA. *It takes a lot of nerve: Restoring cutaneous and proprioceptive somatosensory function with nerve stimulation after long-term amputation of the hand.* Invited pentation, University of Michigan, Sep. 29, 2016.
136. Clark G.A. *Restoring cutaneous and proprioceptive somatosensory function with nerve stimulation after hand amputations.* Invited presentation. 4th International Conference on Medical Bionics, Brisbane Australia, Nov. 2016.
137. Clark, G.A. *It takes a lot of nerve: Restoring cutaneous and proprioceptive somatosensory function with nerve stimulation after hand amputations.* Invited presentation, University of Queensland, Nov. 2016.
138. Clark, G.A. *Goodness without Godness: Being good for goodness' sake.* Invited presentation. Northern Wasatch Oasis, December 4, 2016. https://www.meetup.com/NORTHERN-WASATCH-OASIS/events/235884525/
139. Clark G.A. Panelist, Patient Voice—World Religions. University of Utah, Charles J. Nabors Conference series. January 25, 2017. http://bit.ly/2kF3wCX
140. Clark, G.A. *It takes a lot of nerve: Restoring sensorimotor function in humans after long-term amputation of the hand.* Brain Bee, University of Utah. Invited presentation. 28 January 2017.
141. Clark, G.A. *Restoring Motor Function After Long-Term Amputation of the Hand.* HAPTIX PI meeting (with David Warren). Invited Talk/Keynote, Presented, 02/2017.
142. Clark, G.A. *Restoring Sensory Function in Humans After Long-Term Amputation of the Hand*. HAPTIX PI meeting. Invited Talk/Keynote, Presented, 02/2017.
143. Clark, G.A. *Metrics: Embodiment and Phantom Pain Reduction*. HAPTIX PI meeting. Invited Talk/Keynote, Presented, 02/2017.
144. Clark G.A. *It takes a lot of nerve: Restoring sensorimotor function in humans after long-term amputation of the hand.* Invited presentation. University of Utah 2017 Brain Initiative Symposium, March 3, 2017.
145. Clark G.A. Panelist, Leonardo Museum, Salt Lake City. *Science and art conversations at the Leonardo: The cultural impact of military and biomedical innovations.* March 10, 2017. http://www.theleonardo.org/event/science-art-conversations-leonardo/

146. Clark, G.A. *What I teach & do: My life—and yours—at the U.* University of Utah. Invited outreach presentation. 6 April 2017.
147. Clark, G.A. *Miracles, morals, and medicine: Why God won't heal amputees (but maybe people can).* Atheists of Utah, 23 April 2017. https://www.youtube.com/watch?v=KIRa39IUkII
148. Clark, G.A. *Restoring sensorimotor hand function in humans after long-term amputation of the hand*. Invited presentation, 14th Annual World Congress for Society for Brain Mapping & Therapeutics Congress, Los Angeles, CA, 19 April 2017.
149. Clark G.A. *Restoring motor and sensory function via neural prostheses.* Salt Lake City Spinal Cord Injury Forum Outreach. Invited presentation.10 May 2017.
150. Clark, G.A. *High-resolution, real-time motor control of prosthetic hands in humans after long-term amputation*. Myoelectric Conference. Fredericton, New Brunswick, Canada. Podium presentation. August 15, 2017.
151. Clark, G.A. *Restoring Sensorimotor Function after Upper-limb Loss.* Translational Neuroscience Social Hour. Other, Presented, 12/07/2017.
152. Clark, G.A. *Using the LUKE (Skywalker) Arm: Restoring Motor and Sensory Function after Hand Amputation.* UoU COE Engineering Scholars Program, 2017. Invited presentation.
153. Clark, GA. *Restoring Sensorimotor Function after Limb Loss.* Brain Bee. University of Utah. 27 Jan 2018. Invited presentation and demonstration. Outreach, Community Engagement.
154. Clark, G.A., Reith, L., Warren D.J., Duncan, C.C. (Shared presentation.) *Embodied Neuroprostheses.* HAPTIX meeting, Charleston SC, 12 Feb 2018. Invited Presentation.
155. Clark, G.A. (with Paskett, M.D.) *Restoring Sensorimotor Function after Limb Loss.* University of Utah, Utah Global Familiarization Visit.18 April 2018. Invited presentation. International outreach.
156. Clark G.A. *Restoring motor and sensory function via neural prostheses.* Salt Lake City Spinal Cord Injury Forum Outreach.3 May 2018. Invited presentation. Community Engagement.
157. Clark, G.A. *Restoring Sensorimotor Hand Function after Amputation for Complex Regional Pain Syndrome.* Society for Brain Mapping and Therapeutics. Los Angeles, CA. 14 April 2018. Invited Presentation.
158. Clark, G.A. *Restoring sensorimotor hand function with intrafascicular high-count electrode arrays after hand amputation*. Innovations in Amputation Surgery and Prosthetic Technologies, Second International Symposium. May 10-12, 2018, Vienna Austria. Invited podium presentation.
159. Clark, G.A. (with Davis, T.S., Paskett, M.D., and Hansen, T.C.) American Society for Engineering Education, Salt Lake City, UT, June 24-27, 2018. Presentation materials (video looped) and 3-d demonstration wearing and using LUKE prosthetic arm with bypass prosthetic socket and surface EMG control, and with portable Nomad belt-pack computer/information processor. Invited presentation.
160. Clark, G.A. (with Paskett, M.D., and Brinton, M.) *Restoring Sensorimotor Function after Limb Loss.* University of Utah, Keio University Visit, 3 August 2018. Invited presentation and demonstration. International Outreach.
161. Clark, G.A. *Luke Skywalker: From Science Fiction to Real-World Science and Engineering*. Natural History Museum of Utah. *The Science of Invention Festival.* Also, with Jake George: Day-long demonstration and interaction with museum visitors showing control of LUKE prosthetic arm, exhibition devices, and discussing our research approaches. 11 August 2018. Invited keynote presentation. Outreach, community engagement.
162. Clark, G.A. *Restoring high-resolution, biofidelic somatosensory feedback in humans after hand amputation*. Hand, Brain and Technology: The Somatosensory System. CSF Conference, Monte Verità, Switzerland. August 26–31, 2018. Invited keynote presentation. https://www.ethz.ch/content/dam/ethz/special-interest/hest/rehabilitation-engineering-lab-dam/images/Events/HBT2018/HBT_2018_Conference_Booklet.pdf. (Cut-and-paste into browser).
163. Clark, G.A. (with George, J.A. and Brinton, M.). *Embodied Neuroprostheses: Initial Subjects.* DARPA D60 meeting. National Harbor, MD. September 5-7, 2018. Invited, presentation materials (video looped) and 2-d demonstration with HAPTIX subject with implanted neuromyoelectric devices (USEA and EMG assembly), wearing and using LUKE prosthetic arm and portable Nomad belt-pack computer/information processor.

