

Robert (Rob) S. MacLeod
Professor of Biomedical Engineering and Internal Medicine

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Personal Data

Name: Robert (Rob) Scott MacLeod
Address: Scientific Computing and Imaging (SCI) Institute
Warnock Engineering Building, Rm 3750.
University of Utah,
Salt Lake City,
Utah, 84112
Place of Birth: Inverness, Nova Scotia
Date of Birth: August 22, 1955
Citizenship: Dual Canadian and U.S.

Education

Date	Degree	Institution
1979	B.Sc., Engineering Physics - with high honors	Dalhousie University, Halifax, N.S., Canada
1985	Diplom-Ingenieur (M.Sc.), Electrical Engineering - with excellence	Technische Universität Graz, Graz, Austria
1990	Ph.D., Physiology and Biophysics	Dalhousie University, Halifax, N.S., Canada
1990–92	Postdoctoral Fellowship	CVRTI, University of Utah, Salt Lake City, Utah

Professional Experience

Full-time Positions

Date	Position	Institution
2012–	Full Professor	Scientific Computing & Imaging Institute Biomedical Engineering Department, University of Utah, Salt Lake City, Utah
2012–	Adjunct Professor Cardiovascular Medicine	University of Utah, Salt Lake City, Utah
2003–2012	Associate Professor with tenure	Scientific Computing & Imaging Institute Bioengineering Department, University of Utah, Salt Lake City, Utah
1999–2003	Assistant Professor (tenure-track)	Department of Bioengineering, University of Utah, Salt Lake City, Utah
1998–2012	Research Associate Professor Internal Medicine/Cardiology	University of Utah, Salt Lake City, Utah
1992–98	Research Assistant Professor Internal Medicine/Cardiology	University of Utah, Salt Lake City, Utah
1997-99	Research Assistant Professor	Department of Bioengineering, University of Utah, Salt Lake City, Utah
1993–97	Adjunct Research Assistant Professor	Department of Bioengineering, University of Utah, Salt Lake City, Utah
1980–86	Research Assistant Professor and Computer Engineer	Institut für Medizinische Physik und Biophysik, Universität Graz, Graz, Austria

Editorial/Review Experience

Granting Agencies

University of Utah Seed Grants
 University of Utah DEPHI Seed Grants
 American Heart Association (Western Affiliate study section 2000–2004)
 National Institutes of Health (NIH): special study sections for BISTI, NCRR P41, NCRR X02,
 NIBIB T32, Software hardening grants
 Health Research Council of New Zealand
 New Zealand Lottery Grants
 Australian Research Council
 The Whitaker Foundation
 Technology Foundation STW, The Netherlands
 Medical Research Council, Great Britain
 Fondation pour la Recherche Médical, France
 The Icelandic Centre for Research, Iceland
 Research Foundation - Flanders, Belgium
 Dutch Technology Foundation (STW), The Netherlands

Austrian Science Fund (FWF), Austria
Natural Sciences and Engineering Research Council of Canada
The Research Council of Norway, Oslo, Norway
The Netherlands Organisation for Scientific Research (NWO)
Michigan State University Research Excellence Fund
Coverage and Analysis Group, OCSQ, Centers for Medicare and Medicaid Services

Journals

Journal of Electrocardiology (editorial board member)
European Soc. Cardiology Digital Health (editorial board member)
IEEE Transactions on Biomedical Engineering
IEEE Transactions on Medical Imaging
IEEE Signal Processing Magazine
IEEE Visualization and Computer Graphics
Journal of the American Association of Cardiologists (JACC)
Annals of Biomedical Engineering
Computers and Biomedical Research
Computer Methods and Programs in Biomedicine
Circulation
American Journal of Cardiology
European Heart Journal
Canadian Journal of Physiology
Institute of Physics Publishing
American Journal of Physiology
Biophysical Journal
Computational and Mathematical Methods in Medicine
EP Europace
Journal of the American College of Cardiology
Medical & Biological Engineering & Computing

Conference Organizing

2022
Computing in Cardiology (CinC) 2022
 President of CinC Board, Conference Organizing Committee, Session Chair
International Society of Computerized Electrocardiology, 2022
 Session Organizer, Poster Judge,
2021
Computing in Cardiology (CinC) 2021
 President of CinC Board, Conference Organizing Committee, Session Chair
International Congress in Electrocardiography, 2021

International Council, Young Investigator Competition Judge, Program Chair, and session chair
Function Imaging and Modeling of the Heart (FIMH) 2021
Program committee, session chair
2020
Computing in Cardiology (CinC) 2020
President of CinC Board, Conference Organizing Committee, Session Chair
International Congress in Electrocardiography, 2020
International Council, Young Investigator Competition Judge, Program Chair, and session chair
Canceled due to COVID-19
International Society for Computerized Electrocardiology (ISCE) 2020
Session organizer and Chair
Canceled due to COVID-19
IEEE Visualization Conference 2020
Spotlight Session organizer and plenary speaker
2019
Computing in Cardiology (CinC) 2019
President of CinC Board, Conference Organizing Committee, Session Chair
International Congress in Electrocardiography, 2019
International Council, Young Investigator Competition Judge, Program Chair, and session chair
Function Imaging and Modeling of the Heart (FIMH) 2019
Program committee, session chair
International Society for Computerized Electrocardiology (ISCE) 2019
Session organizer and Chair
2018
Computing in Cardiology (CinC) 2018
President of CinC Board, Conference Organizing Committee, Session Chair
International Congress in Electrocardiography, 2018
International Council, Young Investigator Competition Judge, Program Chair, and session chair
International Conference on Bioelectromagnetism 2018
Program committee
International Society for Computerized Electrocardiology (ISCE) 2018
Session organizer and Chair
2017
Computing in Cardiology 2017
Member of CinC Board, Poster Competition Chair, Conference Organizing Committee, Session Chair
Functional Imaging and Modeling of the Heart, 2017
Program Committee
International Congress in Electrocardiography, 2017
International Council, Young Investigator Competition Organizer, abstract chair, and session chair
2016
Computing in Cardiology 2016
Member of CinC Board, conference organizing committee, session chair
International Congress in Electrocardiography, 2016
International Council and session chair
2015

Western AFib Symposium, 2015
Session Chair

International Society of Computerized Electrocardiology, 2015
Session organizer and invited speaker

International Congress in Electrocardiography, 2015
International Council and session chair

Noninvasive Functional Source Imaging (NFSI) 2015
Organizing committee and session chair

Computing in Cardiology 2015
Member of CinC Board, conference organizing committee, session chair

2014

Math Biosciences Institute; Integrating Modalities and Scales in Life Science Imaging, 2014
Conference Co-Chair and organizer

Western AFib Symposium, 2014
Co-chair and invited speaker

International Society of Computerized Electrocardiology, 2014
Workshop organizer and invited speaker

International Congress in Electrocardiography, 2014
Program committee, session chair

Computing in Cardiology 2014
Session chair and elected to CinC Board

2013

International Congress in Electrocardiography, 2013
Program committee, session chair and plenary speaker

Functional Imaging and Modeling of the Heart 2013
Program committee

International Society for Biomedical Imaging (ISBI), 2013
Reviewer

Western AFib Symposium, 2013
Co-chair and invited speaker

2012

IEEE Engineering in Medicine and Biology Conference 2012
Track chair, session chair, workshop chair

International Society for Biomedical Imaging (ISBI), 2012
Program committee, session chair, reviewer, Challenge co-chair

Western AFib Symposium, 2012
Co-chair and invited speaker

2011

International Congress in Electrocardiology, 2011
Plenary speaker, session chair, web page support, organization

Functional Imaging and Modeling of the Heart 2011, Reviewer,
minisymposium organizer

2010

Computing in Cardiology 2010
Session chair

International Congress in Electrocardiography, 2010
Session chair and plenary speaker
2000–2009
Computers in Cardiology, 2009
Local organizing committee, Sunday Symposium, Scientific Program
Functional Imaging and Modeling of the Heart, Program Committee, 2009
World Congress on Medical Physics and Biomedical Engineering, 2009
Scientific Program Committee, Track Chair
International Congress on Electrocardiology, 2009
scientific planning committee and session chair
Engineering in Medicine and Biology (EMBS), Track and Session chair, 2008
Engineering in Medicine and Biology (EMBS), Track and Session chair, 2007
International Congress on Electrocardiology, 2007
scientific planning committee and session chair
International Congress on Electrocardiology, 2006
scientific planning committee and session chair
Engineering in Medicine and Biology (EMBS) Track and Session chair, 2006
International Congress on Electrocardiology, 2005
scientific planning committee and session chair
Noninvasive Functional Source Imaging (NFSI) 2005
Organizing committee and session chair
Engineering in Medicine and Biology (EMBS) Track and Session chair, 2005
Engineering in Medicine and Biology (EMBS) Session chair, 2004
International Symposium on Biomedical Imaging (ISBE), Session chair, 2004
International Society for Computerized Electrocardiology, session chair 2003
International Congress on Electrocardiology, 2003
scientific planning committee and session chair
Engineering in Medicine and Biology (EMBS) Session chair, 2002
International Society for Computerized Electrocardiology, session chair 2002
Engineering in Medicine and Biology (EMBS) session chair, 2001
Biomedical Engineering Society (BMES), session chair, 2000

Academic Honors

- 2020– Scientific Advisor for Personalize AF Consortium
- 2020– CVRTI Senior Advisory Council
- 2017 Fellow of the American Institute of Medical and Biological Engineers (AIMBE)
- 2017– President of Computing in Cardiology Society
- 2015– C0-Founder of the Consortium for ECG Imaging
- 1990–92 Heart and Stroke Foundation of Canada Postdoctoral Fellowship
- 1987–90 Medical Research Council of Canada Studentship
- 1986/87 IODE War Memorial Postgraduate Scholarship
- 1986–90 Izaak Walton Killam Memorial Scholarship
- 1980–85 Austrian Student Union Scholarships
- 1979 Dalhousie University Medal in Engineeringg Physics
- 1975–79 Dalhousie University Academic Scholarships

