William Gurecky

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Education

- **The University of Texas at Austin** — Austin, TX
  M.S. Mechanical Engineering. GPA: 3.96 — *December 2015*
  - Nuclear and Radiation Engineering Program
  - Thesis: Development of an MCNP6-ANSYS FLUENT Multiphysics Coupling Capability
- **The University of Texas at Austin** — Austin, TX
  B.S. Mechanical Engineering. GPA: 3.69 — *May 2013*

Experience

- **The University of Texas at Austin** — Austin, TX
  Graduate Research Assistant — *August 2013 - Present*
  - Leveraged gradient boosting, a supervised machine learning technique, and copula to construct a CFD informed reduced order model of Chalk River unidentified deposit (CRUD) growth.
  - Compared KENO-VI, MPACT and MCNP6 pin power distribution and eigenvalue results in support of the Consortium for the Advanced Simulation of Light Water Reactors (CASL) benchmarking and validation goals.
  - Authored C/C++ STAR-CCM+ user code to extract CFD field data to the HDF5 format.
  - Aided in the development of a coupled CRUD/CFD simulation package.
- **Oak Ridge National Laboratory** — Oak Ridge, TN
  NESLS Internship — *Summer 2015*
  - Developed an MCNP-ANSYS Fluent coupling that utilized MCNP6's unstructured mesh capability.
  - Developed post processing tools to reconstruct full core pin power distribution maps in the HDF5 format from MCNPX results to facilitate code-to-code comparison work.
- **The University of Texas at Austin** — Austin, TX
  Undergraduate Research Assistant — *August 2011 - May 2013*
  - Conducted analysis of a two-phase impinging jet using ANSYS Fluent to investigate the damaging potential of a cold-leg pipe rupture in a nuclear power system.
  - Investigated equations of state, solver options, turbulence models, and convergence issues.
  - Authored post processing tools that distill CFD field data into a compact mathematical model.
- **Los Alamos National Laboratory** — Los Alamos, NM
  Guest Undergraduate Researcher — *Summer 2012*
  - Repaired and improved existing MATLAB and FORTRAN routines used to predict the behavior of a loss of coolant accident (LOCA) jet which resulted in streamlined data review and model comparison operations.
  - Developed and deployed automation routines to conduct CFD parameter sweeps and sensitivity analyses.
- **Neo Industries** — Colleyville, TX
  Machine Operator — *Summer 2011*
  - Operated and programmed Mazak and Okuma lathes fabricating precision parts for a variety of applications.

- Interpreted engineering print dimensions and tolerances to make tooling and setup decisions.
- Optimized production processes by tuning CNC programs to reduce tool wear, time spent per part, and scrap.
- Modified tooling and fixtures needed for the fabrication of specialty parts.

Publications

R. Salko, **W. Gurecky,** S. Slattery, K. Clarno, D. Pointer, D. Walker, V. Petrov, and A. Manera. *Implementation of a Grid Heat Transfer and Turbulent Kinetic Energy Hi2Lo Remapping Capability into CTF in Support of the CIPS Challenge Problem.* Tech. rep. CASL-U-2017-1322-000. Apr. 2017

S. Slattery and **W. Gurecky**. *Support for CILC L1 Milestone Using STAR-CCM+*. Tech. rep. CASL-U-2016-1237-000. Oct. 2016

W. Gurecky. "Development of an MCNP-ANSYS Fluent Multiphysics Coupling Capability". Thesis. University of Texas at Austin, Dec. 2015

W. Gurecky, E. Schneider, and D. Ballew. "Reduced Order Modeling of Flashing Two-phase Jets". In: *Nuclear Engineering and Design* 294 (2015), pp. 60–72

W. Gurecky and E. Schneider. *MCNPX Simulations of WBNP Unit 1 with Keno Comparisons.* Tech. rep. CASL-U-2015-0221-000. Feb. 2015

Conference Proceedings

W. Gurecky and E. Schneider. "Development of an MCNP6-ANSYS Fluent Multiphysics Coupling Capability". In: *Proceedings from the International Conference on Nuclear Engineering (ICONE).* Charlotte, NC, USA, July 2016

W. Gurecky and E. Schneider. "Watts Bar Unit 1 MCNPX Simulations with KENO-VI Comparisons". In: *Proceedings from the Am. Nuc. Soc. Winter Meeting 2014.* Anaheim, CA, USA, Nov. 2014

Awards

C.W. Besserer Memorial Endowed Presidential Scholarship, 2012-2013
Texas Society of Professional Engineers Scholarship, 2009
TAME Halliburton Scholarship, 2009
AP Distinguished Scholar, 2009
TAME Statewide Math and Science Competition 2nd place in physics and calculus, 2009

Skills

Languages: Python (NumPy, SciPy, scikit-learn, pandas, PyTables, h5py, mpi4py), C/C++, MATLAB, Bash, VBA, LaTeX

Operating Systems: Linux, MacOS X, Windows

Applications: MCNP6, STAR-CCM+, ANSYS Fluent, VERA, Origen 2.2, SolidWorks, Microsoft Word, Excel, pfSense, Ansible, Vim

Additional Skills: Primary maintainer of a 7-node, 214 core Beowulf style Debian Linux cluster

Open Source Projects

GammaSpy: A gamma ray spectroscopy peak visualization, finding, and fitting application.
https://github.com/wgurecky/GammaSpy

pyReactor: A point kinetic reactor model with GUI front end that interfaces with an Arduino driven LEGO® Model. This package was developed to inform K-12 students about nuclear engineering.
https://github.com/wgurecky/pyReactor

StarVine: Provides tools to construct canonical and regular-vines (C-vines, and R-vines). StarVine can also be used as a standalone copula fitting tool for bivariate dependence modeling.
https://github.com/wgurecky/StarVine

vimSum: Allows one to perform basic arithmetic on columns of numbers inside the Vim text editor in visual mode.
https://github.com/wgurecky/vimSum