164. Clark, G.A. *Restoring Motor and Sensory Function after Hand Amputation: Overview and Recent Progress.* Neural Engineering Research Group, University of Utah. 25 Sep 2018. Invited presentation.
165. Clark, G.A. *Luke Skywalker: From Science Fiction to Real-World Science and Engineering.* FIRST LEGO League visit, University of Utah, 26 Oct 2018. Invited presentation. Community engagement, outreach.
166. Clark, G.A. and Walgamott, K. (Shared presentation with HAPTIX subject.) *Restoring High-Resolution, Biofidelic Somatosensory Feedback in Humans after Hand Amputation.* Society for Neuroscience, EPhys Lounge, Blackrock Microsystems. 5 Nov 2018. Invited presentation.
167. Basic Translational-Clinical Roundtables. *Neuroprosthetic Devices: A Patient's Perspective*. Society for Neuroscience, San Diego, CA. 6 Nov 2018. G. Clark role: Presentation materials, patient support for panelist K. Walgamott. Invited presentation.
168. Clark, G.A. *Using the LUKE (Skywalker) Arm: Restoring Motor and Sensory Function after Hand Amputation.* UoU COE Engineering Scholars Program, 15 Nov 2018. Invited presentation.
169. Clark, GA. *Restoring Sensorimotor Function after Limb Loss.* Brain Bee. University of Utah. 23 Feb 2019. Invited presentation and demonstration. Outreach, Community Engagement.
170. Clark, GA. *Restoring Motor and Sensory Function After Spinal Cord Injury Using Peripheral Nerve Interfaces*. Invited presentation, 14th Annual World Congress for Society for Brain Mapping & Therapeutics Congress, Los Angeles, CA, 17 March 2019. Invited presentation.
171. Clark, GA. *Toward a Real-world Luke Skywalker: Restoring Sensorimotor Function after Limb Loss*. American Preparatory Academy: Presentation, lab tour, and demonstrations. Invited participation. 3 May 2019. Outreach, Community Engagement.
172. Clark, GA. *Toward a Real-world Luke Skywalker: Restoring Sensorimotor Function after Limb Loss.* University of Utah Rehabilitation Day: Presentation, lab tour, and demonstrations. 6 June 2019. Invited participation. Outreach, Community Engagement.
173. Clark, GA. *Neuroengineering: More Satisfying than Even Underoos.* University of Utah, Camp Neuro. Brief presentation and panel discussion. 1 August 2019. Invited participation.
174. Clark, GA. *Toward a Real-world Luke Skywalker: Restoring Sensorimotor Function after Limb Loss.* Keio University visit. Presentation, lab tour, and demonstrations. 6 August 2019. Invited participation. International Outreach.
175. Clark, GA. *Toward a Real-world Luke Skywalker: Restoring Sensorimotor Function after Limb Loss. Oasis, SLC. 10 August 2019.* Invited presentation. Outreach, Community Engagement.
176. Clark, GA. *Toward a Real-world Luke Skywalker: Restoring Sensorimotor Function after Limb Loss.* Draper Women's Prison Neuroscience Class. 16 October 2019. Invited presentation. Outreach, Community Engagement.
177. Limb Difference Night. 26 Nov 2019 Lab group demonstrations of myoelectric control of prosthetic arm, motion capture system, etc. Outreach, Community Engagement.
178. Clark, GA. A New Hope: Restoring Naturalistic Sensorimotor Function After Hand Amputation. Florida Atlantic University, 21 January 2020. Invited Presentation.
179. Silicon Slopes Tech Summit. 20-21 Jan 2020. Invited demonstrations of myoelectric control of prosthetic arm, motion capture system, etc. Outreach, Community Engagement.
180. Clark, GA. *Toward a Real-world Luke Skywalker*: *Restoring Sensorimotor Function after Limb Loss.* Brain Bee. University of Utah. 15 Feb 2020. Invited presentation and demonstration. Outreach, Community Engagement.
181. Clark, GA. *A new hope: Restoring naturalistic sensorimotor function after hand amputation*. North Carolina American Society of Mechanical Engineers, Oct. 2020. Invited presentation.
182. Clark, GA. *Toward a real-world Luke Skywalker: Restoring naturalistic sensory and motor function after hand amputation.* Univ. of Utah COE Engineering Day. Nov. 2020. https://www.coe.utah.edu/engineering-day-videos/, "Luke Arm"
183. Clark, GA. *Biomimetic Sensorimotor Control of a Dexterous, Sensorized Bionic Arm*. Society for Brain Mapping & Therapeutics, 9 July 2021. Invited presentation.
184. Clark, G.A. *Biomimetic Sensorimotor Control of a Sensorized, Dexterous Bionic Arm.* ICCAS, Jeju Korea, Oct. 12, 2021. Invited presentation.
185. Clark, G.A. *How to Obtain DoD/DARPA Funding...and Keep It.* "Faculty Success Seminar". Dept. Mechanical Engineering, University of Utah, Dec 3 ,2021. Invited presentation.

186. Clark, G.A. *Handy Tips for Translational Neuroscience & Neurotechnology*. T-32 Workshop, University of Utah, Jan. 25, 2022. Invited presentation.
187. Clark, G.A. *A New Hope: Restoring Naturalistic Sensorimotor Function after Hand Amputation.* Ogden Surgical Medical Society, May 20, 2022. Invited keynote presentation.
188. Clark, G.A. *Restoring Biomimetic Sensorimotor Function after Hand Amputation.* Biomimicry Society, Univ. of Utah, Sep 20, 2022. Invited presentation.
189. Clark, GA*. A New Hope: Restoring Naturalistic Sensorimotor Function after Hand Amputation.* Engineering Solutions for Better Health: Middle-School Educators, University of Utah, 25-July-2023. Invited presentation.
190. Clark, G.A. *Restoring Naturalistic Sensorimotor Function after Hand Amputation: Progress, Lessons Learned, and Future Prospects.* Biologic Input-Output Solutions (BIOS) Town Hall, 21-Sep-2023. Invited presentation.
191. Clark, GA. *A New Hope: Restoring Naturalistic Sensorimotor Function after Hand Amputation.* Department of Biomedical Engineering, University of Utah. *BME 3091 Current Research in BME,* 17 Jan 2024. Invited presentation.
192. Clark, GA. *Handy Tips for Translational Neuroscience & Neurotechnology.* T-32 Workshop. University of Utah, 22-Jan-2024.

Selected Other Presentations at Scientific Meetings

Society for Neuroscience, 1978
Society for Neuroscience, 1982
Society for Neuroscience, 1983
Nerve Net, 1983
Society for Neuroscience, 1984
Society for Neuroscience, 1986
Society for Neuroscience, 1993
Society for Neuroscience, 19953
Society for Neuroscience, 1997
Society for Neuroscience, 2000
Society for Neuroscience, 2001
Society for Neuroscience, 2002
Society for Neuroscience, 2003
Dynamical Neuroscience, 2003
Society for Neuroscience, 2004
Friday Harbor Laboratories, University of Washington, 2004
Dynamical Neuroscience, 2004
Mountain West Biomedical Conference, 2005
Society for Neuroscience, 2005
Society for Neuroscience, 2007
Society for Neuroscience, 2009
(Updates discontinued post 2009)

6. Selected Additional Recent Postdoctoral, Student and Collaborator Presentations

2017

1. J. S. Joyner, H.L. Benz, D.T. Kluger, D.M. Page, S.M. Wendelken, T.S. Davis, J.A. George, G.A. Clark, E.F. Civillico, “Quantitative Virtual Reality Test Platform for Sensate Prosthetic Hands,” FDA Science Symposium, Silver Spring, Maryland, June, 1, 2017.
2. J. Nieveen, S. M. Wendelken, T. S. Davis, D. T. Kluger, D.M. Page, J. A. George, C. C. Duncan, D. T. Hutchinson, V. J. Mathews, D.J. Warren, G. A. Clark, Channel Selection of Neural and Electromyographic Signals for Decoding of Motor Intent,” Myoelectric Control Symposium, Fredericton, New Brunswick, August 15-18, 2017. (Poster)
3. J. A. George, D. T. Kluger, D. M. Page, S. M. Wendelken, T. S. Davis, C. C. Duncan, D. T. Hutchinson, G. A. Clark, “Providing High-resolution Tactile and Proprioceptive Somatosensory

Feedback in Humans After Long-term Amputation of the Hand," Myoelectric Control Symposium, Fredericton, New Brunswick, August 15-18, 2017. (Podium)

4. S.M. Wendelken, T.S. Davis, C. Duncan, D.T. Kluger, J. Nieveen, D.M. Page, J.A. George, D.T. Hutchinson, D.J. Warren, G.A. Clark, "High Degree-of-Freedom Control of Virtual and Robotic Prosthetic Hands Using Surface EMG," Myoelectric Control Symposium, Fredericton, New Brunswick, August 15-18, 2017. (Podium)
5. J. A. George, D. T. Kluger, D. M. Page, S. M. Wendelken, T. S. Davis, C. C. Duncan, D. T. Hutchinson, G. A. Clark, "High-resolution Somatosensory Feedback in a Human Amputee Allows Sensorimotor Discrimination, Increases Prosthesis Embodiment, and Reduces Phantom Pain," Society for Neuroscience, Washington, DC, November 11-15, 2017. (Poster)
6. J. A. George, D. T. Kluger, D. M. Page, S. M. Wendelken, T. S. Davis, C. C. Duncan, D. T. Hutchinson, G. A. Clark, "High-resolution Somatosensory Feedback in a Human Amputee Allows Sensorimotor Discrimination, Increases Prosthesis Embodiment, and Reduces Phantom Pain," Society for Neuroscience, Washington, DC, November 11-15, 2017. (Podium)
   Selected for SfN Press Conference, "Advances in Neuroprosthetics and Robotics Enrich Lives" and here
7. D. T. Kluger, S. M. Wendelken, J. A. George, T. S. Davis, C. C. Duncan, D. T. Hutchinson, D. J. Warren, G. A. Clark, "Performance of Tasks with Closed-loop Control of Sensorized Prosthetic Hands by a Transradial Amputee with Peripheral Nerve and Intramuscular Implants," Society for Neuroscience, Washington, DC, November 11-15, 2017. (Podium)
8. N. R. Olsen, J. A. George, D. T. Kluger, C. C. Duncan, G. A. Clark, "Development of a 3D-printed, Lightweight, Inexpensive, and Adaptable Prosthetic Wrist," Utah Bioengineering Conference, Salt Lake City, UT, December 8, 2017. (Poster)
9. M. D. Paskett, J. A. George, J. G. Nieveen, M. R. Brinton, C. C. Duncan, G. A. Clark, "A Novel Bypass Prosthesis Enabling Use of Surface Electromyography Decodes in Intact Humans," Utah Bioengineering Conference, Salt Lake City, UT, December 8, 2017. (Poster)
10. J. A. George, D. T. Kluger, D. M. Page, S. M. Wendelken, T. S. Davis, C. C. Duncan, D. T. Hutchinson, G. A. Clark, "Closed-loop Control of a Dexterous, Sensorized Prosthetic Hand by a Transradial Amputee with Peripheral Nerve and Intramuscular Implants," Utah Bioengineering Conference, Salt Lake City, UT, December 8, 2017. (Podium)