Academic Administrative Experience

University of Utah

Dates	Appointment/Organization	Entity at University of Utah
2022–	Director of Cardiovascular Engineering Track	BME Department
2022–	Teaching Effectiveness Working Group	University of Utah
2022–	Teaching & Learning Portfolio	University of Utah
2022–	DELPHI Group Steering Committee	University of Utah
2022–	Faculty Advisory Committee	
	Center for Teaching Excellence (CTE)	Learning Portfolio
2021–	Preclinical Imaging Core Facility	Univ. of Utah
	Oversight Committee	
2012–	Physics Education Committee (Chair)	College of Engineering
2010–	Graduate Program Committee Member	Biomedical Engineering Department
2006–	Director of Undergraduate Studies	Biomedical Engineering Department
	Associate Department Chair	
2003–	Associate Director	SCI Institute
2020–2022	Equality, Diversity, and Inclusivity Committee	College of Engineering
2007–2021	Small Animal Imaging Core Facility	Univ. of Utah
	Oversight Committee (Chair)	
2003–2020	Associate Director	CVRTI
2019/20	Co-Chair SCI Director Search Committee	Univ. of Utah
2016–20	MD/PhD Committee	School of Medicine
2015–19	RPT Committee Member	Biomedical Engineering Dept.
2014	RPT Guidelines Review Committee	Biomedical Engineering Dept.
2014	Internal Department Review	University of Utah
	of Biomedical Informatics	
2012–14	Faculty Search Committee	Bioengineering Department
2009–2015	Associate Director	University of Utah
	Comprehensive Arrhythmia &	
	MANagement Center (CARMA)	
2003–2006	College Curriculum Committee (Chair)	College of Engineering
2002–2019	Graduate studies track chair	Bioengineering Department
2004	Physiology Chair Search Committee	School of Medicine
2004	Faculty Search Committee	SCI Institute
2003	CVRTI Director Search Committee	School of Medicine
2001–2003	College Council	College of Engineering
2001–2006	Graduate Program Committee	Bioengineering Department
2000–2001	Undergraduate Program Committee	Bioengineering Department
1999–2003	Interim Co-director	CVRTI
1999–2003	Curriculum Committee	College of Engineering
1990–2000	Computer Facilities Management	CVRTI

Other Institutions

Dates	Appointment/Organization	Institution
1987–90	Graduate Education Committee	Department of Physiology and Biophysics, Dalhousie University
1987–90	President, Graduate Student Society	Department of Physiology and Biophysics, Dalhousie University
1988–90	Graduate Education Planning Committee	Department of Physiology and Biophysics, Dalhousie University
1988–90	Space Planning Committee	Department of Physiology and Biophysics, Dalhousie University
1978–79	Vice President, Undergraduate Physics Society	Department of Physics, Dalhousie University

University and Community Activities

2006–2010	Board Member, Emigration Oaks Property Owners Association
2003–2005	Board Member, Utah Symposium in Science and Literature
2001	Judge for Salt Lake Valley Regional Science & Engineering Fair, hosted by the university.
1998–2001	Chair of Salt Lake City Mayor’s Bicycle Advisory Committee
1992–98	Vice Chair of Salt Lake City Mayor’s Bicycle Advisory Committee
1997	Planning Committee for the American Heart Association 1997 “Heart Ride”
1997	Judging Panel, Salt Lake City Urban Design Awards
1997–2000	Coordinator of “Cycle Salt Lake” annual bicycle festival
1994–2010	Board of Trustees, Bonneville Shoreline Trail Committee
1994–96	President, Rocky Mountain Cycling Club
1992–95	University of Utah Parking Services and Public Transportation Advisory Committee
1991–94	University of Utah Campus Bicycle Committee (from 1992 as Chair)
1991–2002	Salt Lake City Mayor’s Bicycle Advisory Committee

Membership in Professional Societies

AIMBE — American Institute of Medical and Biological Engineers (Fellow)
CinC — Computing in Cardiology, 2014 appointed to CinC Board, since 2018 as President
ISE — International Society of Electrophysiology, 2002-2020 Member of ISE Council, 2019 as Secretary
IEEE/EMBS — Engineering in Medicine and Biology Society (Lifetime member)
BMES — Biomedical Engineering Society
HRS — Heart Rhythm Society
ISBEM — International Society of Bioelectromagnetism
ISCE — International Society for Computerized Electrocardiography
ASEE — American Society for Engineering Education

Teaching Responsibilities/Assignments

Courses Taught

Date	Position	Institution
2023–	BIOEN 6000 System Physiology I: Cardiovascular, respiratory, and renal systems Instructor, developer of this new course in systemic physiology for bioengineers. 20–30 students in the class.	Dept. of Biomedical Engineering, University of Utah
2020–2022	BME 4992 Senior Project II Instructor (one of 7) 12-15 senior undergraduate students in the section. Students use their senior research project and learn to present the results in the form of a paper, verbal presentations, and poster. Also learn how to carry out reviews of scientific papers.	Dept. of BME , University of Utah
2014–	BME 2100 Fundamentals of BME II Instructor, course coordinator. 100 sophomore students in the class, which is a prerequisite for admission to the BME program .	BME Department, University of Utah
2012–	BIOEN 6110 Biomedical Technology in Anesthesia and Critical Care Co-course coordinator, and co-developer of this completely novel course in the role of biomedical technology in the clinical settings of the operation room and critical care units. 10 students in the initial year of the class, either graduate students or senior undergraduates.	Departments of BME and Anesthesiology, University of Utah
2015–2019	BME 4720 Intro to Image Based Modeling Co-Instructor, elective course for biomedical engineering students in the technology of image based modeling, including image processing, segmentation, registration, geometric model construction, visualization and simulation.	BME Department University of Utah
2011–2018	BIOEN 6060 (now 7070) Graduate Proposal Writing and Presentation I Instructor, course coordinator, and developer of this completely revised course. 30 in the class, which is required for all PhD students in the Bioengineering program.	Dept. of Bioengineering, University of Utah
2012–2018	BIOEN 6061 (now 7071) Graduate Proposal Writing and Presentation II Instructor, course coordinator, and developer of this completely revised course. 30 in the class, which is required for all PhD students in the Bioengineering program. Second semester of the two-semester series.	Dept. of Bioengineering, University of Utah

Date	Position	Institution
2008–2012	BIOEN 6003 Cellular Electrophysiology and Biophysics Instructor, course coordinator, and developer of this team taught course (4 instructors). 10–12 students in the class. Taught first as a special topics course, this course is now part of the regular Biomedical Engineering curriculum. For more details, see the class web site at http://www.sci.utah.edu/~macleod/be6003/	Dept. of Bioengineering and Physiology, University of Utah
2002–2014	BIOEN 6000 System Physiology I: Cardiovascular, respiratory, and renal systems Instructor, developer of this new course in systemic physiology for bioengineers. 20–30 students in the class. For more details, see the class web site at http://www.sci.utah.edu/~macleod/be6000/	Dept. of Bioengineering and Physiology, University of Utah
2001–2013	BIOEN 6460 Electrophysiology and Bioelectricity Instructor, course coordinator, and developer of this team taught course (4 instructors). 10–12 students in the class. Taught first as a special topics course, this course is now part of the regular Biomedical Engineering curriculum. For more details, see the class web site at http://www.sci.utah.edu/~macleod/be6460/	Dept. of Bioengineering and Physiology, University of Utah
2006–2010	BIOEN 4201 Senior Project I Instructor (one of 4) 35–40 senior undergraduate students in the class. Students use data from a senior research project and learn to present the results in the form of a paper, verbal presentations, and poster. Also learn how to carry out reviews of scientific papers.	Dept. of Bioengineering, University of Utah
2007–2010	BIOEN 4202 Senior Project II Instructor (one of 4) 35–40 senior undergraduate students in the class. Students use data from a senior research project and learn to present the results in the form of a paper, verbal presentations, and poster. Also learn how to carry out reviews of scientific papers.	Dept. of Bioengineering, University of Utah
2001–2005	BIOEN 3202 Physiology II Instructor (40% of lectures), co-developer of this new team taught (2 instructors) undergraduate course. 30 students in the class Course materials available on the WebCT site for the course. University of Utah	Dept. of Bioengineering,

Date	Position	Institution
1993–2001	BIOEN 6010 Principles of Physiology for Bioengineers Instructor (40% of lectures), co-developer, and now coordinator of this team taught (originally 2 instructors, now 6-8). 20-30 students in the class. For more details, see the class web site at http://www.sci.utah.edu/~macleod/be6010/	Dept. of Bioengineering, University of Utah
1981–86	Physics for Medical Students Instructor in team taught laboratory course (8 instructors). 300 students in the class	Institut für Medizinische Physik Universität Graz, Graz, Austria

Teaching awards

1994, 1998, 2008, and 2011: rated in top 15% of all School of Engineering courses in Student Evaluation for one or more courses.

New Courses Developed

All the courses listed above were completely new courses at the time I began them, developed either alone or in collaboration with other instructors. Below is a summary of those courses and their goals:

Medical Physics: my role in this course was to help develop a complete set of laboratory exercises for the 600–700 medical students who enter the program at the Karl-Franzens University in Graz, Austria. In the traditional European manner, only the department chair held the formal lectures with the students while the rest of the faculty created and carried out the laboratory exercises and engaged in more informal mentoring of students. After helping develop the course material, I taught and refined them for the next six years.

BIOEN 6010: Principles of Physiology for Bioengineers this course was originally listed as BIOEN 562, one quarter of a year-long course about systems medical physiology. Together with Patrick Tresco, and Ken Horch, and the support of a Whitaker Development Award to the department, we developed a complete systems level physiology course specifically for bioengineering graduate students. Subsequent years saw a reorganization of the course to match the requirements of the semester system, Greg Clark replacing Ken Horch for three years, and then the additional assistance from members of the Physiology Department. The course served for two years as a requirement for the Neurosciences Program and is now the core Physiology course required for both Bioengineering and Physiology graduate students. The goals of the course remain to explain the principles of human physiology from the perspective of a quantitative scientist and engineer. The course therefore consists not only of traditional presentations of material from physiology but also the development of simulation and modeling approaches to physiology. The students perform their own simulations of, for example, the electrical activity of a cardiac cell or the mechanical distur-

tion of a vessel during pulsatile blood flow. For more details, see the class web site at <http://www.sci.utah.edu/~macleod/be6010/>

BIOEN 3202: Human Physiology II this is the second half of a new undergraduate level physiology course series created in collaboration with Greg Clark and Russell Stewart for the new undergraduate Bioengineering program at the University of Utah. Our goals with this course are to capture for the students the essence of a functional approach to physiology, to present physiology as living systems solving engineering problems in order to cope and prosper. I will teach in the spring semester of this course, which we are now offering for the first time. The class web site was within the WebCT system and thus not available for general access.

