

## Matthew J. Gidden, Ph.D.

---

CONTACT INFORMATION	International Institute for Applied Systems Analysis Schlossplatz 1, A-2361 Laxenburg Austria	Mobile: +43 (0)6 676 175 3442 E-mail: <a href="mailto:mattthew.gidden@gmail.com">mattthew.gidden@gmail.com</a> Website: <a href="http://mattgidden.com">mattgidden.com</a> Github: <a href="https://github.com/gidden">gidden</a>
CITIZENSHIP	USA	
RESEARCH INTERESTS	Energy systems, energy policy, scientific computation, nuclear fuel cycle analysis, agent-based modeling, advanced nuclear reactors, nuclear nonproliferation	
EDUCATION	<p>PH.D., <i>Nuclear Engineering</i>, <b>University of Wisconsin - Madison</b> <b>March 2015</b></p> <ul style="list-style-type: none"><li>• An Agent-Based Modeling Framework and Application for the Generic Nuclear Fuel Cycle</li><li>• Advisor: Professor Paul P.H. Wilson</li></ul> <p>MASTERS, <i>Nuclear Engineering</i>, <b>University of Wisconsin - Madison</b> <b>December 2011</b></p> <p>B.S., <i>Nuclear Engineering</i>, <b>Texas A&amp;M University</b> <b>May 2009</b></p> <ul style="list-style-type: none"><li>• <i>Summa cum Laude</i>, With Honors in Engineering</li><li>• Minor in Mathematics</li></ul>	
RESEARCH EXPERIENCE	<p><b>International Institute for Applied Systems Analysis, Energy Group, Laxenburg, AUSTRIA</b> <b>Oct 2015 – Present</b> <i>Research Scholar</i> Performed large-scale integrated assessment modeling exercises and specialized in GIS-based spatial modeling and analysis.</p> <p><b>University of Wisconsin, NE Dept., Madison, WI</b> <b>Apr – Oct 2015</b> <i>Postdoctoral Researcher</i> Investigated novel methods for modeling recycle fuel fabrication in NFC simulations.</p> <p><b>University of Wisconsin, NE Dept., Madison, WI</b> <b>Aug 2010 – Mar 2015</b> <i>Graduate Research Assistant</i> <b>Aug 2009 – Jan 2010</b> Developed and extended the Cyclus NFC simulator to model generic nuclear fuel cycles.</p> <p><b>AREVA, Paris, FRANCE</b> <b>Feb – Jul 2010</b> <i>Research Intern (Stagiaire), Core Design Group</i> Simulated and analyzed a boron dilution accident in multiple reactor configurations using MCNP.</p> <p><b>Pacific Northwest National Lab, Richland, WA</b> <b>Jun – Aug 2009</b> <i>Research Assistant</i> Analyzed a design of an automated verification unit for canisters of enriched UF<sub>6</sub> using MCNP.</p> <p><b>TN International (AREVA), Montigny-le-Bretonneux, FRANCE</b> <b>Jun – Aug 2008</b> <i>Research Intern, Materials Group</i> Analyzed material suitability for nuclear cask shock absorber via dynamic compression testing.</p> <p><b>Oak Ridge National Lab, Oak Ridge, TN</b> <b>Jun – Aug 2007</b> <i>Research Assistant</i> <b>Jun – Aug 2006</b> Tested the collimation of radiation portal monitors for use with the U.S. Megaports Initiative.</p>	
HONORS & AWARDS	2 <sup>nd</sup> Place in Energy Policy, Innovations in Fuel Cycle Research Winner, The Why Files Cool Science Image Contest	<b>2014</b> <b>2014</b>