2018

1. J. A. George, D. T. Kluger, D. M. Page, T. S. Davis, Z. C. Thumser, P. D. Marasco, E. V. Okorokova, Q. He, S. J. Bensmaia, D. T. Hutchinson, C. C. Duncan, G. A. Clark, "Restoring Sensorimotor Hand Function with Intrafascicular High-count Electrode Arrays after Hand Amputation," Neural Interfaces Conference, Minneapolis, MN, June 25-27, 2018. (Poster)
2. D. T. Kluger, J. A. George, M. R. Brinton, T. S. Davis, D. T. Beckler, P. D. Marasco, C. C. Duncan, D. T. Hutchinson, G. A. Clark, "Providing Intuitive and Dexterous Control of a Neuroprosthetic Hand," Neural Interfaces Conference, Minneapolis, MN, June 25-27, 2018. (Poster)
3. M. R. Brinton, J. A. George, T. S. Davis, M. D. Paskett, D. T. Kluger, C. C. Duncan, D. T. Hutchinson, G. A. Clark, "Non-painful Sensation and Control of an Advanced Prosthetic Hand Following CRPS and Trans-radial Amputation," Neural Interfaces Conference, Minneapolis, MN, June 25-27, 2018. (Poster)
4. B. Baker, R. Caldwell, D. Crosland, R. Sharma, D. Kluger, J. A. George, A. Harding, L. Rieth, "Improving Long-term Performance of Utah Arrays in the Periphery," Neural Interfaces Conference, Minneapolis, MN, June 25-27, 2018. (Poster)
5. J. A. George, M. R. Brinton, C. C. Duncan, D. T. Hutchinson, G. A. Clark, "Improved Training Paradigms and Motor-decode Algorithms: Results from Intact Individuals and a Recent Transradial Amputee with Prior Complex Regional Pain Syndrome," International Engineering in Medicine and Biology Conference, Honolulu, HI, July 17-21, 2018. (Podium)
6. D. T. Kluger, C. C. Duncan, T. S. Davis, D. J. Warren, D. M. Page, D.T. Hutchinson, G.A. Clark. "Using High-Electrode-Count Intrafascicular Peripheral Nerve Interfaces for Selective Pain Mitigation." 2018 NYC Neuromodulation Conference and NANS Summer Series, New York NY, August 2018. (Poster presentation, with interview and news article)

https://www.painmedicinenews.com/Multimedia/Article/10-18/Novel-Nerve-Stimulation-Technique-Reduces-Pain-Preserving-Sensory-and-Motor-Functions/53071

7. D.T. Kluger, C. C. Duncan, T. S. Davis, D. J. Warren, D. M. Page, D.T. Hutchinson, G.A. Clark. "Principles of Engineering Neuromodulation Devices: Designing Devices to Stimulate Peripheral Nerves." 2018 NYC Neuromodulation Conference and NANS Summer Series, New York NY, August 2018. (Invited podium) https://www.researchgate.net/publication/327653591_Principles_of_Engineering_Neuromodulation_Devices_Designing_Devices_to_Stimulate_Peripheral_Nerves
8. T. C. Hansen, H. Dantas, J. G. Nieveen, J. A. George, G. A. Clark, D. J. Warren, V. J. Mathews, "Advances in Shared Human-Machine Control for Upper Limb Prostheses," Biomedical Engineering Society Annual Meeting, Atlanta, GA, October 17-20, 2018. (Poster)
9. N. R. Olsen, J. A. George, D. T. Kluger, M. D. Paskett, C. C. Duncan, G. A. Clark, "Development of a 3D-printed, lightweight, inexpensive, and adaptable prosthetic wrist," Biomedical Engineering Society Annual Meeting, Atlanta, GA, October 17-20, 2018. (Poster)
10. M. D. Paskett, N. R. Olsen, J. A. George, D. T. Kluger, M. R. Brinton, T. S. Davis, C. C. Duncan, G. A. Clark, "A Modular Transradial Bypass Socket for Surface Electromyographic Prosthetic Control in Intact Humans," Biomedical Engineering Society Annual Meeting, Atlanta, GA, October 17-20, 2018. (Poster)
11. J. A. George, M. D. Paskett, M. R. Brinton, A. N. Harding, S. Iverson, G. A. Clark, "Using Deep-learning Techniques to Decode Motor Intent from Stable Myoelectric Recordings," Society for Neuroscience Intermountain Chapter, Alta, UT, October 19, 2018. (Poster)
12. J. A. George, M. R. Brinton, T. S. Davis, M. D. Paskett, D. T. Kluger, C. C. Duncan, D. T. Hutchinson, G. A. Clark, "Expanding the Reach of Upper-limb Prosthetics: Restoring Sensorimotor Function after Complex Regional Pain Syndrome, Long-term Hand Disuse and an Elective Transradial Amputation," Society for Neuroscience, San Diego, CA, November 3-7, 2018. (Poster)
13. M. Brinton, E. Barcikowski, M. Paskett, T. Davis, J. Nieveen, D. Kluger, J. A. George, D. Warren, G. A. Clark, "Development of a Portable Take-home System for Control of Advanced Prosthetics," Society for Neuroscience, San Diego, CA, November 3-7, 2018. (Poster)
14. B. Baker, R. Caldwell, D. Crosland, R. Sharma, D. Kluger, J. A. George, A. Harding, L. Rieth, "Improved Long-term Performance of Utah Slanted Arrays in Clinical Studies," Society for Neuroscience, San Diego, CA, November 3-7, 2018. (Poster)
15. J. A. George, M. R. Brinton, T. S. Davis, M. D. Paskett, C. C. Duncan, D. T. Hutchinson, G. A. Clark, "Restoring Sensorimotor Function After Prior Complex Regional Pain Syndrome and an Elective Amputation," Utah Bioengineering Conference, Salt Lake City, UT, December 7, 2018. (Poster)
16. P. C. Colgan, J. A. George, M. R. Brinton, G. A. Clark, "Development of a Motion Tracking Data Glove for Applications in Upper-limb Amputee Rehabilitation," Utah Bioengineering Conference, Salt Lake City, UT, December 7, 2018. (Poster)
17. M. D. Paskett, M. R. Brinton, J. A. George, G. C. Colvin, N. R. Olsen, D. T. Kluger, T. S. Davis, C. C. Duncan, G. A. Clark, "The Bypass Socket: An Invaluable Tool Informing the Development of Upper-Limb Prosthetics," Utah Bioengineering Conference, Salt Lake City, UT, December 7, 2018. (Podium)
18. S. Radhakrishnan, J. A. George, M. D. Paskett, T. S. Davis, G. A. Clark, "Improved Control Algorithms for Low-cost Myoelectric Prostheses," Utah Bioengineering Conference, Salt Lake City, UT, December 7, 2018. (Poster)
19. A. N. Harding, J. A. George, T. S. Davis, M. D. Paskett, M. R. Brinton, S. C. Iverson, G. A. Clark, "Low-cost Surface Electromyography Sleeve for Quick and Repeatable Decoding of Motor Intent," Utah Bioengineering Conference, Salt Lake City, UT, December 7, 2018. (Poster) ***Awarded 1st-place student poster presentation*.**
20. T. C. Hansen, H. Dantas, J. G. Nieveen, J. A. George, G. A. Clark, D. J. Warren, V. J. Mathews, "Shared Human-Machine Control for Upper-limb Prostheses," Utah Bioengineering Conference, Salt Lake City, UT, December 7, 2018. (Poster)
21. D. Hilgart, D. J. Warren, T. Petelenz, G. A. Clark, "Performance of Wireless Utah Slanted

Electrode Arrays in Cat: The SARA-USEA." Utah Bioengineering Conference, Salt Lake City, UT, December 7, 2018. (Poster)