BIOEN/Physiol 6003: Cellular Electrophysiology and Biophysics this is an advanced graduate level course in cellular electrophysiology and biophysics, also offered for the first time this fall semester of 2008. Developed together with John Bridge, Mike Sanguinetti, Frank Sachse, Steve Poelzing, and Alonso Moreno, this course seeks to build on the basic material in the core physiology course (BIOEN 6000 and 6010) and develop a deeper understanding of electrophysiology and membrane and cellular levels. We are using a mixture of lectures, lab exercise, and homework assignments to expose students to a wide range of measurement methods, mechanisms, and numerical simulation methods. The class web site is <http://www.sci.utah.edu/~macleod/be6003>.

BIOEN/Physiol 6460: Electrophysiology and Bioelectricity this is an advanced graduate level course in electrophysiology and bioelectricity, also offered for the first time this fall semester of 2001. Developed together with John Bridge, Mike Sanguinetti, and Eric Sobie, this course seeks to build on the basic material in the core physiology course (BIOEN 6000 and 6010) and develop a deeper understanding of bioelectricity. We are using a mixture of lectures, lab exercise, and homework assignments to expose students to a wide range of space and time scales in order to explain how electrical signals one can measure on the body surface ordinate in the flow of nanoscale currents through the membranes of excitable cells. The class web site was <http://www.sci.utah.edu/~macleod/be6460>.

BIOEN/Physiol 6000: System Physiology I Cardiovascular, respiratory, and renal systems. This is a core graduate Bioengineering course first offered in the Spring 2002 semester. The material derives from the previous BIOEN 6010 course but with a new focus and elevated level. The goal of this course is to understand the concepts and mechanisms of systemic cardiovascular physiology based on a survey of a variety of animal systems. The course assumes a basic knowledge of human physiology and builds on that knowledge by examining the adaptation of other species to meet their challenges and maintain homeostasis. There is substantial emphasis on engineering approaches, quantitative methods, and simulation. The web site or the course is <http://www.sci.utah.edu/~macleod/be6000/>.

BIOEN 7070: Presentations I This is a complete revision of an existing class to expand content and revamp the approach used to teach graduate students presentation, writing, and specifically grant proposal skills. The class builds on basic skills for both written and oral presentation skills and then refines them for the specific application to a research proposal. This is

a required class for all graduate students in the program. The class is based on multiple revisions and frequent feedback, video recording and analysis of presentations, and peer review with the goal of developing the broadest possible skills in communication of scientific ideas.

BIOEN 7071: Presentations II This is a continuation of BIOEN 6060.

BIOEN/Anesthes. 6110: Biomedical Technology in Anesthesia and Critical Care This is a completely novel and to our knowledge unique offering, made possible through a collaboration with the Department of Anesthesiology with the goal of exposing graduate students and senior (typically pre-medical) undergraduates to the principles and practice of instrumentation and technology in clinical medicine. This is a team taught course developed together with a clinical attending physician in Anesthesiology that includes lectures on topics such as anesthesia, respiratory monitoring, cardiovascular monitoring, state of consciousness, and the current state of monitoring equipment in both the modern and developing worlds. The course also includes multiple sessions in the operating room and critical care units in which students pair with individual clinical mentors for direct exposure to the clinical settings.

BIOEN 4702: Introduction to Image Based Modeling Goals for the undergraduate course include 1) Introduce students to the basic practice of handling, manipulating, visualizing, and analyzing images from biomedical sources; 2) Prepare students to participate in image based research projects by training them in the use of contemporary software tools; and 3) Expose students to research opportunities in the broad domain of biomedical imaging. The course emphasizes self-guided and peer-assisted, hands-on practical time with the software and data examples. Formal lectures (1 per week) provide introduction to the core ideas and the software. Finally, a series of guest lectures from scientists from the University provides informative examples of the use of imaging and image based modeling and analysis in biomedical research.

Mentored Undergraduate Research Students

Undergraduate Students

Name	Date	Current Activity
Azadeh Poursaid	2004–2006	Medical School, University of Utah
Jason Woodbury	2005–2006	Unknown
Jared Christensen	2006–2007	Unknown
Brett Burton	2006–2008	PhD Student, University of Utah
Jess Tate	2007–2009	PhD Student, University of Utah
Jesse Merkley	2007–2009	M.S. Student, University of Utah
Swati Rao	2007–2010	Medical School, University of Utah
Eric Fish	2007–2008	Undergraduate Student, University of Utah
Shawn Tate	2008–2010	Medical School, Loyola University
Tyler Marler	2009–2012	Medical School
Christopher Gloschat	2008–2011	Engineer with Abbott Medical
Arash Poursaid	2009–2018	Completed BS/MS Degree
Greg Gardner	2009–2011	M.S. in BME, then Medicine
Joel Pieper	2010–2012	Medical School
Spencer Thurman	2010–2011	Unknown
Abby Reyes	2010–2012	Unknown
Myron Lance	2011–2013	Medical School
Vince (Vargha) Payandeh	2011–2012	Unknown
Abby Reyes	2010–2012	Unknown
Douglas Handley	2010–2011	Medical School
Jackson Murphy	2011–2013	Medical School
Jason Jenson	2011–2013	Medical School
Wes Albright	2011–2013	Applying for Medical School
Derek Chang	2011–2013	Applying for Medical School
Hannah Treadway	2012–2014	Medical School
Joshua Schwermer	2011–2013	Entrepreneur
Andrew Miller	2012–2015	Graduated
Kara Ann Johnson	2013–2016	In Bioengineering PhD program (U of U)
Brian Zenger	2012–2015	Admitted to MD/PhD program 2015
Spencer Frisby	2013–2015	Unknown
Minna Wang	2014–2016	Graduated
Karli Gilette	2013–2015	PhD Program, Graz, Austria
Derek Hu	2013–2014	Applying to medical school
Alex Gerber	2013–2017	Industry
Brianna Kindall	2014–2015	On mission
Sam Massey	2016–2018	Unknown
Anterpreet Kaur	2016–2017	Intern at Bard
Devan Anderson	2017–2018	Intern In Progress
Lindsay Rupp	2017–2018	PhD Student (with me)
Maura Perez	2017–2019	Applying to Medicine
Nathan Vance	2019–2021	Completing BS Degree

Undergraduate Students (continued)

Name	Date	Current Activity
Josh Larsen	2020–2020	Completing BS
Andie Sieja	2019–2022	Completed BS
Ben Orkild	2019–2022	In Progress with UROP support, now in PhD
Anna Busatto	2020–2021	Completing BS and joining PhD program with UROP support
Olivia Walker	2020–	In Progress with UROP support
Lyndsey Schultz	2021–2022	Completing BS
Derek Lewis	2021–	in progress
Tanner Frahm	2021–	in progress with UROP support
Ben Orkild	2019–2021	Now in PhD Program
Aksel Anderson	2022–	In progress
Rui Jin	2022–	In progress
Lauren Anderson	2022–	In progress

Postdoctoral Fellows

Name	Date	Field of activity	Current Status
Rok Hren	1997–99	Simulation of cardiac electrophysiology, geometric modeling	Head of Laboratory Diagnostics, Adriatic Region, Siemens Medical.
Stefan Gumhold	2000–01	Geometric modeling and mesh generation research	Prof., Univ. of Tuebingen
Xinlong Wang	2000–02	Geometric modeling and mesh generation research	Industry
Jeroen Stinstra	2002–07	Multimodal cardiac imaging	NVIDIA
Carsten Wolters	2004–05	Neuroelectric source localization	Associate Prof. University of Muenster
Xavier Tricoche	2004–07	Vector field visualization and topology	Associate Prof. Purdue Univ.
Jens Krueger	2008-09	Volume visualization	Professor, U of Duisburg, Germany
Mike Steffen	2009–2010	Simulation of Bioelectric fields	Boeing
Josh Cates	2010–2012	Image analysis	Director of Research, Orthogrid
Moritz Dannhauer	2011–2017	Simulation and Mathematical Modeling of Bioelectric fields	Duke University
Darrell Swenson	2012–2013	Image Based Support for Clinical Ablation Procedures.	Medtronic Inc.
Jess Tate	2019–	Image Based Modeling	In progress
Matthias Lange	2021–	Cardiac EP Modeling	In progress

Graduate Students: Main Advisor

Current Students

Biomedical Engineering Department Students

Name	Level	Date	Thesis Title	Status
1) Jake Bergquist	PhD	2018–	ECG Imaging and Simulation	In progress
2) Lindsay Rupp	PhD	2020–	Uncertainty Quantification in ECG Imaging	In progress
3) Anna Busatto	PhD	2021–	Cardiac modeling	In progress.
4) Eric Paccione (co-advisor)	PhD	2022–	Cardiac Electrophysiology	In Progress
5) Ben Orkild (co-advisor)	PhD	2022–	Cardiac Electrophysiology	In Progress

Medical Students

Name	Date	University	Project
James Brundage	2021–	University of Utah	Machine Learning in ECG Analysis

Past Students: Main/Co-Advisor**Biomedical Engineering Department Students: Past**

Name	Level	Date	Thesis Title	Current Status
1) Prasad Gharpure	Ph.D.	1991–96	A Cellular Automaton Model of Electrical Wave Propagation in Cardiac Muscle	Nortel Networks Inc.
2) Ruth Klepfer	Ph.D.	1992–1998	Effects of Tissue Conductivity on Forward and Inverse Problems	Medtronic, Inc., Minneapolis
3) Quan Ni	Ph.D.	1995–2000	Interpolation in Three-Dimensional Cardiac Fields	Inspire Medical Systems
4) Richard Kuenzler	M.Sc.	1996–98	Estimation of Epicardial Potentials from Percutaneous, Multielectrode Catheter Measurements	Boston Scientific
5) Laura Traynor	M.Sc.	1999–2002	Medical image distortion correction	Jomed, Sacramento, CA
6) Bulent Yilmaz	Ph.D.	2000–2004	Estimation of epicardial activation	Vice Rector for Education, Abdullah Gül University, Turkey
7) Bruce Hopenfeld	Ph.D.	2000–2004	Simulation of cardiac electrophysiology	Angel Medical Systems
8) Andrew Shafer	M.Sc.	2002–2003	Geometric error in bioelectric forward problems	Industry
9) Lucas Lorenzo	M.Sc.	2002–2004	Multimodal cardiac imaging	Hemisur, Santiago, Chile
10) Zoar Englemann	M.Sc.	2002–2006	Drug induced repolarization abnormalities	Coridea, Inc.
11) Shibaji Shome	Ph.D.	2000–2007	Electrocardiography of myocardial ischemia	Boston Scientific
12) Seok Lew	Ph.D.	2004–2008	Inverse source localization in the brain	Assoc. Prof Olivet University
13) Lindsey Healy	Ph.D.	2006–2009	Cardiac MRI	Left program
14) Darrell Swenson	Ph.D.	2007–2012	Simulation of myocardial ischemia	Medtronic
15) Greg Gardner	M.S.	2011–2013	Image analysis for atrial fibrillation	Medical Residency

