

## Matthew J. Gidden, Ph.D.

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CONTACT INFORMATION	International Institute for Applied Systems Analysis Schlossplatz 1, A-2361 Laxenburg Austria	<i>Mobile:</i> +43 (0)6 676 175 3442 <i>E-mail:</i> matthew.gidden@gmail.com <i>Website:</i> mattgidden.com <i>Github:</i> gidden
CITIZENSHIP	USA	
RESEARCH INTERESTS	Energy systems, energy policy, scientific computation, nuclear fuel cycle analysis, agent-based modeling, advanced nuclear reactors, nuclear nonproliferation	
EDUCATION	<b>PH.D., Nuclear Engineering, University of Wisconsin - Madison</b> <b>March 2015</b> <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> <b>MASTERS, Nuclear Engineering, University of Wisconsin - Madison</b> <b>December 2011</b> <b>B.S., Nuclear Engineering, Texas A&amp;M University</b> <b>May 2009</b> <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	<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.  <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.  <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.  <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.  <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.  <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.  <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.	
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>Elsevier Energy Forum</b> , Member	2017 – Present
ORGANIZATIONS &	<b>European Geosciences Union</b> , Member	2016 – Present
SERVICE	<b>Institute for Operations Research and Management Science</b> , Member	2014 – Present
	<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 <b>Cyclus</b> and <b>PyNE</b> .	

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, PyTest, Nose
NE Applications	MCNP, Origen
Other Applications	Jupyter Notebooks

FAMILIAR

Languages	R, Java, FORTRAN, Visual Basic, Perl
Version Control	Mercurial, Subversion
Tools	Jekyll, JSON
NE Applications	DRAGON, TransLAT
Other Applications	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

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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  
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- [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. Wilson, 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] Wilson, P. P. H. Scopatz, A. **Gidden, M.** Carlsen, R. Mouginot, B. Flanagan, R., *Market-Based and System-Wide Fuel Cycle Optimization*. 2017. [Online]. Available: <http://www.osti.gov/scitech/servlets/purl/1363866>
- [21] Krey, V. Havlik, P. Fricko, O. Zilliacus, J. **Gidden, M.** Strubegger, M. Kartasmita, 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/>
- [22] **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

OTHER  
PUBLICATIONS

[23] **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>

SOFTWARE

[24] 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)

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[26] **Gidden, M.**, *Cyclopts*, <http://mattgidden.com/cyclopts/>, Dec. 2014. [Online]. Available: <http://mattgidden.com/cyclopts/>

[27] Scopatz, A. **Gidden, M.** Welch, Z., “Polyphemus v0.1,” Jun. 2014. [Online]. Available: <http://dx.doi.org/10.6084/m9.figshare.1066058>

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