2019

1. Paul Colgan (GA Clark, faculty advisor), "Motion Tracking Glove for Improved Upper-Limb Prosthetic Control,University of Utah, Department of Biomedical Engineering Senior Research Symposium. April 19, 2019. Podium presentation and poster presentation.
2. Garrison Colvin (GA Clark, faculty advisor), "Non-invasive Sensory Feedback for Prosthetic Hands." University of Utah, Department of Biomedical Engineering Senior Research Symposium. April 19, 2019. Podium presentation and poster presentation.
3. Nathaniel R. Olsen (GA Clark, faculty advisor), "An Inexpensive Adaptable Prosthetic Wrist," Department of Biomedical Engineering Senior Research Symposium, April 19, 2019. Podium presentation and poster presentation.
   Awarded 1st place, podium presentation.
4. Anna Neibling Harding (GA Clark, faculty advisor), "A Surface Electromyography Sleeve for Control of Upper Limb Prostheses," Department of Biomedical Engineering Senior Research Symposium, April 19, 2019. Podium presentation and poster presentation.
5. J. A. George, T. S. Davis, M. R. Brinton, M. D. Paskett, C. C. Duncan, D. T. Hutchinson, G. A. Clark, "A Chronic Neuro-Myoelectric Sensorimotor Interface Improves Dexterous Use of a Bionic Arm," Society for Neuroscience, Chicago, IL, October 19-23, 2019. (Poster)
6. M. R. Brinton, E. L. Barcikowski, T. S. Davis, J. A. George, M. D. Paskett, C. C. Duncan, D. T. Hutchinson, G. A. Clark, "Portable Control System Enables Dexterous Home Use of an Advanced Bionic Arm," Society for Neuroscience, Chicago, IL, October 19-23, 2019. (Poster)
7. T. C. Hansen, H. Dantas, J. A. George, G. A. Clark, D. J. Warren, V. J. Mathews, "Shared Controllers Improve Control and Performance of Upper-Limb Prostheses," Society for Neuroscience, Chicago, IL, October 19-23, 2019. (Poster)
8. B. Baker, R. Sharma, R. Caldwell, D. Kluger, J. A. George, A. Harding, D. Warren, L. Reith, "Improvement and Quantitative Analysis of Tip Metal Stability for Utah Slanted Arrays in Long-term Clinical Studies with a Sensorimotor Prosthesis," Society for Neuroscience, Chicago, IL, October 19-23, 2019. (Poster)
9. S. Radhakrishnan, J. A. George, M. R. Brinton, M. D. Paskett, T. S. Davis, G. A. Clark, "Low-Cost Control System Provides Intuitive and Dexterous Myoelectric Control for Bionic Arms," Biomedical Engineering Society, Philadelphia, PA, October 16-19, 2019. (Poster)
10. T. C. Hansen, J. A. George, S. Durrant, J. L. Segil, R. Patel, D. J. Warren, "Self-Aware Prosthetic Hand to Improve Amputees' Dexterity," Utah Biomedical Engineering Conference, Salt Lake City, UT, September 13, 2019. (Podium)
11. T. N. Tully, J. A. George, P. C. Colgan, G. A. Clark, "Quantitative Assessment of Mimicked and Contralaterally Mirrored Movements for Estimating Motor Intent," Utah Biomedical Engineering Conference, Salt Lake City, UT, September 13, 2019. (Poster)
12. S. Iverson, J. A. George, M. R. Brinton, T. S. Davis, G. A. Clark, "Low-Cost, Bluetooth Surface Electromyography Front-End," Utah Biomedical Engineering Conference, Salt Lake City, UT, September 13, 2019. (Poster)
13. S. Radhakrishnan, J. A. George, M. R. Brinton, M. D. Paskett, P. C. Colgan, T. S. Davis, G. A. Clark, "Low-Cost Control System Provides Intuitive and Dexterous Myoelectric Control for Bionic Arms," Utah Biomedical Engineering Conference, Salt Lake City, UT, September 13, 2019. (Poster). ***Awarded 3rd-place student poster presentation*.**
14. T. N. Tully, J. A. George, P. C. Colgan, G. A. Clark, "Quantitative Assessment of Mimicked and Contralaterally Mirrored Movements for Estimating Motor Intent," Utah Biomedical Engineering Conference, Salt Lake City, UT. (Poster). Other, Presented, 09/13/2019. https://doi.org/10.13140/RG.2.2.32708.78722

2020

1. T. N. Tully, C. J. Thomson, G. A. Clark, J. A. George, "Bilaterally Mirrored Movements Significantly Improves Decode Performance with Increased Training Data for Myoelectric Prosthetic Control with Neural Networks," Utah Biomedical Engineering Conference, Salt Lake City, Utah. (Podium). Presentation, Presented, 02/05/2020.
2. J. A. George, T. N. Tully, P. C. Colgan, G. A. Clark, "Bilaterally Mirrored Movements Improve the Accuracy and Precision of Training Data for Supervised Learning of Neural or Myoelectric Prosthetic Control," International Engineering in Medicine and Biology Conference, Montreal, Canada, July 20-24, 2020. (Podium)
3. J. A. George, M. R. Brinton, P. C. Colgan, G. K. Colvin, S. J. Bensmaia, G. A. Clark, "Intensity Discriminability of Electrocutaneous and Intraneural Stimulation Pulse Frequency in Intact Individuals and Amputees," International Engineering in Medicine and Biology Conference, Montreal, Canada, July 20-24, 2020. (Podium). ***1st place, 2020 EMBS Student Paper Competition Award.***
4. T. N. Tully, J. A. George, P. C. Colgan, G. A. Clark, "Improved Training Data for Controlling Bionic Arms with Deep Neural Networks," Neuroscience Engineering Research Group, Salt Lake City, UT. (Podium). Presentation, Presented, 9/29/2020.
5. T. N. Tully, J. A. George, P. C. Colgan, G. A. Clark, "Improved Training Data for Controlling Bionic Arms with Neural Networks," Biomedical Engineering Society, San Diego, CA. (Podium). Presentation, Presented, 10/14/2020. Podium. https://doi.org/10.13140/RG.2.2.30876.72328

2021

1. T. N. Tully, C. J. Thomson, G. A. Clark, J. A. George, "Bilaterally Mirrored Movements Significantly Improves Decode Performance with Larger Training Datasets for Myoelectric Prosthetic Control with Neural Networks," Neuroscience Engineering Research Group, Salt Lake City, Utah. (Podium). Presentation, Presented, 05/06/2021.
2. T. N. Tully, C. J. Thomson, G. A. Clark, J. A. George, "Mirrored Training Improves Motor-Decode for Myoelectric Prosthetic Control with Neural Networks," Biomedical Engineering Society – Podium presentation, Orlando, Florida. (Podium). Presentation, October 8, 2021.
3. Thomson CJ, Clark GA, George JA. A recurrent neural network provides stable across-day prosthetic control for a human amputee with implanted intramuscular electromyographic recording leads. *43rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Published 1 Nov 2021. pp. 6171-6174, doi: 10.1109/EMBC46164.2021.9629580.
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7. Invention Disclosures and Patents

Disclosures

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2. Clark GA, Warren DJ, Ledbetter N. An electrically shielded containment system for high-count electrode arrays. U-4388. Disclosed December, 2008.
3. Clark GA, Warren DJ, Ledbetter N, Towns S. Optimization of electrode impedances for high-count electrode arrays. U-4389. Disclosed December, 2007.
4. Tathireddy P, Rieth L, Clark GA, Normann R, Solzbacher F. Three-Dimensional Penetrating Optical-Electrical Neural Interface for Selective Stimulation and Recording. U-4768. Disclosed November 2009.

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8. Non-invasive, non-penetrating electrodes and minimally-invasive, penetrating electrodes coupled with a portable or non-portable high-frequency electronic stimulator for chronic or acute blocking of peripheral nerve transmission, U-6056. 11/10/2015. Inventors: Christopher Duncan, David M. Page, David T. Kluger, Gregory A. Clark.
9. Use of an Inertial Measurement Unit for Improved Decoding of Intended Hand and Wrist Movements, U-6011. 08/27/2015. Inventors: David T. Kluger, Gregory A. Clark, David J. Warren, Suzanne M. Wendelken, David M. Page, Christopher Duncan, Tyler Davis.
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1. Microelectrode Array System with Integrated Reference Microelectrodes to Reduce Detected Electrical Noise and Improve Selectivity of Activation. **Patent number: US** 8359083 B2. **Type:** Grant. **Filed:** April 2, 2009. **Issued**: January 22, 2013. **Assignee:** University of Utah Research Foundation. **Inventors:** Gregory A. Clark, David James Warren, Noah M. Ledbetter, Marcy Lloyd, Richard A. Normann.
2. System and Method for Electrically Shielding a Microelectrode Array in a Physiological Pathway from Electrical Noise. **Patent Number**: US 8639312 B2. **Type**: Grant. **Filed**: December 10, 2009. **Issued**: January 28, 2014. **Assignee**: University of Utah Research Foundation. **Inventors**: Gregory Arthur Clark, David J. Warren, Noah M. Ledbetter.
3. System and Method for Electrically Shielding a Microelectrode Array in a Physiological Pathway from Electrical Noise (US 8,855,737 B2). **Status**: Issued. **Inventors**: Gregory A. Clark, Noah M. Ledbetter, David J. Warren. **File date**: 12/30/2013; **Issue date**: 10/07/2014. **Assignee**: The University of Utah. Country: United States.
4. Optimization of Electrode Impedances for High-Count Electrode Arrays. **Status:**:Expired (2009)
5. Three-Dimensional Penetrating Optical-Electrical Neural Interface for Selective Stimulation and Recording. **Application number:** 20130046148**. Type:** Provisional. **Filed**: November 9, 2010. **Issued:** February 21, 2013. **Status**: Expired (2012). **Inventors:** Prashant Tathireddy, Loren Rieth, Gregory Arthur Clark, Richard A. Normann, Florian Solzbacher, Steven Blair.
6. Osseointegrated Mount for Prosthetic Limb and Peripheral Nerve Interface. **Patent number**. US 9,308,103 B1. **Type**: Grant. **Filed**: August 20, 2014. **Issued:** April 12, 2016. **Inventors:** David Kluger, Gregory A. Clark David J. Warren, Kent Bachus. Assignee: Inventors.
7. Seal of a subcutaneous connector for high-channel-count peripheral nerve interface applications.. **Status**: Expired (2016). **Type**: Provisional. **Inventors**: David T. Kluger, David J. Warren, Gregory A. Clark. **File date:** 01/15/2015. **Assignee**: The University of Utah. Country: United States.
8. Non-invasive, non-penetrating electrodes and minimally-invasive, penetrating electrodes coupled with a portable or non-portable high-frequency electronic stimulator for chronic or acute blocking of peripheral nerve transmission. **Status:** US Utility Abandoned, 2023.
9. Electronic Nerve Stimulation. **Application number**: US20170281941A1. **Type:** US Application. **File date:** March 31, 2017. **Issued:** October 5, 2017. **Assignee:** The University of Utah Research Foundation. **Inventors:** David M. Page, David T. Kluger, Christopher Duncan, Gregory A. Clark, Zachary Kagan.

