

## Mark Kamuda

### Home Address

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### Contact

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**Citizenship** U.S.A.

**Education** M.S. in Nuclear, Plasma, and Radiological Engineering, University of Illinois at Urbana-Champaign **2017**

- “Automated Isotope Identification Algorithm Using Artificial Neural Networks.”
- Advisor: Professor Clair J. Sullivan

B.S. in Nuclear, Plasma, and Radiological Engineering, University of Illinois at Urbana-Champaign **2014**

**Experience** **PhD Research Fellow**, UIUC, Urbana, IL **May 2017 - May 2019 (expected)**

- Applied machine learning methods to automated isotope identification
- Advisor: Professor Kathryn D. Huff

**Guest Scientist**, Los Alamos National Laboratory, Los Alamos, NM **Summer 2015**

- Analyzed legacy spectroscopic data to increase the accuracy of the measured gamma-ray branching ratios for  $^{147}\text{Nd}$
- Performed gamma-ray spectroscopy measurements at the Nevada National Security Site

**Teaching Assistant**, UIUC, Urbana, IL **Spring 2013, Spring 2014**

- Nuclear Weapons and Arms Control (PHYS 280)

**Undergraduate Research Assistant**, UIUC, Urbana, IL **2013-2014**

- Undergraduate Research Assistant to Dr. Clair J. Sullivan: Set up and calibrated radiation detectors for research experiments
- Measured the detector response and efficiency of a NaI detector

**Engineering Outreach Society, President**, UIUC, Urbana, IL **Aug 2013 - May 2014**

- President of the Engineering Outreach Society (EOS), a University recognized Registered Student Organization (RSO)
- Managed a volunteer club of about 50 students
- Organized weekly science demonstrations at two local elementary schools

**Guest Scientist**, Brookhaven National Laboratory, Brookhaven, NY **Summer 2013**

- Simulated a novel collimator design in Geant4
- Analyzed the performance of the novel collimator for a specific imaging application
- Presented our work in a poster and published article

### Publications

M. Kamuda and C.J. Sullivan . An Automated Isotope Identification and Quantification Algorithm for Isotope Mixtures in Low-Resolution Gamma-ray Spectra. *Radiation Physics and Chemistry*. In review. **2018**

M. Kamuda. “Automated Isotope Identification Algorithm Using Artificial Neural Networks”. *MS Thesis*. University of Illinois at Urbana-Champaign. **2017**

M. Kamuda, J. Stinnett, and C.J. Sullivan . Automated Isotope Identification Algorithm Using Artificial Neural Networks. *IEEE Transactions on Nuclear Science*. **2017**

J. Mattingly, J. Hutchinson, C. Sullivan, J. Stinnett , M. Kamuda, M. Alamaniotis, B. Simms, J. Mueller, J. Newby, J. Linkous, S. Pozzi, K. Polack, M. Hamel, Z. He, D. Goodman, and M. Streicher. ”CNEC and CVT Subcritical Experiments with Category I Special Nuclear Material at the Nevada National Security Site Device Assembly Facility.” *Institute of Nuclear Materials Management Conference Record*. **2016**

Mark Kamuda, Yonggang Cui, Terry Lall, Jim Ionson, Giuseppe S. Camarda, Anwar Hossainm, Ge Yang, Utpal N. Roy, and Ralph B. James. Modeling Of A Slanted-hole Collimator In A Compact Endo-cavity Gamma Camera. *SPIE Proceedings*. **2013**

## Conference Presentations

M. Kamuda. "Uranium Enrichment Measurements Using an Artificial Neural Network." *CVT Workshop*. Ann Arbor, MI. **2017**

M. Kamuda and C.J. Sullivan. "Automated Isotope Identification Algorithm Using Artificial Neural Networks." *UPR*. Walnut Creek, CA. **2017**

M. Kamuda and C.J. Sullivan. "An Automated Isotope Identification and Quantification Algorithm for Isotope Mixtures in Low-Resolution Gamma-ray Spectra." *IRRMA-X*. Chicago, IL. **2017**

M. Kamuda, J. Stinnett, C.J. Sullivan. "Peak Quantification with Neural Networks for Low-Resolution NaI Spectra." *IEEE Nuclear NSS/MIC*. Strasbourg, France. **2016**

M. Kamuda and C.J. Sullivan. "An Automated Isotope Identification and Quantification Algorithm for Isotope Mixtures in Low-Resolution Gamma-ray Spectra." *SORMA*. Berkeley, CA. **2016**

M. Kamuda, M.M. Watson, and C.J. Sullivan. "Information Barriers based on Enhanced Automated Isotope Identification." *UITI*. Ann Arbor, MI. **2015**

## Guided Discussions

M. Kamuda and J. Wilson. "Data Mining and Machine Learning." *The Hacker Within*. Champaign-Urbana, IL. **February, 2018**

M. Kamuda. "Natural Language Processing." *The Hacker Within*. Champaign-Urbana, IL. **November, 2017**

M. Kamuda. "Introduction to TensorFlow." *The Hacker Within*. Champaign-Urbana, IL. **September, 2017**

## Programming

Python (Numpy, Pandas, Matplotlib, Scikit-learn, Jupyter Notebooks, Tensorflow), LaTeX, JavaScript, MATLAB, Mathematica, MCNP6, Geant4