Biomedical Engineering Department Students: Past

Name	Level	Date	Thesis Title	Current Status
16) Mette Lindegaard	MS	2013–2014	Image registration for guidance in atrial ablation	Novo Nordisk A/S, Copenhagen, Denmark
17) Josh Blauer	Ph.D.	2007–2015	Atrial fibrillation	Medtronic
18) Kedar Aras	Ph.D.	2007–2015	Myocardial Ischemia	Postdoctoral fellow GWU
19) Karli Gillette	MS	2015–2016	Geometric modeling and simulation of cardiac bioelectric fields.	In PhD program in Graz, Austria
20) Ayla Khan	M.S.	2012–2017	Shape analysis of cardiac structure	ARUP
21) Brett Burton	Ph.D.	2008–2018	Simulation of myocardial ischemia	Consultant
22) Jess Tate	Ph.D.	2009–2017	Simulation of defibrillation in patient specific models	Technical Manager, SCI Institute
23) Wilson Good	Ph.D.	2014–2020	Signal analysis in myocardial ischemia	Lead Scientist at Acutus Medical Inc.
24) Brian Zenger	MD/PhD	2017–2021	Acute ischemia and ECG Imaging	Entering Medical Residency program

Medical Students: Past

Name	Date	University	Project
Rob Oakes	2007–2008	University of Utah	Quantification of MRI based fibrosis in AF patients.
Brett Walker	2010–2011	University of Utah	Shape statistical analysis of left atrial shape.
Quinn Tate	2013	University of Utah	Development of blood loss monitoring system for the OR.

As Committee Member

Current Students

Biomedical Engineering Department Students: Current

Name	Level	Date	Thesis Title	Status
1) Santosh Balakrishnan	Ph.D.	2005–		In Progress
2) Srinath Lingutla	Ph.D.	2005–		In Progress
3) Cameron Jacobson	Ph.D.	2008–		In Progress
4) Annie White	PhD	2017–	His bundle mapping	In Progress
5) Lars Lofgren	PhD	2019–	kidney function during surgery	In Progress
6) Jiawei Dong	PhD	2019–	Atrial Fibrillation	In Progress
7) Eugene Kwan	PhD	2018–	Atrial fibrillation	In Progress
8) Bram Hunt	PhD	2019–	Atrial fibrillation	In Progress
9) Caleb Berggren	PhD	2020–	Computation fluid mechanics	In Progress
10) Samer Merchant	PhD	2020–	MRI DW Imaging	In Progress
11) Yifan “Jack” Wang	PhD	2020–	Computation fluid mechanics	In Progress
12) David Jiang	PhD	2021–	Computation fluid mechanics	In Progress
13) Andrea Corbin	PhD	2021–	Cardiac Electrophysiology	In Progress
14) Qi Huang	PhD	2021–	Cardiac MRI	In Progress
15) Jade Bookwalter	PhD	2022–	Cardiac Metabolism	In Progress
16) Vu Nguyen	PhD	2022–	Cardiac Heart Failure	In Progress
17) Trey Blackwell	PhD	2022–	Anesthesiology	In Progress
18) Sofia Ruiz	PhD	2022–	Heart Failure	In Progress
19) Emmanuel Offei	PhD	2022–	Cardiac Heart Failure	In Progress

Other Department Students: Current

Name	Level	Department	Date	Thesis Title	Current Status
1) Dennis Njeru	PhD		2020–	Visualization of Uncertainty	In Progress
2) Henry Crandall	PhD		2022–	Bioelectric Impedance	In Progress

Past Students**Biomedical Engineering Department Students: Past**

Name	Level	Date	Thesis Title	Current Status
1) Anton Bowden	Ph.D.	1998–2003	Image registration tools	Professor at Brigham Young Univ.
2) Harshali Khare	Ph.D.	1999–2004	Quantitation with low count dynamic cardiac SPECT	
3) Richard Shelton	M.Sc.	2000–2003		
4) Girish Bal	Ph.D.	2000–2003		Post Doctoral Fellow, Penn State University
5) Yinqi Zheng	Ph.D.	2000–2004	Integrated information display for anesthesia monitoring	Private industry
6) Christopher Butson	Ph.D.	2000–2003		Assoc. Prof. Medical College of Wisconsin
7) Rachane Visaria	Ph.D.	1999–2004	Cardiovascular pulmonary mechanics and gas exchange modeling	Post Doctoral Fellowship
8) Dosik Hwang	Ph.D.	2002–2005	Iterative Reconstruction for SPECT emission and transmission measurements	Post Doctoral Fellowship
9) GyuTae Kim	M.E.	2002–2005	Filtering Signals & Detecting Peak Values in QRS Complex	Unknown
10) Ken Olree	Ph.D.	2002–2004	Magnetically Induced Unidirectional Action Potentials	Assist. Prof., Harding University, Searcy, AR
11) Michelle Dalton	M.Sc.	2003–2004	Mechanics of the Medial Collateral Ligament in Normal and ACL deficient Knee	Alta View Hospital

Biomedical Engineering Department Students: Past (continued)

Name	Level	Date	Thesis Title	Current Status
12) Brad Stoker	M.S.	2004-2005	Morphological Parameters of Cervical Carotid Imaging with MR	Law School
13) Alex Brownell	M.S.	2005-2006	Turn Counting as a Clinical Alternative to Fiber Density Studies in Quantitative Electromyography	Medical School
14) PJ Hawkes	M.S.	2005-2006	Micro CT Imaging of Transgenic Mice	Medical School
15) Ben Randell	M.S.	2005-2006	Characterizing Respiratory Depression and Airway Obstruction for Remifentanil and Propofol Combinations	Medical School
16) Michael Sherman	M.S.	2005-2006	Non-Invasive Measurement of Functional Residual Capacity by CO ₂ Rebreathing and N ₂ Washout	Medical School
17) David Sutherland	M.S.	2006-2007	Quantifying Ventricular Activation Timing and Synchrony	Medical School, University of Utah
18) Sandeep Choudary	Ph.D.	2003-2006	Modeling and Monitoring Anesthetic Effect	Post Doctoral Fellowship
19) Philip Blood	Ph.D.	2002-2007	Simulation of molecular dynamics	Unknown
20) Olinto Linares	Ph.D.	2003-2007	Signal processing of EEG signals	Post Doctoral Fellow, University of Utah
21) James Pinkston	M.S.	2006-2007		Industry
22) Karah Morley	M.S.	2006-2007		Unknown
23) In Suk Joung	Ph.D.	2007-2009		Postdoctoral fellowship
24) Nate Pack	Ph.D.	2005-2008	Cardiac MRI	Unknown
25) Kwanghyun Sohn	Ph.D.	2006-2010	Cardiac mapping	PDF at MGH, Boston

Biomedical Engineering Department Students: Past (continued)

Name	Level	Date	Thesis Title	Current Status
26) Matthias Görge	Ph.D.	2007–2010	Signal processing, human factors, and modeling to support intensive care unit bedside care	University of British Columbia
27) Katie Brenneman	Ph.D.	2008–2009		Howard Hughes Medical Institute
28) Jacob Fluckinger	Ph.D.	2007–2010	Cardiac MRI	PDF at Vanderbilt University
29) Tammy Anderson	M.S.	2008–2010	Unknown	
30) Alex Brownell	Ph.D.	2009–2010	Neuroprosthetics	Industry
31) Brad Isaacson	Ph.D.	2007–2010	Osseointegration	Boston Scientific
32) Jay Christopherson	M.S.	2008–2010		
33) Rengasayee Veeraraghavan	Ph.D.	2005–2011	Heterogeneity in cardiac cellular electrophysiology	Postdoc at University of Utah
34) Cris Lapierre	Ph.D.	2006–2012	Dosing strategies for multi-anesthetics	Postdoc at MGH, Boston
35) Lara Brewer	Ph.D.	2006–2011		Res. Assist. Professor of Anesthesiology, University of Utah
36) Christina Long	M.S.	2010–2011	Capnogram waveform simulator	Industry
37) Brett Dowden	Ph.D.	2006–2011	Recording and decoding neural signals	Industry
38) Amara Greer-Short	PhD	2011–2012	Effect of diabetes on calcium handling in the heart	Moved with advisor to new institution
39) Sharon George	PhD	2011–2012	Cytokine Inflammation on the Conduction Velocity in the heart	Moved with advisor to new institution
40) Neda Sadegh	Ph.D.	2008–2103	Image processing	Post Doc
41) Yanfei Mao	Ph.D.	2011–2014	Medical Image Acquisition and SPECT	
42) Paul Moore	M.S.	2011–2013	Course only MS degree	Industry
43) Joseph Hinkle	PhD	2010–2014	The Study of Shape Change in Organ Motion and Shape Regression	
44) Josh Silvernagel	M.Sc.	2011–2014	Simulation of atrial fibrillation	Industry (Biosence-Webster)
45) Paul Venable	PhD	2011–2014	Ventricular fibrillation	Industry (Physio Control)

Biomedical Engineering Department Students: Past (continued)