10. Electronic peripheral nerve stimulation. **Patent number:** US 10,549,099 B2. **Date of Patent:** Feb.4, 2020. **Type:** US. **Application:** 15/583,568. **File date:** May 1, 2017. **Assignee:** The University of Utah Research Foundation. **Inventors:** David T. Kluger, Christopher Duncan, David M. Page, Gregory A. Clark, Tyler Davis, Suzanne M. Wendelken.
11. A medical device implant carrier for fragile medical implants. **Application number:** WO2018/023026A1. **Status:** Filed Internationally. **Type:** International Application. **File date:** July 28, 2017. **Assignee:** The University of Utah Research Foundation. **Inventors:** David T. Kluger, Gregory A. Clark, Douglas T. Hutchinson, David M. Page, Suzanne M. Wendelken.
12. Medical device implant carrier for fragile medical implants. **Patent Number:** US 11,331,499 B2. **Filed:** 7/28/2017**. Issued:** 5/17/2022. **Assignee**: University of Utah Research Foundation. **Inventors**: David Kluger, Gregory Clark, Douglas Hutchinson, David Page, Suzanne Wendelken
13. Signal processing for decoding intended movements from electromyographic signals. **Application number:** WO2018/026842A1. **Status:** Filed Internationally. **Type:** International Application. **File date:** July 28, 2017. **PCT Pub. Date:** February 8, 2018. **Assignee:** The University of Utah Research Foundation. **Inventors:** Suzanne M. Wendelken, Tyler Davis, David T. Kluger, Christopher Duncan, David J. Warren, David M. Page, Gregory A. Clark.
14. Signal processing for decoding intended movements from electromyographic signals. **Patent Number:** US 11,596,346 B2. **Date of Patent:** Mar. 7, 2023. **Application number**. 16/322,855. **Status:** Issued. **Type:** U.S. **PCT Filed:** Aug. 1, 2017**. PCT No.:** PCT/US2017/044947. **Date:** Feb 1, 2019. **Assignee:** The University of Utah Research Foundation. **Inventors:** Suzanne M. Wendelken, Tyler Davis, David Page, David T. Kluger, David J. Warren, Gregory Clark, Christopher Duncan, Jacob Nieveen**.**

8. FDA approvals

July 10, 2020, FDA EFS-IDE approval received for G190131/A002 (G. A. Clark), "Can an Array of Microelectrodes Implanted in A Human Nerve Record Neural Signals and Provide Sensory Signals for Controlling a Prosthetic Device?"

The University of Utah received FDA approval for an Early Feasibility Study Investigational Device Exemption (EFS-IDE) study to test an advanced neuroprosthetic arm system in humans in a take-home trial. The study is part of the Defense Advanced Research Project Agency's (DARPA's) Hand Proprioception and Touch Interface (HAPTIX) program.

FDA approval of the EFS-IDE study constitutes a critical regulatory step toward a take-home trial with human subjects, in order to provide new first-in-human demonstrations of the HAPTIX system.

The experimental successes and regulatory approvals associated with the HAPTIX system and associated take-home trials also may ultimately facilitate progress and approvals for other potential uses of the neural and muscle implant technologies, the associated hardware and algorithms for the signals, and approaches in the field of neuroengineering. Examples for USEAs in the peripheral nervous system (PNS) include further advances for prosthetic limbs, including integration with bone-implant systems for better attachment of prostheses, and extensions to lower limbs; auditory nerve implants to restore hearing; motor nerve fiber stimulation for reanimating paralyzed limbs after spinal cord injury or stroke, or for bladder control; and mitigation of chronic pain. Because peripheral nerves innervate almost every body part and organ system, there are multiple opportunities to provide clinical benefits for a wide variety of disorders or diseases.

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9. Recent Media Exposure (*Selected Print, TV, Radio and Web Media)*

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2019

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Our July 2019 *Science Robotics* article (above) and related neuroprosthesis studies on restoring dexterous, intuitive motor control of, and biomimetic sensory feedback from, a prosthetic arm generated substantial media coverage. Shortly after publication (as of August 2019), there were some 398 media pickups reaching nearly ½ billion readers world-wide, and totaling approximately $4.5 million in media coverage for the University of Utah (Meltwater analyses). There were also ~128 TV and radio pieces. According to UU COE Public Relations Associate Vincent Horiuchi, "This was easily the most covered research project from any part of the U in at least several years." Multiple longer features have continued to emerge since. According to *Altmetric* analyses, as of January 2021, the Science Robotics article was in the top 5% of all scored research outputs, regardless of publication date; in the top 10 articles published in Science Robotics, regardless of publication date; and in the top 1% of all articles of the same age https://robotics.sciencemag.org/content/4/32/eaax2352/tab-article-info).

A selected subset of articles, newscasts, interviews, and other features is given below.

University of Utah, 2019

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Deseret News (front page), July 24, 2019, Art Raymond. "University of Utah bioengineers advance thought-controlled prosthetics to sense of touch."
CNET, July 25, 2019. Rae Hodge. "The Luke Skywalker arm let an amputee wear his wedding ring again after 17 years."
Smithsonian Magazine, July 26, 2019. Meilan Solly. "Robotic hand restores wearer's sense of touch."
Science Alert, July 26, 2019. Michelle Starr. "This robotic arm inspired by Luke Skywalker has allowed an amputee to feel again."
Mashable. Aug. 6, 2019. (Video.) Danica D'Souza. "This 'Star Wars'-inspired prosthetic arm gives amputees the ability to feel again."
Journal of the American Medical Association, Sep. 10, 2019. Jennifer Abasi. "Better sensation and dexterity for artificial hands."
The Washington Post, Dec. 14, 2019. Payal Dhar. "New prosthetic limbs go-beyond-the-functional to allow people to feel again." https://www.washingtonpost.com/health/new-prosthetic-limbs-go-beyond-the-functional-to-allow-people-to-feel-again/2019/12/13/ac2fac10-d4ca-11e9-86ac-0f250cc91758_story.html
The Salt Lake Tribune, Dec. 19, 2019. Sean P. Means. "University of Utah robotics breakthrough, the LUKE Arm, will be seen at theaters playing 'Star Wars' movie."

Selected national and local TV and radio interviews, 2019

ABC 4 News (TV), July 24, 2019. Sarah Martin. "U of U researchers create prosthetic arm that can feel." Interview with G. Clark and lab.
Fox 13 Now (TV), July 28, 2019. Jordan Hogan. "Bionic arm lets Utah man control it with just his thoughts."
NBC Telemundo (TV, Salt Lake City), July 25, 2019. Interview with G. Clark and lab.
The Carney Show, KRTS (radio, St. Louis, MO), Jul 29, 2019. Interview with G. Clark.
Top of Mind with Julie Rose (radio), Aug. 28, 2019. "Biomedical engineers pave way for prosthetic arm that can move and feel the same as a human arm." Interview with G. Clark and participant Keven Walgamott.
Constant Wonder (radio), Sep. 5, 2019. "Robotic LUKE hand lets amputee feel fingers again." Interview with G. Clark.

Selected social media, 2019

Twitter, Mark Hamill, July 31, 2019.
Reddit, front page, July 25, 2019.

Selected international media, 2019

The London Times, July 25, 2019. Rhys Blakely. 'Luke Skywalker' robotic arm lets amputee feel again."
The Guardian, July 24, 2019. Anna Ploszajski. "'At last I can feel again': robotic hand gives user a sense of touch."
The Independent, July 24, 2019. Mark Waghorn. "Robotic arm named after Luke Skywalker enables amputee to touch and feel again."
Canadian Broadcasting Corporation (CBC), *As it Happens*. Jul. 25, 2019. "This man was able to grasp his wife's hand — and feel it — with new prosthetic technology."
Daily Mail, July 24, 2019. Mary Kakatos. "Robotic arm allows amputee to touch and feel again - using only the power of THOUGHT as fascinating footage shows the real estate agent plucking grapes without crushing them"
Gestión, July 24, 2019. "El 'brazo Luke', una prótesis capaz de coger un huevo sin romperlo."
MedIndia, July 25, 2019. Lakshmi Venkataraman. Novel Technology may Help Amputees Touch and Feel Again."
China.org, July 25, 2019. "U.S. engineers develop robotic arm that can feel things."

Selected international interviews, 2019
talkRADIO, National UK-based radio station, July 25, 2019. Paul Ross interview with G. Clark.
BBC Radio 5 live, Up All Night, Aug. 1, 2019. https://www.bbc.co.uk/programmes/b0070h86 Interview segment with G. Clark: http://bit.ly/31jyfGJ),
Newstalk National Radio in Ireland Aug. 6 2019. Moncrieff show interview with G. Clark.
Canada AMI. 7 Aug 2019. "The LUKE arm." Interview with G. Clark.

