

Meng-Jen (Vince) Wang, PhD
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Summary: Received nuclear engineering and reactor physics training from Virginia Tech nuclear engineering program with specialty in particle transport methods, including applications and development. Experienced in high performance computing and particle transport applications including radiation shielding, reactor physics, and reactor depletion calculations. Familiar with Monte Carlo, deterministic, and hybrid methods for particle transport calculations. Currently working as a research scientist at University of Utah; focusing on TRIGA reactor analysis and operations, including core calculations, radiation shielding, and preliminary design of a neutron radiography facility, as well as participating the Utah TRIGA reactor biannual fuel inspection and regular reactor operation.

Education

- Ph.D., Nuclear Engineering, Virginia Tech, Falls Church, Virginia, U.S.A., 2019
- M.S., Nuclear Engineering, National Tsing Hua University (NTHU), Hsinchu City, Taiwan, 2011
- B.S., Physics, Fu-Jen Catholic University (FJCU), Xinzhuang, New Taipei City, Taiwan, 2009

Experiences

- **Research Scientist, Nuclear Engineering Program, Civil and Environmental Engineering Department, University of Utah, Salt Lake City, October 2020 to present.** Writing proposal to support existing research activities. Support UUTR research/administrative/safety related activities. Teaching graduate level Health Physics class for UNEP. Guiding and helping graduate students' research.
- **Postdoctoral Researcher, Nuclear Engineering Program, Civil and Environmental Engineering Department, University of Utah, Salt Lake City, October 2019 to October 2020.** Performing TRIGA reactor analysis and a neutron radiography facility preliminary design and study using both Monte Carlo and deterministic codes. Characterization of the Utah HPGe detector efficiency by both computation and experiment. Dose rate evaluations for the AmBe and PuBe neutron source at the UNEP facility both experimentally and computationally. Participating Utah TRIGA reactor operation and experiments. Participating the biannual Utah TRIGA reactor fuel inspection. Teaching the graduate level Health Physics class for UNEP. Guiding and helping graduate students' research.
- **Graduate Teaching/Research Assistant, Nuclear Engineering Program/Mechanical Engineering Department, Virginia Tech, Falls Church/Arlington, Virginia, August 2014 to Sep 2019 (Without all the summers and 2017 Falls).** 1. Perform research on the RAPID (Real-time Analysis for Particle transport and In-situ Detection) code system, both development and applications, specifically on developing the DRF (Detector Response Function) methodology for shielding problems. 2. TA various multi-disciplined courses, including particle transport, Monte Carlo method, reactor physics, fluid dynamics, heat and mass convection, and alternative energy systems (using the SAMS renewable energy analysis software).
- **Graduate Teaching Assistant, Continuous and Professional Education, Virginia Tech, Arlington, Virginia, August 2017 to December 2017.** Assist faculty in mechanical and electrical engineering departments on developing the online courses for working professional, focusing on subjects of energy systems and smart city.
- **Graduate/Full-Time Research Assistant, Institute of Nuclear Science and Engineering, National Tsing-Hua University (THOR TRIGA Reactor, Hsinchu City, Taiwan), July 2009 to January 2013.** Perform reactor core analysis and collaborate with the Tsing-Hua Open Pool (THOR) 2 MW TRIGA

research reactor facility, as a master degree student (July 2009 to July 2011) and full-time research assistant (August 2011 to January 2013).

Internship Award

- **Summer Intern Fellow, Center for Space Nuclear Research (CSNR), June 2015 to August 2015, Idaho National Laboratory, Idaho Falls, Idaho.** Perform neutronics analysis on the Ultra-High I_{sp} Nuclear Thermal Rocket (NTR) core design. Collaborated with other intern fellows with specialties in material science and aerospace.
- **Summer Intern Fellow, Post Irradiation and Examination (PIE), Material Fuel Complex, Idaho National Laboratory, June 2016 to August 2016, Idaho Falls, Idaho.** Perform neutronics analysis on the north beam port of the NRAD reactor and participated hands on foil irradiation. The work was performed to support the neutron radiography. Both core criticality and beam port fixed source analysis are performed.
- **Summer Intern Fellow, Center for Space Nuclear Research (CSNR), June 2017 to August 2017, Idaho National Laboratory, Idaho Falls, Idaho.** Perform the Multi-Mission Radioisotope Thermal Generator (MMRTG) assembling and testing line analysis using the SIMEVENTS in the MATLAB. Participated the ^{238}Pu production computational analysis using the ATR reactor SERPENT model.
- **Summer Intern Fellow, Used Fuel System Group, Oak Ridge National Laboratory, May 2018 to August 2018, Oak Ridge, Tennessee.** Perform spent nuclear fuel cask criticality analysis using the RAPID and UNF-ST&DARD library. The analysis includes depletion and criticality calculations.