Name	Level	Date	Thesis Title	Current Status
46) Anh Pham	MS	2017–2018	Detecting post-operative airway obstruction using pulse oximeter waveform patterns and frequency.	Industry
47) Yanfei Mao	PhD	2011–2014	SPECT imaging	Postdoctoral fellowship
48) Tyson Taylor	PhD	2011–	Role of ischemia in ventricular fibrillation	Industry (Blackrock)
49) Bradley Zentgraf	MS	2012–	Course only MS degree	Industry
50) Andrew Willsie	PhD	2012–2015	Deep Brain Stimulation	Industry
51) Preethi Sankaranarayanan	PhD	2011–2014	Matrix and Tensor Comparisons of Genomic Profiles	
52) Avantika Vardhan	Ph.D.	2010–2015	Image Processing	
53) Chris Welsh	PhD	2011–2015	Compressed Sensing reconstruction of MR DTI	
54) Nathan Angel	PhD	2012–2016	Role of Purkinje system in ventricular fibrillation	Accutis Medical
55) Osamma Abdulah	PhD	2012–2016	DTI Imaging	Postdoctoral fellow
56) Justin Lichter	PhD	2012–2015	Confocal microscopy for cardiac electrophysiology	Postdoctoral fellow
57) Caleb Rottman	PhD	2013–2016	Image reconstruction	
58) Carl Tams	Ph.D.	2007–2015	Modeling of Respiration and Blood Pressure	
59) Kyungpyo Hong	PhD	2015–	MRI Imaging	Industry
60) Katie Aiello	PhD	2016–2017	Comparative matrix modeling of genomic data	Genentech
61) Chris Conlin	MS	2015–2018	MRI of kidneys	Lab Manager, U of Utah
62) Cody Maughan	MS	2017-2018	Genetic signal processing	Unknown
63) Michael Fogarty	PhD	2012–2017	Electric Blower Based Portable Emergency Ventilator	CTO, AccuBreath

Biomedical Engineering Department Students: Past (continued)

Name	Level	Date	Thesis Title	Current Status
64) Spencer Madsen	PhD	2012–2017	Respiration Measurement	Completed with MS, CEO at AccuBreath
65) Jessie France	No degree	2013–2016	Uncertainty in Inverse Problems	Industry
66) Katie Sciuto	PhD	2013–2018	Metabolic disorders in cardiac ischemia	Unknown
67) Sean Ermer	PhD	2013–2020	Portable ventilation in anesthesia	Unknown
68) Rinchen Phuntsok	PhD	2016–2019	Pediatric biomechanics	Research Consultant K2M
69) Kyle Burke	PhD	2015–2019	Biomedical device development	Dynasthetics LLC
70) Elyar Ghafoori	PhD	2015–2019	Cardiac mapping an atrial fibrillation	Acutus Medical
71) Lindsay Schuring	MS	2018-2019	Hip joint kinematics	Unknown
72) Dan Pike	Ph.D.	2010–2019	Blood flow in dialysis AV graft stenosis	Unknown
73) Andrew Janson	PhD	2016–2019	Deep Brain Stimulation	Postdoctoral Fellow, Vanderbilt U.
74) Jordan Johnson	MS	2017–2019	Optical sensing of cardiac conduction system	Medical School
75) Kyle Jeong	PhD	2018–2020	MRI Imaging Methods	Unknown
76) Isabelle Falzon	MS	2019–2020	AV Fistula modeling	Industry
77) Kara Johnson	PhD	2017–2020	DBS Neuromodulation	Postdoctoral at Florida University
78) Nate Knighton	PhD	2017–2020	multi-integrated confocal imaging probes	Industry
79) Roya Kamali	PhD	2017–2020	Simulation of atrial fibrillation	Postdoctoral fellowship Baylor Med.
80) Shana Black	PhD	2017–2021	DBS Neuromodulation	Unknown
81) Azmi Ahmad	PhD	2017–2021	Role of TRPC1 and TRPC6 Channels in cardiac function	In Progress
82) Patrick Kolbay	PhD	2016–2021	Ventilation device for developing world	Postdoctoral Fellow
83) Lorne Hoffstetter	MD/PhD	2017–2021	MR-guided focused ultrasound therapies	MD/PhD in progress
84) Jason C. Huang	MS	2018-2020	Antidepressant therapy	Unknown
85) Chantel Charlebois	PhD	2017-2022	Simulation of neuro-modulation	Pursing Industry Career

Biomedical Engineering Department Students: Past (continued)

Name	Level	Date	Thesis Title	Current Status
86) Bradley Stringer	PhD	2016–2021	Spectroscopy of the Superior Vena Cava and Right Atrium	Industry
87) Elliott Hurd	PhD	2017–2022	Coronary blood flow	Unknown
88) Molly Streiff	PhD	2017–2021	Myocardial cell structure	Industry
89) Thirupura (Anu) Shankar	PhD	2017–2022	Heart failure	AHA Postdoctoral Fellow
90) Sam Colby	MS	2018–2020	Diffusion tensor imaging	Unknown
91) Aparna Chakkalakkal	PhD	2018–2021	Modeling of cardiac conductivity	Industry
92) Ankur Shah	PhD	2018–2020	Ventricular arrhythmias	Industry

School of Computing Students: Past

Name	Level	Date	Thesis Title	Current Status
1) Yarden Livnat	Ph.D.	1994–98	Distributed Graphics Pipelines in Scientific Visualization (Comp. Sci.)	U of Utah, SCI Institute
3) Carol Gitlin	M.Sc.	1993–95	Techniques for Visualizing 3D Unstructured Meshes (Comp. Sci.)	Autometric Inc.
4) James Purciful	M.Sc.	1994–96	Three-Dimensional Widgets for Scientific Visualization and Animation (Comp. Sci.)	Engineering Animation Inc.
5) Feng Yu	M.Sc.	1994–95	An Automatic Adaptive Refinement and Derefinement Method (Comp. Sci.)	EDS/Unigraphics
6) Dean Brederson	M.S.	1995–2005	Haptic Control of Remote Medical Surgery (Comp. Sci.)	unknown
7) Rob van Uitert	Ph.D.	1999–2004	(Comp. Sci.)	NIH staff scientists
8) Milan Itkis	Ph.D.	2000–2006	Virtual Reality and Haptics	Software industry
9) Kris Zyp	M.Sc.	2000–2003		
10) David Weinstein	Ph.D.	1994–2003	Inverse Solutions in Electroencealography (Comp. Sci.)	Numira Bioscience.
11) Sarah Geneser	Ph.D.	2004–2007	Statistical simulation of bioelectric fields	Post doc at Stanford University
12) Dafang Wang	Ph.D.	2006–2012		Inverse Problems in Electrocardiography
13) Zhisong Fu	Ph.D.	2011–2013	GPU implementation of PDE solutions	Industry
14) Gopal Veni	Ph.D.	2013–2016	Automated segmentation of cardiac MRI	Industry
15) Ally Warner	MS	2014–2018	Heading modeling for EEG	SCI Institute

Other Departments: Past

Name	Level	Department	Date	Thesis Title	Current Status
1) Quinn Tate	PhD	Electrical Eng.	2011–2012	Monitoring cardiovascular change.	Abandoned PhD for Medical School
2) Pejman Saberin	MS	CES	2012–14	Simulation of fluid distribution in patients during anesthesia	Industry

External Examiner

Name	Level	Date	Thesis Title	University
1) David Davenport	M.Sc.	1994–95	Temporal, Spatial, and Frequency Constraints on Heart Surface Potential Distributions	Northeastern University
2) Rick Gaudette	M.Sc.	1996–1997	Spatio-temporal Analysis of Epicardial Potentials	Northeastern University
3) Hanson On	M.Sc.	1992–95	Multiresolution Body Surface Potentials Array ECG Signal Analysis of PTCA Induced Ischemia	Northeastern University
4) Ghandi Ahmad	Ph.D.	1992–96	Inverse Electrocardiography by Simultaneous and Iterative Imposition of Multiple Constraints	Northeastern University
5) Leo Cheng	Ph.D.	2001	Noninvasive electrical imaging of the heart	University of Auckland, New Zealand
6) Yesim Serinagaoglu	Ph.D.	1999–2003	Statistical approaches to cardiac inverse problems	Northeastern University
7) Alireza Ghodrati	Ph.D.	2001–2005	Lead selection and wavefront-based models for the inverse problem of electrocardiography	Northeastern University
8) Qin Li	Ph.D.	2005		University of Tasmania
9) Matti Stenroos	Ph.D.	2008	Boundary Element Method in Spatial Characterization of the Electrocardiogram	Helsinki University of Technology
10) Chanchai Thaijiam	Ph.D.	2008	Using Electromagnetic Theory and Numerical Methods to Develop Improved Conductance Catheter Volume Measurement	University of Tasmania
11) Juho Väisänen	Ph.D.	2010	Electrode sensitivity	Tampere University of Technology

Name	Level	Date	Thesis Title	University
12) Levi Bassin	Ph.D.	2013	Mechanisms of Cold on Heart Electrophysiology	University of Sydney, Australia
13) Jingjia Xu	PhD	2016	Bayesian Inference with Combined Dynamic and Sparsity Models: Application in 3D Electrophysiological Imaging	Rochester Institute of Technology
14) Matthjis Cluitmans	Ph.D.	2016	Electrocardiographic Imaging	Maastricht University, The Netherlands

Medical Students

Name	Date	University	Project
Rob Oakes	2007–2008	University of Utah	Quantification of MRI based fibrosis in AF patients.
Brett Walker	2010–2011	University of Utah	Shape statistical analysis of left atrial shape.
Quinn Tate	2013	University of Utah	Development of blood loss monitoring system for the OR.
James Brundage	2021–	University of Utah	Machine Learning with ECG signals.