Selected additional articles or features, 2019
Fox World Media, "Prosthetic arm that Is motorized has the ability to move with your thoughts and can sense touch."
Tech Xplore, "Motorized prosthetic arm that can sense touch, move with your thoughts."
EurekAlert, "Reach out and touch someone."
Popular Mechanics, "The Star Wars-Inspired Robotic Arm That Gives Amputees a Sense of Touch."
The Robot Report, July 24, 2019. The Robot Report Staff. "LUKE prosthetic arm has sense of touch, can move in response to thoughts."
PhillyVoice, July 25, 2019. John Kopp. "Prosthetic arm named after Star Wars' Luke Skywalker restores sense of human touch."
Medgadget, "World's Most Advanced Prosthetic Now With Sense of Touch."
O&P Edge, "University Engineers Develop Prosthetic Arm That Can Move, Feel."
Interesting Engineering, "New Star Wars Prosthetic Arm Can Sense, Touch, Move With Your Thoughts."
SlashGear, "Prosthetic 'Luke Arm' mimics how a hand feels objects."
LabMate Online, "Can Prosthetics Sense Touch?"
Science Daily, "Motorized prosthetic arm can sense touch, move with your thoughts."
Tech Times, "LOOK: Robotic Arm Named After Luke Skywalker Lets Users 'Feel.'"
Medical Daily, "Prosthetics Breakthrough: Robot Arm Lets User Feel Touch Again."
Science Alert, "This Robotic Arm Inspired by Luke Skywalker Has Allowed an Amputee to Feel Again."
Wonderful Engineering, "LUKE Arm Is A Prosthetic Arm That Can Sense Every Touch."
Ankeny Observer, "The Empire Strikes Back – Luke Skywalker Prosthetic Hands."
News Coed, "University of Utah Students Develop Prosthetic System to Regain Senses."
Singularity Hub, "Moving Beyond Mind-Controlled Limbs to Prosthetics That Can Actually 'Feel.'"
Newz Hook, "'Luke' prosthetic limb promises to restore sense of touch to amputees."
We Are the Mighty, "This 'Star Wars' prosthetic helps amputees touch and feel again."
CBR, "Star Wars: A Luke Skywalker-Inspired Prosthetic Arm Lets Amputee Feel Again."
Online Focus, "'Star Wars'-Prothese lässt Menschen Objekte erfühlen."
CTV News, "Experimental prosthetic arm allows amputees to 'feel' again"
Medscape, "The Week That Wasn't: Bionic Hands, Weaponized Ticks, Wellness Shots."
Express Digest, "Robotic arm allows amputee to touch and feel again – using only the power of THOUGHT."

Gilmore Health, "Motorized Prosthetic Arm That Works With Thoughts Enables Amputee To Sense Touch."

Selected additional variants, 2019

Mirror UK, July 24, 2019. Mark Waghorn. "Brain-controlled robotic arm lets amputee pick grapes and send text messages" (from *The Independent*).

Good News Network, July 24, 2019. "Robotic arm named after Luke Skywalker enables amputee to touch and feel again: 'It almost put me to tears'" (reprinted from UoU COE).

https://tech.rapida.co/scientists-have-created-a-prosthetic-arm-that-lets-patients-feel-touch-again/

Videnskab.dk, July 25, 2019. "Amputeret mand kan føle igen ved hjælp af ny Luke Skywalker-robotarm" (from *The Independent*).

Fox4kc.com WDAF-TV Kansas City, July 25, 2019. "Amputee can feel objects again with prosthetic arm inspired by Luke Skywalker" (from CNN WIRE).

One News Page, July 26, 2019. Joe Davies. "Star Wars-inspired prosthetic lets amputee 'feel' again" https://www.onenewspage.com/video/20190726/11935300/Star-Wars-inspired-prosthetic-lets-amputee-feel-again.htm (with Reuters video).

2020

Silicon Slopes Tech Summit. 20-21 Jan 2020.

Hands of Hope. Eric Stroud. Feel Again. Feb. 13, 2020.

Science, Mar. 4, 2020. Kelly Servick. Minimuscles let amputees control a robot hand with their minds. G. Clark comments on Vu et al., 2020.

The Scientist, March 5, 2020. Abby Olena. Patients try most intuitive hand prosthetics yet in pilot trial. G. Clark comments on Vu et al., 2020.

Lassonde Entrepreneur Institute, Mar. 19, 2020. Making a real "Luke Skywalker Arm.

Utah Business, Apr. 24, 2020. Izzy Howell. The bionic arm of the future is here.

IEEE Pulse, May 7, 2020, Vol. 11 (2). Leslie Mertz. Restoring the sense of touch: From "Sci-Fi dream" to reality.

Cohen Jones and Wyatt Peterson. Science fiction to science fact: Breaking the barrier of human interface technology. UT State Champion & Science/Tech/Medicine Prize (Junior Division); Utah National History Day, 2020.

Materials Research Society Bulletin, May 8, 2020. Jennifer Huber. "Nerve interface provides intuitive and precise control of prosthetic hand (cambridge.org)"

Lasker Awards in Biomedical Research, 75th Anniversary Edition, Lasker Foundation. June 15, 2020. Mitchell Leslie. "Exploring the Nervous System - Lasker Foundation."

Colomba Films (Santiago, Chile), Al Límite de la Ficción, Brazo de LUKE. (At the limit of fiction. The LUKE arm.) July 2020. Interview with participant, and virtual tour of lab and ongoing projects.

UChicago News, Matt Wood. "UChicago neuroscientists expand possibilities for realistic prosthetic limbs." Sep. 9, 2020.

Blackrock Neurotech. FDA Approves IDE For Take-Home Trial Using The DEKA LUKE Prosthetic Arm And Utah Slant Array. Sep. 22, 2020.

Blackrock Neurotech. ClearPoint Neuro, Inc. Announces Multi-Product Joint Development & Option Agreement with Blackrock Microsystems. Sep. 22, 2020.

Triathlete. Dec. 6, 2020. Susan Lacke. "The Science and Controversy of Running Blade Prosthetics."

Communications of the Association for Computing Machinery. Dec. 22, 2020. Samuel Greengard. "A touch of reality."

2021

Zenger. Grainger Laffan. *Cool Hand Luke: Astonishing Star Wars Skywalker Hand For Amputees. June 3, 2021.*

Newsweek. 'Skywalker' Prosthetic Hand Feels Like It's the Real Thing to Amputees. Jun 8, 2021.

Spark: The Life of Electricity and the Electricity of Life. Timothy Jorgensen. Princeton University Press. 23 Nov 2021. (Finalist for the PROSE Award in Popular Science and Popular Mathematics, Association of American Publishers.)
https://press.princeton.edu/books/hardcover/9780691197838/spark

2022

National Geographic Cynthia Gorney, "The Power of Touch." Cover story. June 2022, The audacious science pushing the boundaries of human touch (nationalgeographic.com)

TV: *The College Tour: Medical Innovations at the University of Utah.* June 2022-2023. Featured on the U's home page.) Medical Innovations at the University of Utah | The College Tour - YouTube

9.2. Education, Science, and Engineering (Public Policy)

Vote delayed on Accommodations Policy: Academic Senate Members Struggle to Work out Details of Document. *The Daily Utah Chronicle*, 11 January 2005. http://www.dailyutahchronicle.com/media/paper244/news/2005/01/11/News/Vote-Delayed.On.Accommodations.Policy-831673.shtml?norewrite&sourcedomain=www.dailyutahchronicle.com

The "A" word. *Continuum: The Magazine of the University of Utah,* **15**, 24-28, Fall 2005. http://www.alumni.utah.edu/continuum/fall05/a_word.htm

Testimony at Utah State Board of Education on evolution and intelligent design. School Board: Intelligent Design Isn't. *The Salt Lake Tribune*. 3 September 2005, et al. http://www.ncseweb.org/resources/news/2005/UT/74_evolution_affirmed_in_utah_9_7_2005.asp, http://www.ksl.com/?nid=148&sid=101919, etc.

New Tom Barberi Show on 97.5 FM Talk, KFMS, 14 September 2005. Interview about the teaching of evolution and intelligent design in Utah public schools.

Testimony to Utah Senate Standing Education Committee regarding S.B. 96, *Public Education-Instruction and Policy Relating to the Origins of Life*, January 17, 2006, Channel 5 News.

KSL TV, *Eyewitness News at 5*. Testimony to Utah Senate Standing Education Committee regarding S.B. 96, *Public Education-Instruction and Policy Relating to the Origins of Life*, January 17, 2006. Video: http://www.ksl.com/index.php?sid=151413&nid=148.

Jeffery, D. et al. (signers). Claims made by 'origins of life' supporters don't hold water. *Salt Lake Tribune,* 12 February 2006. www.sltrib.com, Article ID**:** 297755.

Salt Lake Tribune, 4/6/2006, *West the Best at Chess,* http://www.sltrib.com/search/ci_3676790.