	Nuclear Energy University Program Graduate Research Fellowship	2010 – 2013
	American Nuclear Society Graduate Scholarship	2013
	Nuclear Regulatory Commission Undergraduate Scholarship	2008 – 2009
	President's Endowed Scholarship, Texas A&M University	2005 – 2009
	Stinson Scholarship, Texas A&M University	2005 – 2009
PROFESSIONAL	<b>European Geosciences Union</b> , Member	2016 – Present
ORGANIZATIONS &	<b>Institute for Operations Research and Management Science</b> , Member	2014 – Present
SERVICE	<b>American Nuclear Society</b> , Member	2006 – Present
	Communications Committee, Member	2013 – Present
	Public Policy Committee, Member	2013 – Present
	Special Advisory Committee on Nuclear Nonproliferation, Member	2012 – 2016
	Student Sections Committee, Member	2010 – 2016
	Local Sections Committee, Member	2010 – 2012
	Nuclear Nonproliferation Special Committee, Member	2010 – 2012
	ANS Student Conference, Co-Chair	2008
	<b>Institute of Nuclear Materials Management</b> , Member	2008 – Present
	<b>Alpha Nu Sigma</b> , Member	2009 – Present
	<b>Nuclear Engineering Student Delegation</b> , Delegate	2011 – 2013
	Chair	2013
	Vice Chair	2012
	<b>American Nuclear Society, Texas A&amp;M Chapter</b> , Member	2005 – 2009
	Vice President	2006 – 2007
TEACHING	<b>European Geoscience Union General Assembly 2017</b> , Vienna, Austria	April 27 – 2017
EXPERIENCE	Working with big, multi-dimensional geoscientific datasets in Python: a tutorial introduction to xarray	
	<b>Open Energy Modeling Workshop</b> , Frankfurt, Germany	April 19 – 2017
	Introduction to Scientific Programming in Python	
	<b>African Institute for Mathematical Sciences (AIMS)</b>	Aug 31 – Sept 11, 2015
	<b>Structured Master's in Mathematical Sciences</b> , Cape Town, South Africa	
	Scientific Computation with Python	
	<b>University of Wisconsin Advanced Computing Initiative</b> , Madison, WI	Aug 26 – 27, 2015
	Software Carpentry: Version Control with Git	
	<b>University of Wisconsin Advanced Computing Initiative</b> , Madison, WI	Jan 13 – 16, 2015
	Software Carpentry: Version Control	
	<b>University of Wisconsin Advanced Computing Initiative</b> , Madison, WI	Aug 25 – 26, 2014
	Software Carpentry: Version Control and Unit Testing	
	<b>University of Wisconsin Advanced Computing Initiative</b> , Madison, WI	Aug 28 – 29, 2013
	Software Carpentry: Version Control	
	<b>University of Wisconsin Advanced Computing Initiative</b> , Madison, WI	Apr 29 – 30, 2013
	Software Carpentry: Version Control and Unit Testing	
COMPUTATIONAL SKILLS	I have deep and broad software development skills and experience. I help maintain and manage a number of open source scientific software packages including <a href="#">Cyclus</a> and <a href="#">PyNE</a> .	

## EXPERT (5+ YEARS EXPERIENCE)

Languages	C++/C, Python
Build Systems	CMake, Make, Autoconf/Automake
Version Control	Git
Tools	L <sup>A</sup> T <sub>E</sub> X, Doxygen, Sphinx, XML
Database Formats	SQL, HDF5
Test Frameworks	GoogleTest, Nose
NE Applications	MCNP, Origen

## FAMILIAR

Languages	FORTRAN, Java, Visual Basic, Perl
Version Control	Mercurial, Subversion
Tools	Jekyll, JSON
NE Applications	DRAGON, TransLAT
Other Applications	IPython/IPython Notebooks, Matlab, Mathcad, Mathematica, Maple