Publications

Peer-reviewed Journals

1. B. Zenger, J.A. Bergquist, A. Busatto, WW Good, LC Rupp, V. Sharma, and R.S. MacLeod. Tipping the scales of understanding: An engineering approach to design and implement whole-body cardiac electrophysiology experimental models. *Front. Physiol.* 14:1100471, 2023.
2. R. Kamali, E. Kwan, M. Regouski, T.J. Bunch, D.J. Dossdall, E. Hsu, R.S. MacLeod, I. Polejaeva and R. Ranjan. Contribution of atrial myofiber architecture to atrial fibrillation. *PloS One* 18:1:e0279974, 2023.
3. A. Narayan, Z. Liu, J.A. Bergquist, C. Charlebois, S. Rampersad, L.C. Rupp, D.H. Brooks, D. White, J.D. Tate, and R.S. MacLeod. UncertainSCI: Uncertainty quantification for computational models in biomedicine and bioengineering. *Comp. Biol. & Med.* 152:106407, 2022.
4. X. Jiang, M. Toloubidokhti, J.A. Bergquist, B. Zenger, W.W. Good, R.S. MacLeod, and L. Wang. Improving Generalization by Learning Geometry-Dependent and Physics-Based Reconstruction of Image Sequences. *IEEE Trans. Med. Imag.* 42:2:403–415, 2023.
5. M. Lange, E. Kwan, D.J. Dossdall, R.S. MacLeod, T.J. Bunch, and R. Ranjan. Case report: Personalized computational model guided ablation for left atrial flutter. *Front. Cardiovasc. Med.* 9:893752, 2022.
6. R. Kamali, K. Gillette, J.D. Tate, D.A. Abhyankar, D.J. Dossdall, G. Plank, T.J. Bunch, R.S. MacLeod, and R. Ranjan. Treatment Planning for Atrial Fibrillation Using Patient-Specific Models Showing the Importance of Fibrillatory-Areas. *Annals Biomed. Eng.* 51(2):329–342, 2022.
7. S. Al-Zaiti, R.S. MacLeod, P Van Dam, S.W. Smith, and Y. Birnbaum. Emerging ECG methods for acute coronary syndrome detection: Recommendations & future opportunities. *J Electrocardiol.* 74:65–72, 2022.
8. J.A. Bergquist, J. Coll-Font, B. Zenger, L.C. Rupp, W.W. Good, D.H. Brooks, and R.S. MacLeod. Reconstruction of cardiac position using body surface potentials. *Comput. Biol. and Med.* 142:105174, 2022.
9. B.S. Orkild, B. Zenger, K. Iyer, L.C. Rupp, M.M. Ibrahim, A.G. Khashani, M.D. Perez, M.D. Foote, J.A. Bergquist, A.K. Morris, J.J. Kim, B.A. Steinberg, C. Selzman, M.B. Ratcliffe, R.S. MacLeod, S. Elhabian, and A.E. Morgan. All Roads Lead to Rome: Diverse Etiologies of Tricuspid Regurgitation Create a Predictable Constellation of Right Ventricular Shape Changes. *Front. Physiol.* 13:908552, 2022.
10. Y. Ishidoya, E. Kwan, D.J. Dossdall, R.S. MacLeod, L. Navaravong, B.A. Steinberg, T.J. Bunch, and R. Ranjan. Shorter Distance Between The Esophagus And The Left Atrium Is

- Associated With Higher Rates Of Esophageal Thermal Injury After Radiofrequency Ablation. *J. Cardiovasc. Electrophysiol.* 33(7):1460–1471, 2022.
11. Y. Ishidoya, E. Kwan, D.J. Dossdall, R.S. Macleod, L. Navaravong, B.A. Steinberg, J.T. Bunch, and R. Ranjan. Short-term natural course of esophageal thermal injury after ablation for atrial fibrillation. *J Cardiovasc Electrophysiol.* 33(7):1450-1459, 2022.
 12. S. Schuler, M. Schaufelberger, L.R. Bear, J.A. Bergquist, M.J.M. Cluitmans, J. Coll-Font, O.N. Onak, B. Zenger, A. Loewe, R.S. MacLeod, D.H. Brooks, and O. Dossel. Reducing Line-of-Block Artifacts in Cardiac Activation Maps Estimated Using ECG Imaging: A Comparison of Source Models and Estimation Methods. *IEEE Trans. BME* 69(6): 2041–2052, 2022.
 13. W.W. Good, B. Zenger, J.A. Bergquist, L.C. Rupp, K. Gillette, N. Angel, D. Chou, G. Plank, and R.S. MacLeod. Combining endocardial mapping and electrocardiographic imaging (ECGI) for improving PVC localization: A feasibility study. *J Electrocardiol.* 69S:51-54. 2021.
 14. W.W. Good, B. Zenger, J.A. Bergquist, L.C. Rupp, K.K. Gillette, M.A.F. Gsell, G. Plank, and R.S. MacLeod. Quantifying the spatiotemporal influence of acute myocardial ischemia on volumetric conduction velocity. *J. Electrocardiol.* 66:86–94, 2021.
 15. J. Salinet, R. Molero, F.S. Schlindwein, J. Karel, M. Rodrigo, J.L. Rojo-Álvarez, O. Berenfeld, A.M. Climent, B. Zenger, F. Vanheusden, JGS Paredes, R.S. MacLeod, F. Atienza, M.S. Guillem, M. Cluitmans, and P. Bonizzi. Electrocardiographic Imaging for Atrial Fibrillation: A Perspective From Computer Models and Animal Experiments to Clinical Value. *Front Physiol* 12:653013, 2021.
 16. C.M. Charlebois, D.J. Caldwell, S.M. Rampersad, A.P. Janson, J.G. Ojemann, D.H. Brooks, R.S. MacLeod, C.R. Butson, and A.D. Dorval. Validating Patient-Specific Finite Element Models of Direct Electroconvulsive Stimulation. *Front Neurosci.* Aug 2;15:691701, 2021.
 17. J Bergquist, L.C. Rupp, B. Zenger, J. Brundage , A. Busatto, and R.S. MacLeod. Body Surface Potential Mapping: Contemporary Applications and Future Perspectives. *Hearts* 2:514–542, 2021.
 18. B. Zenger and W.W. Good. J.A. Bergquist, L.C. Rupp, M. Perez, G.J. Stoddard, V. Sharma, and R.S. MacLeod. Pharmacological and simulated exercise cardiac stress tests produce different ischemic signatures in high-resolution experimental mapping studies. *J Electrocardiol.* 68:56–64, 2021.
 19. B. Zenger and W.W. Good. J.A. Bergquist, L.C. Rupp, M. Perez, G.J. Stoddard, V. Sharma, and R.S. MacLeod. Transient recovery of epicardial and torso ST-segment ischemic signals during cardiac stress tests: A possible physiological mechanism. *J Electrocardiol.*, Nov-Dec;69S:38–44, 2021.
 20. A.S. Rababah, L.R. Bear, Y. Serinagaoglu-Dogrusoz, W.W. Good, J.A. Bergquist, R.S. MacLeod, K. Rjoob, M. Jennings, J. McLaughlin and D.D. Finlay. The effect of interpolating

- low amplitude leads on the inverse reconstruction of cardiac electrical activity. *Comput Biol Med.* Sep;136:104666, 2021.
21. W.W. Good, B.W. Zenger, J.A. Bergquist, L.C. Rupp, K.K. Gillette, N. Angel, D. Chou, G. Plank, and R.S. MacLeod. Combining endocardial mapping and electrocardiographic imaging (ECGI) for improving PVC localization: A feasibility study. *J Electrocardiol.* Nov-Dec;69S:51–54, 2021.
 22. W.W. Good, K.K. Gillette B.W. Zenger, J.A. Bergquist, L.C. Rupp, J.D. Tate, D. Anderson. M. Gsell, G. Plank, and R.S. MacLeod. Estimation and Validation of Cardiac Conduction Velocity and Wavefront Reconstruction Using Epicardial and Volumetric Data. *IEEE Tran. Biomed. Eng.* 68:11:3290–3300, 2021.
 23. J.A. Bergquist, W.W. Good, B. Zenger, J.D. Tate, L.C. Rupp, and R.S. MacLeod. The electrocardiographic forward problem: A benchmark study. *Comput Biol Med.* Jul;134, 2021.
 24. R. Kamali, J. Kump, E. Ghafoori, M. Lange, H. Nan, T.J. Bunch, D.J. Dossall, R.S. MacLeod, and R. Ranjan. Area Available for Atrial Fibrillation to Propagate is an Important Determinant of Recurrence after Ablation. *JACC Clin. EP* July:7(7):896–908, 2021.
 25. L.R. Bear, Y. Serinagaoglu Dogrusoz, W.G. Good, J. Svehlikova, J. Coll-Font, E. van Dam, and R.S. MacLeod. The Impact of Torso Signal Processing on Noninvasive Electrocardiographic Imaging Reconstructions. *IEEE Tran. Biomed. Eng.* 68(2): 436–447, 2021.
 26. J.A. Bergquist, J. Coll-Font, B. Zenger, L.C. Rupp, W.W. Good, D.H. Brooks, and R.S. MacLeod. Simultaneous Multi-Heartbeat ECGI Solution with a Time-Varying Forward Model: a Joint Inverse Formulation *Funct Imaging Model Heart* Jun:12738:493–502, 2021.
 27. K. Yamashita, R. Kamali, E. Kwan, R.S. MacLeod, D.J. Dossall, and R. Ranjan. Effective Ablation Settings That Predict Chronic Scar After Left Atrial Ablation. *JACC Clin Electrophysiol.* Feb;6(2):143-152, 2020
 28. W.G. Good, B. Erem, B. Zenger, J. Coll-Font, J.A. Bergquist, D.H. Brooks, and R.S. MacLeod. Characterizing the transient electrocardiographic signature of ischemic stress using Laplacian Eigenmaps for dimensionality reduction. *Comp. in Biol. & Med.*, 127:104059, 2020.
 29. R. Kamali, J. Schroeder, E. DiBella, B. Steinberg, F. Han, D.J. Dossall, R.S. Macleod, and R. Ranjan. Reproducibility of clinical late gadolinium enhancement magnetic resonance imaging in detecting left atrial scar after atrial fibrillation ablation. *J Cardiovasc Electrophysiol.* 31(11):2824–2832, Nov. 2020.
 30. J.D. Tate, T.A. Pilcher, K.K. Aras, B.M. Burton, and R.S. MacLeod. Validating Defibrillation Simulation in a Human-Shaped Phantom. *Heart Rhythm J* 17(4): 661-668, 2020.
 31. K. Yamashita, E. Kwan, R. Kamali, E. Ghafoori, B.A. Steinberg, R.S. MacLeod, D.J. Dossall, and R. Ranjan. Blanking period after radiofrequency ablation for atrial fibrillation guided by ablation lesion maturation based on serial MR imaging. *J Cardiovasc. Electrophysiol.* 31(2):450–456, 2020.