Shwartz, M. Darwin Lives. (Cover story.) *Stanford Medicine Magazine*, Summer 2006. Interview. http://mednews.stanford.edu/stanmed/2006summer/evo-main.html.

Branch, G. Anti-Evolution Legislation in Utah. *Reports of the National Center for Science Education*, **25:** 6-8, 2006.

National Center for Science Education Resource. Stanford Medicine: "The Evolutionary War", 9 June 2006. http://www.ncseweb.org/resources/news/2006/US/19_emstanford_medicineem_t_6_9_2006.asp.

Moulton, K. Faith and evolution: Bioengineer relies on science, not faith, for meaning. Profile. *The Salt Lake Tribune.* 13 February 2009. http://archive.sltrib.com/article.php?id=11679705&itype=NGPSID&keyword=&qtype=

Moulton, K. Not all Utahns say 'amen' to National Day of Prayer. Brief interview. *The Salt Lake Tribune.* 6 May 2011. http://www.sltrib.com/csp/cms/sites/sltrib/pages/printerfriendly.csp?id=51752044

Suh, J. Commemorative cross debate is stagnant. Brief Interview. *Daily Utah Chronicle.* 23 November 2011. http://www.dailyutahchronicle.com/?p=2559453

Ukkestad, M. Don't deny theory of evolution in schools. *Daily Utah Chronicle.* April 16, 2012. Interview. http://www.dailyutahchronicle.com/?p=2570934

Rolly, P. U. prof questions religious requirement on job website. *The Salt Lake Tribune*. May 24 2012. http://www.sltrib.com/sltrib/politics/54177758-90/store-smith-street-main.html.csp.

Campbell, Carolyn. The Rainbow Bridge (cover story). *Salt Lake City Weekly*. August 8, 2012. http://www.cityweekly.net/utah/article-51-16318-the-rainbow-bridge.html?current_page=all

Catholic League for Religious and Civil Rights. Bill Donoghue. Utah Professor slams God and Church. Sep. 12, 2016. http://www.catholicleague.org/utah-professor-slams-god-and-church/

Patheos, Friendly Atheist. Hemant Mehta. Utah Professor Slams Mother Teresa's Sainthood: "Rejecting Reality is Not Reason to Rejoice." Sep. 12, 2016. http://www.patheos.com/blogs/friendlyatheist/2016/09/12/utah-professor-slams-mother-teresas-sainthood-rejecting-reality-is-not-reason-to-rejoice/?utm_source=dlvr.it&utm_medium=facebook

The Salt Lake Tribune. Peggy Fletcher Stack. A Sabbath 'church' for Salt Lake City's unchurched? Believe it. It's called Sunday Assembly. Dec. 19, 2016. http://www.sltrib.com/home/4717130-155/a-sabbath-church-for-salt-lake

University, Professional, and Public Service

1. Department Committees and Appointments

Ongoing

Faculty mentor (J. Kubanek), 2-2022-present
RPT reviewer, 2/2022-present
Chair, Ad-hoc Academic Misconduct Committee, 2017-2019; plus ongoing
Graduate Student Admissions Committee, 1998-present; Chair, 1999-2001; Acting Chair, 2004.
Graduate Curriculum Committee, 2000-present
Chair, Graduate Student Fellowship Committee, 1998-1999; Committee member, 1999-present
Department IACUC coordinator, 2000-present
Neuroengineering Track, member, 1995-present

Completed

Faculty Search, Neuroengineering area, ad-hoc committee member, 2022-2023
Chair, Neuroengineering Track (formerly Neural Interfaces Track) & Track Graduate Student Advisor, 1998-12/2019
Departmental RPT Revisions Committee, 9/2014-2015
Faculty Search Committee, 2005-2013
Co-Director, Whitaker Program in Neural Interfaces, 1998-2000
Coordinator, Base Engineering Equipment Fund (BEEF) Award, 1998-2000
Ad-Hoc Undergraduate Curriculum Committee, 1997-1998
Ad-Hoc Graduate Student Requirements Committee, 1998

2. University Committees and Appointments

Ongoing

Conflict of Interest Committee, 7/1/2021-present
Director, Center for Neural Interfaces, 2015-present
Interdepartmental Program in Neuroscience, Faculty Member, 1997-present

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Completed

University Silicon Slopes Technology Summit Planning Committee, 2020-2021
University Senate Ad-hoc Committee on University Holidays and Scheduling Academic Senate Meetings, Nov 2020-March 2021. Authored the Minority Report, arguing against ongoing and proposed religious favoritism in teaching and employment at the University of Utah as a both a conceptual EDI issue and legal issue.
Interdepartmental Program in Neuroscience, Directorate, 2014-2019; 2020 ex officio
Interdepartmental Program in Neuroscience, Curriculum Committee Chair, 2014-2019; 2020 ex officio
Rehabilitation Medicine Advisory Working Group (for Craig H. Neilsen Foundation hospital); Lead, Technology and Neuroengineering Subgroup. 08/2016 - 2019.
General Education Committee, Physical, Life & Applied Sciences Area, 2005-2008
Faculty advisor, UofU student group *Secular Humanism, Inquiry and Freethought*, 2008-2012
Co-Chair, Biology Department Reviewer, 2009
Academic Evaluation and Standards Committee, 2007-2009
USTAR Building Committee (Animal Facilities), 2006-2009
Committee to Address Animal Research Issues, Ad-hoc member, 2006-2007
Institutional Animal Care and Use Committee (IACUC), 1998-2002
Interdepartmental Program in Neuroscience Admissions Committee, 1997-1999

3. Conference Organization and Administration

Society for Brain Mapping and Therapeutics, Neuroengineering Subcommittee: 10/2018-present. 2019 World Congress Spinal Cord Prostheses session: Organization 10/2018-3/2019; Moderator, 3/2019.
Festschrift for Richard A. Normann, University of Utah, Feb 8, 2013 (Organization: 2012-2013)

Neural Interfaces Conference Organizing Committee, University of Utah. June 2012. (Organization: 2010-2012)
Durand D, Clark GA, Conference Session Co-Chairs. Neural Engineering: Peripheral Neural Interfaces. In: Biomedical Engineering Society Annual Fall Meeting, 2007. Los Angeles, CA.
Chair, Memory formation: From short-term to long-term and forgetting, 10th Anniversary Meeting, *Workshop of Invertebrate Neuroscience*, Tokai University Pacific Center, Honolulu, HI, September 2004
Symposium Co-Organizer, "*LTP: From Molecules to Memory?"* University of Utah, May 2000
Symposium Co-Organizer, *Princeton University-UMDNJ Symposium on Learning and Memory*, Princeton University, 1992
Organizer and fundraiser, *Princeton University-American Cyanamid Neuroscience Seminar Series*, 1989-1995

4. Professional Societies: Present and Past Memberships

American Association for the Advancement of Science
Society for Neuroscience
National Center for Science Education
IEEE Engineering in Medicine and Biology Society (EMBS)
SPIE (International Society for Optics and Photonics)

5. Manuscript Review

Behavioral and Neural Biology
Behavioral Neuroscience
Behavioural Processes
Biological Bulletin
Developmental Brain Research
Experimental Brain Research
IEEE Transactions on Neural Systems & Rehabilitation Engineering (pre-2012, 2012)
Journal of Computational Neuroscience
Journal of Neurophysiology
Journal of Neuroscience
Journal of Neuroengineering
Learning and Memory
Medical Biology
Myoelectric Controls Proceedings Spring-Summer 2020, 2022
Nature
Neurobiology of Aging
Neurobiology of Learning and Memory
Psychological Bulletin
Science

6. Grant Review

Congressionally Directed Medical Research Programs, Nov 2023.
National Institute of Health, F31 Postdoctoral Applications Review Panel, February 2014
Also: National Institute of Mental Health; National Science Foundation; Veterans' Administration; Other NIH

7. Utah Community Public Service

See also "Invited Keynote and Other Presentations" and "Recent Media Exposure" above for events and activities since 2014

Educational Involvement & Outreach

See also "Invited Keynote and Other Presentations" and "Recent Media Exposure" above for events and activities since 2014