## JOURNAL PUBLICATIONS

- [1] **Gidden, M. J.** Wilson, P. P., “A methodology for determining the dynamic exchange of resources in nuclear fuel cycle simulation,” *Nuclear Engineering and Design*, pp. –, 2016, ISSN: 0029-5493. DOI: <http://dx.doi.org/10.1016/j.nucengdes.2016.10.029>. [Online]. Available: <http://www.sciencedirect.com/science/article/pii/S0029549316304101>
- [2] Huff, K. D. **Gidden, M. J.** Carlsen, R. W. Flanagan, R. R. McGarry, M. B. Opotowsky, A. C. Schneider, E. A. Scopatz, A. M. Wilson, P. P., “Fundamental concepts in the cyclus nuclear fuel cycle simulation framework,” *Advances in Engineering Software*, vol. 94, pp. 46 –59, 2016, ISSN: 0965-9978. DOI: <http://dx.doi.org/10.1016/j.advengsoft.2016.01.014>. [Online]. Available: <http://www.sciencedirect.com/science/article/pii/S0965997816300229>
- [3] Pearce, T. M. Williams, J. J. Kruzel, S. P. **Gidden, M. J.** Williams, J. C., “Dynamic control of extracellular environment in in vitro neural recording systems,” *Neural Systems and Rehabilitation Engineering, IEEE Transactions on*, vol. 13, no. 2, pp. 207–212, 2005

## REFEREED PROCEEDINGS

- [4] **Gidden, M.** Wilson, P., “Dynamic resource exchange with coinor-cbc in cyclus, a nuclear fuel cycle simulator,” in *Operations Research and Computing: Algorithms and Software for Analytics*, Richland, VA, United States, Jan. 2015
- [5] **Gidden, M.** Carlsen, R. Opotowsky, A. Rakhimov, O. Scopatz, A. Wilson, P., “Agent-based dynamic resource exchange in cyclus,” in *Proceedings of PHYSOR*, Kyoto, Japan, Sep. 2014
- [6] **Gidden, M.** Wilson, P., “An agent-based framework for fuel cycle simulation with recycling,” in *Proceedings of GLOBAL*, Salt Lake City, UT, United States, Sep. 2013

## CONFERENCE PUBLICATIONS

- [7] **Gidden, M. J.** Byers, E. Greve, P. Kahil, T. Parkinson, S. Raptis, C. Rogelj, J. Satoh, Y. Vliet, M. Wada, Y. Krey, V. Langan, S. Riahi, K., “Hydroclimatic risks and uncertainty in the global power sector,” in *European Geosciences Union General Assembly*, Vienna, Austria, Apr. 2017
- [8] **Gidden, M. J.** Huppmann, D. Krey, V. Fricko, O. Kolp, P. Riahi, K., “The new MESSAGE<sub>ix</sub> Modeling Platform,” in *Open Energy Modelling Workshop*, Frankfurt, Germany, Apr. 2017