32. B. Zenger, W.G. Good, J.A. Bergquist, B.M. Burton, J.D. Tate, L. Berkenbile, V. Sharma, and R.S. MacLeod. Novel experimental model for studying the spatiotemporal electrical signature of acute myocardial ischemia: a translational platform. *Physiol Meas.* 41(1):0015002, 2020.
33. K. Yamashita, E. Ghafoori, J. Silvernagel, J. Ashton, D. Dossdall, R.S. MacLeod, and R. Ranjan. The Effective Contact Force to Minimize Edema Relative to Chronic Lesion Formation During Radiofrequency Ablation in Ventricular Wall. *Int Heart J.* 60(6):1407-1414, 2019.
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Oral Presentations

1. *The State of ECGI: A Big Space of Motivating Challenges* Consortium of ECG Imaging, Satellite Meeting, September, 2022.
2. *The Physiological Underpinnings of Acute Myocardial Ischemia* International Society of Computerized Electrocardiography, April, 2022.
3. *State of the Art in ECG Imaging* Invited presentation at the 2021 International Congress on Electrocardiology, Virtual, May, 2021.
4. *Is that really Electricity that Makes our Hearts Beat and our Brains Think?* Invited presentation in the BIOEN Current Research Series, University of Utah January, 2020.
5. *State of the Art in ECG Imaging – Trends and Future Directions* Invited presentation at the 2019 International Society of Electrocardiology Conference, Belgrade, Serbia, June 2019.
6. *Present and future of body surface mapping* Invited presentation at the 2019 International Society of Computerized Electrocardiology Conference, Atlantic Beach, FL, April, 2019.
7. *What Happens When You Overdraw on Your Metabolic Bank Account? Myocardial Ischemia and Heart Attacks.* Invited presentation at the Osher Lecture Series, University of Utah, February, 2019.
8. *ECG Imaging and Computational ECG* Invited presentation at the 2018 International Society of Electrocardiology Conference, Chiba City, Japan, June 2018.
9. *Computational ECG in Acute Ischemia* Invited presentation at the 2018 International Society of Electrocardiology Conference, Chiba City, Japan, June 2018.
10. *Cardiac Electrophysiology Simulations: Connecting Models, Images and Certainty to Clinical Care* Invited presentation at Philips Healthcare, Eindhoven, The Netherlands, June, 2018.
11. *Image Based Analysis and Modeling in Heart Disease* Invited presentation at the University of Bologna, Cesena, Italy, May, 2018.
12. *ECG Detection of Acute Ischemia: Time to Bury Old Dogma and Take a Fresh Look* Cardiology Grand Rounds, University of Maastricht, The Netherlands, May, 2018.
13. *How to Deal with A Broken Heart and Appreciate a Healthy One* Invited presentation at the Osher Lecture Series, University of Utah, February, 2018.
14. *How I Found a Dream Job—and You Can too* Invited presentation in the BIOEN Current Research Series, University of Utah January, 2018.
15. *Imaging and Mapping Research for AF* Invited presentation at Atrial Fibrillation Signals 2017, October 2017 in Valencia, Spain.

16. *Teaching Communications Skills to Undergraduate and Graduate Students of Biomedical Engineering at the University of Utah: A Genre Acquisition and Apprenticeship Approach* Invited presentation at the Biomedical Engineering Society Conference, October 2017 in Phoenix, AZ.
17. *Myocardial Ischemia and its ECG Signature: 100 years of Forgery?* Invited presentation at the STAFF 2017, September 2017 in St. Malo, France.
18. *Myocardial Ischemia and its ECG Signature: 100 years of Forgery?* Invited presentation at International Congress on Electrocardiology 2017, June 2017 in Portland, OR.
19. *Integrated Software Infrastructure for Image Based Modeling* Invited presentation at Workshop on Mathematical methods in cardiac electrophysiology, November 2017 in Ottawa, Canada.
20. *Early ECG Markers of Nontransmural Myocardial Ischemia* Invited presentation at International Congress on Electrocardiology (ICE) June 4-6, 2016 in Palma, Balearic Island, Spain.
21. *A Collaborative Approach to Solving Complex Problems in ECG Imaging* Invited presentation at the Universitat de Valencia, Valencia, Spain. June 1, 2016.
22. *Integrating engineers and clinicians in cardiovascular disease: challenges and opportunities* Invited presentation at FiCE 2016 workshop: “Electrocardiographic Imaging and Image Integration”, Maastricht, The Netherlands, 2016.
23. *Visions of Imaging and Mapping* Invited presentation at AF Signals, Karlsruhe, Germany, October 2015.
24. *Role of Imaging, Modeling, and Simulation in Management of Cardiac Arrhythmias.* Invited presentation at Dalhousie University Medical Reunion, Nova Scotia, Canada, August, 2015.
25. *The time is right: ECG Inverse solutions in research and clinical practice* Invited presentation and the International Society of Computerized Electrocardiology, San Jose, CA, April 2015.
26. *Validation and verification: new opportunities and old requirements* Plenary presentation at the First ECG-Imaging Workshop, Bad-Herrenalb, Germany, March, 2015.
27. *Propagation Modeling in Context: Applications and Infrastructure* Invited presentation at the Large Scale Modeling of Cardiac Electrophysiology A Critical Look at the past, present, and future of a discipline, Halifax, Nova Scotia, June 2014.
28. *Inverse Solutions in Electrocardiography: an Old Problem is Getting New Attention* Invited presentation at the International Society of Computerized Electrocardiology, in Jacksonville, FL, Apr, 2014.
29. *The Shape of Things to Come in AF Imaging* Invited presentation at the Western Atrial Fibrillation 2014 in Park City, UT, March, 2014.

30. *Image Based Modeling and Simulation in Cardiac Electrophysiology* Invited presentation at the Karl-Franzens University of, Graz, Austria, October, 2013.
31. *Image Based Modeling for Heart and Brain Bioelectricity* Invited presentation at the University of Muenster, Muenster, Germany, October, 2013.
32. *Image Based Analysis and Modeling in Cardiac Electrophysiology* Invited presentation at the University of Maastricht, Maastricht, The Netherlands, October, 2013.
33. *Open Source Software Solutions for Image Processing and Image Based Modeling in Cardiac Electrophysiology* Invited presentation at the Karlsruhe Institute of Technology in Karlsruhe, Germany, September, 2013.
34. *Open Source Software Solutions for Image Processing and Image Based Modeling in Cardiac Electrophysiology* Invited presentation at the Universitat Pompeu Fabra (UPF) in Barcelona, Spain, September, 2013.
35. *Image Based Modeling: Segmentation and Problem Solving Environments* Invited presentation at the INRIA Sophia Antipolis, France, September, 2013.
36. *The Role of Fibrosis and Morphology in Patient Based Simulation of Atrial Fibrillation.* Invited presentation at the International Congress on Electrocardiology in Glasgow, Scotland, August, 2013.
37. *Imaging and modelling of atrial morphology and fibrosis in atrial fibrillation patients.* Invited presentation at the Atrial Fibrillation: Clinical Challenges for Biophysical Modelling, in London, UK, June 2013.
38. *Patient-specific Models: Computational Pipeline for the Arrhythmia Simulation.* Invited presentation the Heart Rhythm Society Annual Scientific Sessions, May 2013.
39. *The Scientific Computing and Imaging Institute at the University of Utah: Overview, Image-based Modeling, Simulation and SCIRun.* Invited presentation at the 11th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, April, 2013.
40. *Image Analysis in AF: Not Just a Utah Story,* Invited presentation at the 2013 Western Atrial Fibrillation Symposium, 2013. Park City, Utah, March, 2013. (Co-chair of the symposium).
41. *Image Based Modeling of Atrial Arrhythmias Towards Personalized Clinical In-Silico Modeling of Atrial.* Invited presentation at the 2012 Cardiac Physiome Workshop, November, 2012.
42. *Software tools for Image Based Modeling, Simulation, and Visualization.* Director of Workshop at EMBC, October, 2012.
43. *Crossing the valley of death: Taking engineering to the Cardiac bedside.* Invited presentation at Kings College London September 12, 2012.
44. *Crossing the valley of death: Taking engineering to the Cardiac bedside.* Invited presentation at John Hopkins University ICM Distinguished Seminar Series, September 3, 2012.

45. *Subject Specific, Image Based Analysis and Modeling in Patients with Atrial Fibrillation from MRM*. Invited presentation at International Society of Biomedical Imaging (ISBI), 2012.
46. *Cardiac Delayed-Enhancement Magnetic Resonance Image Segmentation (cDEMIS)* Presenters: K. Rhode, R. Karim, R.S. MacLeod, J. Cates, and D. Peters. Image Processing Challenge, at International Society of Biomedical Imaging (ISBI), 2012.
47. *Image-based Management of Atrial Fibrillation* Invited plenary presentation at the NCRR/NIBIB P41 PI's Meeting, 2012. Bethesda, MD, March, 2012.
48. *Role of Image Processor in Managing AF*. Invited presentation at the 2012 Western Atrial Fibrillation Symposium, 2012. Park City, Utah, February, 2012. (Co-chair of the symposium).
49. *Medical Imaging in Personalized Health Care*. Invited plenary presentation at the Personalized Healthcare Penalized Healthcare 2012, University of Utah, 2012.
50. *Use of imaging in AFib and development of image based approaches for all aspects of patient management* Invited plenary presentation at International Congress on Electrocardiology, Kjnngston, Ontario, Canada, June, 2011.
51. *Inverse Problems in Electrocardiography* Invited expert presentation at MEDCAC Meeting 11/9/2011 - The Use of ECG Based Signal Analysis Technologies to Detect Myocardial Ischemia or Coronary Artery Disease. Baltimore, MD, November, 2011.
52. *MR imaging and atrial fibrillation* Invited presentation at NHLBI/VCU-World Congress on Mathematical Modeling and Computational Simulation of Cardiovascular and Cardiopulmonary Dynamics, June 2011.
53. *Imaging and Modeling in Atrial Fibrillation: An Engineer's Garden* Invited Minisymposium plenary at Functional Imaging and Modeling of the Heart, May, 2011.
54. *Image Based Modeling, Simulation, and Visualization in Biomedicine* Invited workshop at the NIH, NCRR Third Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE), June, 2010.
55. *Imaging and Image Processing in the Comprehensive Management of Patients with Atrial Fibrillation: the CARMA Approach* Invited keynote address at International Congress on Electrocardiology, Lund, Sweden, June, 2010.
56. *How to SCI in Utah with good CARMA: Image Based Science in Cardiac Electrophysiology* Invited seminar at Simula Research Laboratory, Oslo, Norway, June, 2010.
57. *Real-Time MRI imaging in the EP lab: from the Engineering point of view* Invited presentation at the Update on Atrial Fibrillation 2010, Coburg, Germany, April, 2010.
58. *Image Analysis for MRI Supported AF Management* Invited presentation at Western Atrial Fibrillation Symposium, Park City, Utah, February, 2010.