Publications (Selected)

- **M.-J. Wang**, G.E. Sjoden, A. Foley, S. Mohanty, "Hyper-Accurate Three-Dimensional Utah TRIGA Reactor Core Flux Calculations using PENTRAN and MCNP6", *Annals of Nuclear Energy*. (2020) – Submitted
- **M.-J. Wang**, G.E. Sjoden, "Experimental and Computational Dose Rate Evaluation for the University of Utah ^{241}Am -Beryllium Neutron Source", *Nuclear Technology*. (2020) – Preparing for Submission
- **M.-J. Wang**, A. Haghghat, K. Banerjee, "Benchmark of RAPID Code System Using UNF-ST&DARD Library for Spent Nuclear Fuel Cask Criticality Safety Analysis with Axial Burnup Profile", *Annals of Nuclear Energy*. (2020) – Preparing for Submission
- **M.-J. Wang**, R.-J. Sheu, J.-J. Peir, J.-H. Liang, "Criticality calculations of the HTR-10 pebble-bed reactor with SCALE6/CSAS6 and MCNP5," Technical Note, *Annals of Nuclear Energy*, Volume 64, Pages 1-7 (2014).
- **M.-J. Wang**, J.-J. Peir, R.-J. Sheu, J.-H. Liang, "Effects of Geometry Homogenization on the HTR-10 Criticality Calculations," *Nuclear Engineering and Design*. (Transaction from HTR-2012)
- **M.-J. Wang**, J.-J. Peir, D.-S. Chao, J.-H. Liang, "Effects of Homogeneous Geometry Models in Simulating the Fuel Balls in HTR-10," *Journal of Power and Energy Systems*, Volume 6, Issue 3, (2012). (Transaction from ICONE-19)
- **M.-J. Wang**, J.-J. Peir, C.-W. Chi, J.-H. Liang, "A Parametric Study of Fuel Lattice Design for HTR-10," Technical Note, *Journal of Engineering for Gas Turbines and Power-Transactions of the ASME*, Volume 133, Issue 8, (2011). (Transaction from ICONE-18)
- M. Hartos, **M.-J. Wang**, G. E. Sjoden, "3-D Monte Carlo vs S_N Deterministic Radiation Transport Methods Supporting an Optimized Neutron Imaging Source at the Utah TRIGA Reactor", International Conference on Mathematics & Computational Methods Applied to Nuclear Science & Engineering, Rayleigh, North Carolina, U.S.A. (2020). - Submitted
- K. Powell, M. Lund, **M.-J. Wang**, Y. Qian, D. Maggini, M. Reese, E. Cazalas, G. Sjoden, H. Yoon, "Photovoltaic Response of CdS/CdTe Thin-film Solar Cells under Controlled Neutron Radiation in a TRIGA Reactor", 62nd Electronic Materials Conference, Columbus, Ohio, U.S.A. (2020)
- **M.-J. Wang**, G. E. Sjoden, "Response and Interference Assessment of an HPGe Detector using SN and

Monte Carlo Transport”, ICRS 14/RPSD-2020, 14th International Conference on Radiation Shielding and, 21st Topical Meeting of the Radiation Protection and Shielding Division, Seattle, Washington, U.S.A. (2020)

- **M.-J. Wang**, G. E. Sjoden, “UUTR Unit Cell Calculations with PENTRAN (S_N) and MCNP6 for Activation Foil Validation Studies”, 2020 ANS Annual Meeting, Phoenix, Arizona, U.S.A. (2020)
- **M.-J. Wang**, A. Haghghat, “Experimental Benchmark for the DRF Methodology using the VENUS-3 Problem”, 2019 ANS Winter Meeting and Nuclear Technology Expo, Washington DC, U.S.A. (2019)
- **M.-J. Wang**, A. Haghghat, “DRF Methodology for Reactor Pressure Vessel Dosimetry and its Uncertainties”, International Conference on Mathematics & Computational Methods Applied to Nuclear Science & Engineering, Portland, Oregon, U.S.A. (2019).
- V. Mascolino, A. Haghghat, N. Polys, **M.-J. Wang**, and S. Rajamoham, “A Collaborative Virtual Reality System (VRS) with X3D Visualization for RAPID”, International Conference on Mathematics & Computational Methods Applied to Nuclear Science & Engineering, Portland, Oregon, U.S.A. (2019).
- **M.-J. Wang**, A. Haghghat, “A Novel Detector Response Formulation for RAPID”, PHYSOR 2018: Reactors Physics paving the way towards more efficient systems Cancun, Mexico (2018).
- K. Benensky, **M.-J. Wang**, J. Nieminen, M. Eades, S. Howe, “Preliminary Analysis of Low Enriched Uranium (LEU) Ultra High Temperature Nuclear Thermal Rockets Capable of 1100s Specific Impulse,” Nuclear and Emerging Technologies for Space (NETS), Huntsville, Alabama, U.S.A. (2016).

Services

- University of Utah TRIGA Reactor Safety Committee non-voting Attendee (2020 - present)

Teaching

- Graduate Level Health Physics – Nuclear Engineering Program, University of Utah, 2020 Falls.

Award and Scholarship

- Ranked 2nd in the 2009 admission list of Institute of Nuclear Engineering and Science, NTHU with scholarship (2009).
- Awarded with Dr. Bao-Shan Weng memorial scholarship (2011).
- Announced as winner of student oral competition in the ICONE19 (2011).