- [9] **Gidden, M. J.** Parkinson, S. C. Rao, N. D. Riahi, K., “Spatial Downscaling of Urban and Rural Income and Inequality for the Shared Socioeconomic Pathways,” in *Ninth Annual Meeting of the IAMC 2016*, Beijing, China, Dec. 2016
- [10] **Gidden, M.** Wilson, P., “Dynamic resource exchange performance in cyclus,” in *Transactions of the American Nuclear Society*, San Antonio, TX, United States, Jun. 2015
- [11] **Gidden, M.**, *Exploring nuclear fuel cycle simulation using htcondor*, HTCondor Week, May 2015
- [12] Carlsen, R. W. **Gidden, M. J.** Wilson, P. P., “Deployment Optimization with the CYCLUS Fuel Cycle Simulator,” in *Transactions of the American Nuclear Society*, DOI link for code, methods, etc: <http://dx.doi.org/10.6084/m9.figshare.1086284>, vol. 111, Anaheim, CA, Nov. 2014, pp. 241–244
- [13] Biondo, E. Scopatz, A. **Gidden, M.** Slaybaugh, R. Bates, C. Willson, P. P., “Quality Assurance within the PyNE Open Source Toolkit,” in *Transactions of the American Nuclear Society*, vol. 111, Anaheim, CA, Nov. 2014. [Online]. Available: <https://github.com/pyne/ans-winter-2014-vnv>
- [14] **Gidden, M.** Wilson, P. Scopatz, A., “Developing standardized, open benchmarks and a corresponding specification language for the simulation of dynamic fuel cycles,” in *Proceedings of the 2013 ANS Summer Conference*, Atlanta, GA, United States, Jun. 2013
- [15] **Gidden, M.** Wilson, P. Huff, K. Carlsen, R., “Once-through benchmarks with cyclus, a modular, open-source fuel cycle simulator,” in *Proceedings of the 2012 ANS Winter Conference*, San Diego, CA, Nov. 2012
- [16] **Gidden, M.** Wilson, P. Huff, K., “Once-through benchmarks with cyclus,” in *ANS Student Conference*, Las Vegas, NV, 2011
- [17] Huff, K. D. Wilson, P. P. **Gidden, M. J.**, “Open Architecture and Modular Paradigm of Cyclus, a Fuel Cycle Simulation Code,” in *Transactions of the American Nuclear Society*, vol. 104, 2011, p. 183
- [18] Huff, K. Wilson, P. **Gidden, M.** Elmore, R., *Cyclus : An Open, Modular, Next Generation Fuel Cycle Simulator Platform*, Poster, Mar. 2011
- [19] **Gidden, M.** Livesay, J. York, R. Blessinger, C., “Collimation of radiation portal monitors to reduce the innocent alarm rate (poster),” in *Transactions of the American Nuclear Society*, Washington, DC, Nov. 2007
- [20] Krey, V. Havlik, P. Fricko, O. Zilliacus, J. **Gidden, M.** Strubegger, M. Kartasasmita, G. Ermolieva, T. Forsell, N. Gusti, M. Johnson, N. Kindermann, G. Kolp, P. McCollum, D. L. Pachauri, S. Rao, S. Rogelj, J. Valin, H. Obersteiner, M. Riahi, K., “MESSAGE-GLOBIOM 1.0 Documentation,” International Institute for Applied Systems Analysis (IIASA), Tech. Rep., 2016. [Online]. Available: <http://data.ene.iiasa.ac.at/message-globiom/>
- [21] **Gidden, M. J.**, “An Agent-Based Modeling Framework and Application for the Generic Nuclear Fuel Cycle,” Thesis, University of Wisconsin, Madison, WI, United States, Mar. 2015
- [22] **Gidden, M.**, “An agent-based modeling framework and application for the generic nuclear fuel cycle,” Prelim, University of Wisconsin, Madison, Sep. 2013. [Online]. Available: <http://dx.doi.org/10.6084/m9.figshare.1132596>

OTHER  
PUBLICATIONS

## SOFTWARE

- [23] Carlsen, R. W. **Gidden, M.** Huff, K. Opotowsky, A. C. Rakhimov, O. Scopatz, A. M. Welch, Z. Wilson, P., *Cyclus v1.0.0*, Jun. 2014. [Online]. Available: [http://figshare.com/articles/Cyclus\\_v1\\_0\\_0/1041745](http://figshare.com/articles/Cyclus_v1_0_0/1041745)
- [24] Carlsen, R. W. **Gidden, M.** Huff, K. Opotowsky, A. C. Rakhimov, O. Scopatz, A. M. Wilson, P., *Cycamore v1.0.0*, Jun. 2014. [Online]. Available: [http://figshare.com/articles/Cycamore\\_v1\\_0\\_0/1041829](http://figshare.com/articles/Cycamore_v1_0_0/1041829)
- [25] **Gidden, M.**, *Cyclopts*, <http://mattgidden.com/cyclopts/>, Dec. 2014. [Online]. Available: <http://mattgidden.com/cyclopts/>
- [26] Scopatz, A. **Gidden, M.** Welch, Z., “Polyphemus v0.1,” Jun. 2014. [Online]. Available: <http://dx.doi.org/10.6084/m9.figshare.1066058>
- [27] Scopatz, A. Bates, C. R. Biondo, E. Huff, K. Kiesling, K. Carlsen, R. Davis, A. **Gidden, M.** Haines, T. Howland, J. Huff, B. Manalo, K. Opotowsky, A. Slaybaugh, R. Relson, E. Romano, P. Shriwise, P. Xia, J. D. Wilson, P. Zachman, J., “Pyne progress report,” Nov. 2014. [Online]. Available: <http://dx.doi.org/10.6084/m9.figshare.1250143>

## REFERENCES

Available upon request