59. *Lest we forget—the Clinical Expectations and Requirements for Useful Simulation of Cardiac Bioelectricity* Invited presentation at the World Congress on Medical Physics and Biomedical Engineering, Munich, Germany, September 10, 2009.
60. *Lest we forget—the Clinical Expectations and Requirements for Useful Simulation of Cardiac Bioelectricity* Invited presentation at the Applied Inverse Problems Conference, Vienna, Austria, July 22, 2009.
61. *Simulation of Defibrillation: A Little Math Goes a Long Way* Invited presentation at the Institute of Mathematics and Scientific Computing, University of Graz, Austria, July 2, 2009.
62. *New Reasons for Doctors to Like Imaging: Applications in Cardiology and Neurology* Invited presentation at the Institute for Biomagnetism and Biosignalanalysis University of Muenster, Muenster, Germany, June 29, 2009.
63. *New Reasons for Doctors to Like Imaging: Applications in Cardiology and Neurology* Invited presentation at the Rochester Institute of Technology, May 6, 2009.
64. *Assessment of atrial fibrosis using MRI* Invited presentation at the 12th traditional international Prague workshop on catheter ablation, Prague, Czech Republic, April, 2009.
65. *MRI Supported Management of Atrial Fibrillation* Invited presentation at the Siemens/Utah Research Symposium, Salt Lake City, February, 2009.
66. *Real Time MRI and Animal Experiments* Invited presentation at the 2nd Western Atrial Fibrillation Symposium, Park City, UT, December, 2008.
67. *Atrial Fibrillation: A Heart Beating to a Different Drum* Invited presentation at the Salt Lake City Library, November, 2008.
68. *Image Processing/Analysis in Atrial Ablation* Invited presentation at the Park City Institute, Park City, UT, July, 2008.
69. *Real-Time MRI imaging in the EP lab: from the Engineering point of view* Invited presentation at the Update on Atrial Fibrillation, Coburg, Germany, 2008.
70. *Novel use of MRI in Atrial Fibrillation: a Gold Standard?* Invited presentation at the International Society of Computerized Electrocardiology Conference, Riverside, CA, May, 2008.
71. *An Interdisciplinary Approach to Scientific Computing, Imaging, and Visualization* Invited presentation at NIH-LBI (VCU) short course on Computational Modeling Applications in Cardiopulmonary Dynamics, March, 2008.
72. *Two Short Stories of Bioelectric Fields and the Heart* R.S. Macleod. Division of Cardiology Grand Rounds, University of Utah, February, 2008.
73. *Simulation of Defibrillation: A Little Math Goes a Long Way* R.S. MacLeod. Applied Math seminar, Department of Mathematics, University of Utah, January, 2008.

74. *Image Processing/Analysis to Facilitate Atrial Ablation* R.S. MacLeod. Invited presentation at the Western Atrial Fibrillation Symposium, Park City, UT, December, 2007.
75. *Image Processing in Treating Atrial Fibrillation: One Challenging Problem After Another* R.S. MacLeod. Imaging seminar, Scientific Computing and Imaging Institute, University of Utah, December, 2007.
76. *Patient Specific Modeling of ICD Placement in Children* R.S. MacLeod. Division of Cardiology Research Rounds, Department of Pediatrics, University of Utah, September, 2007.
77. *Multimodal Imaging for Diagnosis and Treatment of Atrial Fibrillation* R.S. MacLeod. Plenary Talk at the Utah Center for Advanced Imaging Research Research Conferences. September, 2007
78. *Monitoring the Inside from the Outside* R.S. MacLeod. Invited presentation at Computers in Cardiology Conference, Sunday Symposium, September, 2007.
79. *Applications of Biomedical Computing in the Heart* R.S. MacLeod. NBCR Summer Institute Mini-Symposium, UCSD, San Diego. July, 2007.
80. *The Electrocardiology of Myocardial Ischemia* R.S. MacLeod. CVRTI Research in Progress Lecture Series, November, 2006.
81. *An Interdisciplinary Approach to Scientific Computing, Imaging, and Visualization* R.S. MacLeod. Dalhousie University College of Engineering Invited Lecture Series, September, 2006.
82. *Mechanism for ST depression associated with contiguous subendocardial ischemia* R.S. MacLeod, S. Shome, B.B. Punske, B. Hopenfeld, J.G. Stinstra, and B. Taccardi. International Congress of Electrocardiology 2006. Koeln, Germany (Invited presentation).
83. *Quantitative Electrocardiography: two Steps Forward and One Step Back.* R.S. MacLeod and D.H. Brooks. Noninvasive Functional Source Imaging, 2005. (Invited plenary presentation).
84. *Ischemia-induced ST changes and arrhythmic risk.* International Congress of Electrocardiology 2005. Gdansk, Poland. (Invited presentation).
85. *Epicardial Potentials Arising From Subendocardial Ischemia* First virtual visualization of the reconstructed electrocardiographic display symposium. Halle, Belgium, 2004.
86. *Bioelectric Field Computation: How Simple Problems Become Hard* at the Eleventh Biennial IEEE Conference on Electromagnetic Field Computation (CEFC 2004), Seoul, Korea, 2004.
87. *Mixing Computers, Engineering, Doctors, and Biologists: How to take the "I" out of Interdisciplinary* Plenary address at Computing in Medicine and Biology at Marquette University, March, 2004.

88. *Experimental Approaches in Myocardial Ischemia Imaging* at the Electrophysiology of Acute Ischemia and Infarction Workshop held in conjunction with the International Congress on Electrocardiology. Helsinki, Finland, June 2003.
89. *Imposing Multiple Constraints in Electrocardiographic Inverse Problems* at Applied Inverse Problems: Theoretical and Computational Aspects, Lake Arrowhead, May, 2003.
90. *Inverse Bioelectric Field Problems: Modeling, Simulation, and Visualization*, Chris Johnson, Co-author, at Applied Inverse Problems: Theoretical and Computational Aspects, Lake Arrowhead, May, 2003.
91. *Multimodal Imaging of Cardiac Activation, Perfusion, and Ischemia* at the Medical Imaging Research Lab Research Conference, Sundance, Utah, 2002.
92. *Physiologic and Biochemical Basis of Myocardial Protection from Acute Ischemia and Infarction* at the Electrophysiology of Acute Ischemia and Infarction Workshop held in conjunction with the International Congress on Electrocardiology. Montreal, 2002.
93. *Estimation, Interpolation, and Modeling in Cardiac Mapping* Karfranzens Universität Graz, Austria, September, 2001.
94. *Ischemia in the Electrolytic Torso Tank* Department of Physiology, University of Parma, September, 2001.
95. *The Physiome Project* Scientific Computing and Imaging Institute, University of Utah, February, 2000.
96. *Electrocardiographic Imaging: Look Ma', No Rays* Medical Imaging Research Laboratory, University of Utah, September, 1999.
97. *Computing Torso Current Fields using Finite Element and Boundary Element Methods* Scientific Computing and Imaging Institute, University of Utah, June, 1999.
98. *Statistical Signal Processing in Electrocardiology* Scientific Computing and Imaging Institute, University of Utah, December, 1998.
99. *The Problem Solvers's Toolbox for Bioelectricity and Biomagnetism*, Bioengineering Department, University of Utah, October, 1998.
100. *Inverse Problems in Cardiology* Department of Bioengineering, University of Utah, March, 1997.
101. *Evaluation of Measurement Methods for Detecting Heterogeneous Repolarization* Division of Cardiology, Department of Internal Medicine, University of Utah, Salt Lake City, Utah. May, 1996.
102. *Remote Sensing of Electrocardiographic Fields: Experimental and Modeling Approaches* Department of Electrical and Computer Engineering, Northeastern University, September, 1995.

103. *The Heart as a Source of Electricity: "Current Thoughts"* Division of Cardiology, Department of Internal Medicine, University of Utah, Salt Lake City, Utah. February, 1994.
104. *Applications of Inverse Solutions in Cardiology: Adventures in Mapping, Modeling, and Cardiology.* Department of Bioengineering, University of Utah. February, 1993.
105. *Interpolation, a Mapper's Best Friend?* Division of Cardiology, Department of Internal Medicine, University of Utah, Salt Lake City, Utah. January, 1993.
106. *The Forward and Inverse Problems of Electrocardiology: Electrostatics, Laplace Equation, Green's Theorem and some Nasty Numerics.* Department of Physics, Dalhousie University, Halifax, Nova Scotia, Canada. October, 1992.
107. *Interactive Visualization of Cardiac Bioelectricity.* Utah Supercomputing Institute Visualization Workshop, Salt Lake City, Utah. May, 1992.
108. *Noninvasive Detection of Acute Myocardial Ischemia During Coronary Angioplasty.* Division of Cardiology, Department of Internal Medicine, University of Utah, Salt Lake City, Utah. January, 1992.
109. *Von der Brust zur Herzoberfläche: eine Lösung des Rückwärtsproblems in der Elektrokardiographie.* Institut für Biomedizinische Technik, Technische Universität Graz, Graz, Austria, June 1990.
110. *Koronardilatation als Modell für Ischämie im Menschen.* Institut für Medizinische Physik und Biophysik, Universität Graz, Graz, Austria, June 1990.
111. *Computers in the medical workplace.* 3rd Annual AGM and Seminar of the Canadian Association of Cardio-Pulmonary Technologists, Halifax, Nova Scotia, 1988.
112. With H. Windisch, and W. Müller. *A refined system to detect cardiac spread of excitation by optical means.* Workshop on the Technical Aspects of Cardiac Mapping, Halifax, Nova Scotia, June 1987.
113. *Body Surface Potential Mapping in der Elektrokardiographie.* Institut für Medizinische Physik und Biophysik, Graz, Austria, 1987.

Diplomarbeit (Master's Thesis)

R.S. MacLeod. *Signal Verzögerung in der Tontechnik – Entwicklung eines digitalen Verzögerungsgerätes mit Deltamodulatoren.* Masters thesis, Technical University of Graz, Graz, Austria, 1985.

Ph.D. Thesis

R.S. MacLeod. *Percutaneous Transluminal Coronary Angioplasty as a Model of Cardiac Ischemia: Clinical and Modelling Studies.* Dalhousie University, Halifax, N.S. Canada, 1990.