Jacob Stinnett stinnettjacob@gmail.com
PhD Candidate, NRC Research Fellow 405.509.4584

Education

- **University of Illinois at Urbana-Champaign** Urbana, IL
  PhD in Nuclear, Plasma, and Radiological Engineering *December 2016*
  Dissertation: "Automated Isotope Identification Algorithms for Low-Resolution Gamma Spectrometers"
- **University of Illinois at Urbana-Champaign** Urbana, IL
  MS in Nuclear, Plasma, and Radiological Engineering *May 2014*
- **University of Oklahoma** Norman, OK
  BS in Physics and BA in Mathematics *May 2012*

Experience

- **University of Illinois at Urbana-Champaign** Urbana, IL
  NRC Research Fellow *May 2013- Present*
  - **Isotope Identification**: Developed various Bayesian classifiers for automated isotope identification on low-resolution gamma-ray detectors. Feature likelihoods were modeled both analytically and empirically (large simulations and KDE approach).
  - **Feature Extraction**: Various contributions to a wavelet/NNLS feature extraction code, including line-detection routines and porting the code to Python.
  - **Library Generation**: Created method to generate tailored isotope libraries for different detectors that is coupled to the feature extraction method. This method also reduces the library footprint from 280MB to 23MB.
  - **Data Simulations**: Wrote particle simulations to build detector response functions and Python code to interpolate and randomly sample responses to simulate detector data.
  - **Neural Networks**: Wrote a simulated annealing training method in MATLAB and showed proof of concept for using NNs for spectra classification.
- **Los Alamos National Laboratory** Los Alamos, NM
  Guest Scientist *Summer 2015*
  - **Neutron Simulations**: Built Monte Carlo simulations of neutron radiation sources in MCNP for nuclear security purposes.
  - **Gamma Spectroscopy**: Measured spectra of Category I quantities of special nuclear materials at the Nevada National Security Site.
- **University of Illinois at Urbana-Champaign** Urbana, IL
  Teaching Assistant *August 2012- May 2013*
  - **NPRE451 Nuclear Radiations Lab**: Led a lab section covering nuclear instrumentation, radiation data analysis, and nuclear safety.
  - **NPRE446 Interactions of Radiation with Matter**: Head TA for course on classical and quantum mechanics for engineers, with emphasis on neutron and electron interactions.
- **University of Oklahoma** Norman, OK
  Undegraduate Research Assistant *Jan 2009 - May 2012*
  - **Diatomic Spectroscopy**: Electrodynamic calculations of and simulations for molecular complexes to explain published but anomolous experimental data.

Selected Papers

- **Performance of an Automated Isotope Identification Algorithm for Handheld NaI Detectors**: J. Stinnett and C.J. Sullivan. *IEEE Nuclear Science Symposium Conference Record.* 2015
- **Validation of a Bayesian-Based Isotope Identification Algorithm**: C.J. Sullivan and J. Stinnett. *Nuclear Instruments and Methods in Physics Research A.* 2014

Programming Skills

- **Languages**: Python, MATLAB, Wolfram Language