

Matthew J. Gidden, Ph.D.

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	Nuclear fuel cycle simulation and analysis, agent-based modeling, linear/non-linear optimization techniques, simulation execution leveraging high throughput computing, energy policy, nuclear non-proliferation, reactor physics simulations for fuel cycles, advanced nuclear fuel cycles	
EDUCATION	PH.D., Nuclear Engineering, University of Wisconsin - Madison March 2015 <ul style="list-style-type: none">• An Agent-Based Modeling Framework and Application for the Generic Nuclear Fuel Cycle• Advisor: Professor Paul P.H. Wilson MASTERS, Nuclear Engineering, University of Wisconsin - Madison December 2011 B.S., Nuclear Engineering, Texas A&M University May 2009 <ul style="list-style-type: none">• <i>Summa cum Laude</i>, With Honors in Engineering• Minor in Mathematics	
HONORS & AWARDS	2 nd Place in Energy Policy, Innovations in Fuel Cycle Research 2014 Winner, The Why Files Cool Science Image Contest 2014 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	
RESEARCH EXPERIENCE	International Institute for Applied Systems Analysis, Energy Group, Laxenburg, AUSTRIA Oct 2015 – Present <i>Research Scholar</i> Performed large-scale integrated assessment modeling exercises and specialized in GIS-based spatial modeling and analysis. University of Wisconsin, NE Dept., Madison, WI Apr – Oct 2015 <i>Postdoctoral Researcher</i> Investigated novel methods for modeling recycle fuel fabrication in NFC simulations. University of Wisconsin, NE Dept., Madison, WI Aug 2010 – Mar 2015 <i>Graduate Research Assistant</i> Aug 2009 – Jan 2010 Developed and extended the Cyclus NFC simulator to model generic nuclear fuel cycles. AREVA, Paris, FRANCE Feb – Jul 2010 <i>Research Intern (Stagiaire), Core Design Group</i> Simulated and analyzed a boron dilution accident in multiple reactor configurations using MCNP. Pacific Northwest National Lab, Richland, WA Jun – Aug 2009 <i>Research Assistant</i> Analyzed a design of an automated verification unit for canisters of enriched UF ₆ using MCNP.	

TN International (AREVA), Montigny-le-Bretonneux, FRANCE **Jun – Aug 2008**
Research Intern, Materials Group
 Analyzed material suitability for nuclear cask shock absorber via dynamic compression testing.

Oak Ridge National Lab, Oak Ridge, TN **Jun – Aug 2007**
Research Assistant **Jun – Aug 2006**
 Tested the collimation of radiation portal monitors for use with the U.S. Megaports Initiative.

PROFESSIONAL ORGANIZATIONS & SERVICE	<p>Elsevier Energy Forum, Member 2017 – Present</p> <p>European Geosciences Union, Member 2016 – Present</p> <p>Institute for Operations Research and Management Science, Member 2014 – Present</p> <p>American Nuclear Society, Member 2006 – Present</p> <p style="padding-left: 20px;">Communications Committee, Member 2013 – Present</p> <p style="padding-left: 20px;">Public Policy Committee, Member 2013 – Present</p> <p style="padding-left: 20px;">Special Advisory Committee on Nuclear Nonproliferation, Member 2012 – 2016</p> <p style="padding-left: 20px;">Student Sections Committee, Member 2010 – 2016</p> <p style="padding-left: 20px;">Local Sections Committee, Member 2010 – 2012</p> <p style="padding-left: 20px;">Nuclear Nonproliferation Special Committee, Member 2010 – 2012</p> <p style="padding-left: 20px;">ANS Student Conference, Co-Chair 2008</p> <p>Institute of Nuclear Materials Management, Member 2008 – Present</p> <p>Alpha Nu Sigma, Member 2009 – Present</p> <p>Nuclear Engineering Student Delegation, Delegate 2011 – 2013</p> <p style="padding-left: 20px;">Chair 2013</p> <p style="padding-left: 20px;">Vice Chair 2012</p> <p>American Nuclear Society, Texas A&M Chapter, Member 2005 – 2009</p> <p style="padding-left: 20px;">Vice President 2006 – 2007</p>
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JOURNAL PUBLICATIONS	<p>[1] Gidden, M. J. Wilson, P. P., “A methodology for determining the dynamic exchange of resources in nuclear fuel cycle simulation,” <i>Nuclear Engineering and Design</i>, 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</p> <p>[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,” <i>Advances in Engineering Software</i>, 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</p> <p>[3] Pearce, T. M. Williams, J. J. Kruzal, S. P. Gidden, M. J. Williams, J. C., “Dynamic control of extracellular environment in in vitro neural recording systems,” <i>Neural Systems and Rehabilitation Engineering, IEEE Transactions on</i>, vol. 13, no. 2, pp. 207–212, 2005</p>
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REFEREED PROCEEDINGS	<p>[4] Gidden, M. Wilson, P., “Dynamic resource exchange with coinor-cbc in cyclus, a nuclear fuel cycle simulator,” in <i>Operations Research and Computing: Algorithms and Software for Analytics</i>, Richland, VA, United States, Jan. 2015</p> <p>[5] Gidden, M. Carlsen, R. Opotowsky, A. Rakhimov, O. Scopatz, A. Wilson, P., “Agent-based dynamic resource exchange in cyclus,” in <i>Proceedings of PHYSOR</i>, Kyoto, Japan, Sep. 2014</p> <p>[6] Gidden, M. Wilson, P., “An agent-based framework for fuel cycle simulation with recycling,” in <i>Proceedings of GLOBAL</i>, Salt Lake City, UT, United States, Sep. 2013</p>
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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_{ix} 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. 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,

OTHER
PUBLICATIONS

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

[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

[25] 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

[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>

[28] 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>

I have deep and broad software development skills and experience. I help maintain and manage a number of open source scientific software packages including *Cyclus* and *PyNE*.

COMPUTATIONAL SKILLS

EXPERT (5+ YEARS EXPERIENCE)

Languages	C++/C, Python
Build Systems	CMake, Make, Autoconf/Automake
Version Control	Git
Tools	L ^A T _E 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