Unitarian Universalists, Salt Lake City. *Mind, Brain, and God 2.* Invited presentation. Nov. 3, 2014.
Unitarian Universalists, Salt Lake City. *Mind, Brain, and God 1.* Invited presentation. Oct. 20, 2014.
Spinal Cord Injury Forum, Salt Lake City, *Restoration of Sensory and Motor Function via Neural Prostheses.* Invited presentation, 2014.
Atheists of Utah. *Mind, Brain, and God: A Scientific Perspective.* Invited Presentation. 3 November, 2013.
Spinal Cord Injury Forum, Salt Lake City, *Restoration of Sensory and Motor Function via Neural Prostheses.* Invited presentation, 2013.
Brain Awareness Week, Neuroprosthesis Expert, Leonardo Museum, March 2013
Spinal Cord Injury Forum, Salt Lake City, *Restoration of Sensory and Motor Function via Neural Prostheses.* Invited presentation, 2012.
West High Alliance, Co-spokesperson, 2011-2012
Pod-cast Commentaries on Utah Education Network "Sci-Fi Fridays", *Brain From Planet Arous. http://www.uen.org/tv/scifi/brain.shtml,* 2011.
Spinal Cord Injury Forum, Salt Lake City, *Restoration of Sensory and Motor Function via Neural Prostheses.* Invited presentation, 2011.
FIRST Lego League, scientific consultant and interviewee for two student teams, 2011 (winners of the "Overall Core Values" and "Teamworks" awards).
Spinal Cord Injury Forum, Salt Lake City, *Restoration of Sensory and Motor Function via Neural Prostheses.* Invited presentation, 2010.
FIRST robotics, parent mentor, West High School. 2009-10.
Brain Awareness Week. *Restoring Motor and Sensory Function with Interfaces to Muscle, Nerve, and Brain.* Salt Lake City Public Library. Invited presentation, 18 March 2009.
Spinal Cord Injury Outreach Program, Salt Lake City, UT. *Restoration of Sensory and Motor Function via Neural Prostheses.* Invited Presentation. 14 April 2009.
Spinal Cord Injury Forum, Salt Lake City Public Library, *Restoration of Sensory and Motor Function via Neural Prostheses.* Invited presentation, April 7, 2008
West High School, Salt Lake City, *Memory: From Molecules to Mind.* 11 November 2008.
Spinal Cord Injury Forum, Salt Lake City Public Library, *Restoration of Sensory and Motor Function via Neural Prostheses.* Invited presentation, April 7, 2008.
Common Ground: Making Meaning in the Arts and Sciences. Lecture Series, Center for Interdisciplinary Arts and Sciences, University of Utah. *Interfaces to Nerve and Brain.* Invited presentation. 25 Februrary 2008.
Spinal Cord Injury Forum, Salt Lake City Public Library, *Restoration of Sensory and Motor Function via Neural Prostheses.* Invited presentation, 20 March 2007.
Spinal Cord Injury Forum, Salt Lake City Public Library, *Restoration of Sensory and Motor Function via Neuroprostheses*. Invited presentation, 2006.
Pod-cast Commentaries on Utah Education Network "Sci-Fi Fridays", *The Brain That Would Not Die* http://www.uen.org/tv/scifi/brain_die.shtml and *The Atomic Brain* (Spring 2006).
Salt Lake City Public Elementary Schools, Extended Learning Program (ELP). Presented talk and laboratory demonstration to 6th grade ELP students, University of Utah Bioengineering Department, 1997
Salt Lake City Public Elementary Schools, Science and Engineering Day, Assistant, 1998

University of Utah Accommodations Policy, Public Commentary

See also "Invited Keynote and Other Presentations" and "Recent Media Exposure" above for events and activities since 2014

Clark G.A. Religion has no place in U. of U. curriculum policy. Op-ed. *Salt Lake Tribune*, 11 December 2004.
Vote delayed on Accommodations Policy: Academic Senate Members Struggle to Work out Details of Document. *The Daily Utah Chronicle*, 11 January 2005. http://www.dailyutahchronicle.com/media/paper244/news/2005/01/11/News/Vote-Delayed.On.Accommodations.Policy-831673.shtml?norewrite&sourcedomain=www.dailyutahchronicle.com
Clark G.A. Speak to Senate members about Accommodations Policy. Letter to the Editor. *The Daily Utah Chronicle,* 20 January 2005.

Clark G.A. Humanists of Utah, April, 2005. *Accommodating U: A Contrarian's Sincerely-held Beliefs Regarding the University of Utah Accommodations Policy.* http://www.humanistsofutah.org/2005/AccommodatingU_May-05.html; http://www.humanistsofutah.org/2005/AccommodatingU_May-05.pdf

The "A" word. *Continuum: The Magazine of the University of Utah,* **15**, Fall 2005. https://continuum.utah.edu/back_issues/fall05/a_word.htm

Clark, G.A. "Accommodation policy still makes no sense." Op-ed. *The Salt Lake Tribune*, July 26, 2015. http://www.sltrib.com/opinion/2757259-155/op-ed-u-accommodation-policy-still-makes

Teaching of Evolution in Utah Public Schools (*See also "Selected Publications in Lay Press" above for additional writings since 2015.*)

Testimony to Utah State Board of Education. September, 2005. http://www.schools.utah.gov/board/MINUTES/min05sept2.htm

School Board: Intelligent Design Isn't. *The Salt Lake Tribune*. 3 September 2005, et al. http://www.ncseweb.org/resources/news/2005/UT/74_evolution_affirmed_in_utah_9_7_2005.asp

New Tom Barberi Show on 97.5 FM Talk, KFMS, 14 September 2005. Interview about the teaching of evolution and intelligent design in Utah public schools.

Testimony to Utah Senate Standing Education Committee regarding S.B. 96, *Public Education-Instruction and Policy Relating to the Origins of Life*, January 17, 2006, Channel 5 News.

Jeffery D. et al. (signers). Claims made by 'origins of life' supporters don't hold water. *Salt Lake Tribune,* 12 February 2006.

Interview with *Stanford Medicine Magazine,* Summer 2006. Shwartz, M. Darwin Lives. (Cover story.) http://mednews.stanford.edu/stanmed/2006summer/evo-main.html.

Chess Coach/Coordinator in Utah Public Schools

- Arranged the UofU as the venue for the Utah State Jr. High Championship, typically bringing approximately 150 students from 25 schools to campus (2001-2012), and for the Elementary School Championships, bringing approximately 600 students to campus from throughout the state (2008-2012).

- West High School (Jr. High/Extended Learning Program), Salt Lake City, UT; Chess Coordinator, 2000-2010.

  West Jr. High has won the following selected awards:

  - Utah State Jr. High School Chess Championship (Large School), First Place: 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010 (tie).

    Deseret Morning News, 3/28/2006, *West Junior High captures chess title*, http://deseretnews.com/dn/view/0,1249,635194857,00.html)

    Deseret Morning News,4/10/2007, West teams excel at chess tournaments http://www.deseretnews.com/cgi-bin/cqcgi_plus/@plus.env?CQ_SESSION_KEY=TTGCDFUYMDZL&CQ_CUR_DOCUMENT=20&CQ_TEXT_MAIN=YES;

    Salt Lake Tribune, 4/26/2007, *Chess championship: West High School nets two wins. http://www.sltrib.com/archivesearch*
  - Utah Jr. High School 4-person Team Chess Championship, First Place: 2000 & 2001 (format subsequently discontinued)

- West High School (High School Division), Salt Lake City, UT; Chess Coordinator, 2002-2010.

  West High won the following selected awards:

  - Utah State High School Chess Championship (4A Division 2002-2009; 5A 2010). 1st place: 2004, 2006, 2007, 2008, 2009, 2010. 2nd place: 2005.

    Salt Lake Tribune, 4/6/2006, *West the Best at Chess,* http://www.sltrib.com/search/ci_3676790;

    Salt Lake Tribune, 3/27/2006, *3 Schools Declared Champs at Chess, http://www.sltrib.com/search/ci_3642960;*

Deseret Morning News,3/30/2007, West High students tops at chess tourney, *http://www.deseretnews.com/cgi-bin/cqcgi_plus/@plus.env?CQ_SESSION_KEY=TTGCDFUYMDZL&CQ_CUR_DOCUMENT=21&CQ_TEXT_MAIN=YES*

Deseret Morning News,4/10/2007, West teams excel at chess tournaments http://www.deseretnews.com/cgi-bin/cqcgi_plus/@plus.env?CQ_SESSION_KEY=TTGCDFUYMDZL&CQ_CUR_DOCUMENT=20&CQ_TEXT_MAIN=YES;

Salt Lake Tribune, 4/26/2007, *Chess championship: West High School nets two wins.* *http://www.sltrib.com/archivesearch*

- Bonneville Elementary School, Salt Lake City, UT; Chess Instructor and Co-coach, 1999-2004.
  Chess was a formal part of the Bonneville mathematics curriculum. In 2004, I received a commemorative award from Principal C. Ruesch for my contributions to helping to coach the Bonneville Elementary School Chess Team to five Utah State Elementary School Chess Championships 1999-2004. (I subsequently moved my chess-related activities to upper-level public schools.)
  Bonneville Elementary School won the following selected awards:
  - Utah State Elementary School Chess Championship. First Place: 1999, 2000, 2001, 2002, 2004
  - Utah K-3 4-person Team Chess Championship. First Place: 2000
  - Utah K-6 4-person Team Chess Championship 2000, Co-Champion, 2001
  - Utah Jr. High School Championship (Small School). First Place: 2002

.

- Board member, Utah Junior High School State Chess Association, 2006-2010

- Other
  - Utah Jr. High School Chess Championship, Floor Director/Adjudicator, 2002, 2006, 2007
  - Utah Scholastic Open Chess Championship, Floor Director, Grades 1-2, 1999, 2000
  - Utah Scholastic Chess Team Championships, Floor Director, 2001

Other Local Coaching Contributions to Youth Activities

Coach or Assistant Coach, Jr. Jazz Basketball League (grades 5-6), 1997-1999
Coach or Co-Coach, Leopard's Lair (recreational) Soccer League (preK-4th grade), 1997-2002
Head Coach, Tsunami (competition) Soccer League, Boys U-11, 2002-2003