

# MING FANG

+1 217-305-1769 • mingf2@illinois.edu

## EDUCATION

---

- PhD Student** | *Nuclear, Plasma, and Radiological Engineering* Jan 2020 – Present  
University of Illinois at Urbana-Champaign (UIUC) Urbana, USA
- Cumulative GPA: 4.0 / 4.0
- Master of Science** | *Nuclear, Plasma, and Radiological Engineering* Aug 2018 – Dec 2019  
University of Illinois at Urbana-Champaign (UIUC) Urbana, USA
- Cumulative GPA: 4.0 / 4.0
- Bachelor of Engineering** | *Nuclear Engineering and Technology* Sept 2014 – June 2018  
University of Science and Technology of China (USTC) Hefei, China
- Cumulative GPA: 3.89 / 4.3

## RESEARCH INTEREST

---

- Radiation detection in security and medical applications
- Development of readout electronics and data processing algorithms

## RESEARCH EXPERIENCE

---

- Multi-Mode Imaging for TRISO-fueled Pebble Identification** Aug 2020 - Present  
UIUC Urbana, USA
- Designed a neutron multiplicity counter to perform non-destruction assay of fuel pebbles.
  - Implemented an accelerated Monte-Carlo algorithm to simulate X-ray images of a pebble generated by an industrial CT scanner.
- Quantitative Image Reconstruction in Passive Gamma Emission Tomography** Aug 2019 – Sept 2020  
UIUC Urbana, USA
- Developed a linear forward model to characterize the imaging system response.
  - Implemented an accelerated Monte Carlo algorithm to perform scattering correction.
  - Developed a full set of software to reconstruct cross-sectional images of inspected fuel assemblies, identify missing fuel pins, and estimate fuel pin activities.
- Active Interrogation Using a DD Neutron Generator** May 2019 – May 2020  
UIUC Urbana, USA
- Implemented a shift-register algorithm to calculate the coincidence neutron count rate.
  - Demonstrated the possibility of using a DD generator as a neutron active interrogation source based on the strong correlation between the time-dependent neutron count rate signature and uranium mass.
- Fellow of Exotic Beam Summer School** Jun 2019  
Oak Ridge National Laboratory Oak Ridge, USA
- Learnt about the various facets of the science of exotic nuclei including nuclear structure, fundamental interactions, and the application of nuclear science and technology.
- Positron Annihilation Lifetime Spectroscopy (PALS)** Jan 2019 – May 2019  
UIUC Urbana, USA
- Developed and optimized a PALS experimental setup using organic scintillators and fast digitizers.
  - Implemented an interpolation-based constant-fraction discrimination (CFD) timing algorithm to determine the pulse arrival time.
- General-Purpose Pulse-Processing Program** Sept 2018 – Present  
UIUC Urbana, USA
- Developed a fast and general-purpose pulse-processing program based on the CERN ROOT framework.
- Implementation of Key Algorithms in Gamma Spectrum Analysis Software** Jul 2017 – Mar 2018  
USTC Hefei, China
- Implemented pulse smoothing, peak finding and background subtraction algorithms in C++.
  - Implemented energy calibration algorithm in C++.

## PUBLICATIONS

---

### Journal

1. **Ming Fang**, Yoann Altmann, Daniele Della Latta, Massimiliano Salvatori, and Angela Di Fulvio. Quantitative imaging and automated fuel pin identification for passive gamma emission tomography. *Scientific Reports*
2. **Ming Fang**, Nathan Bartholomew, and Angela Di Fulvio. Positron annihilation lifetime spectroscopy using fast scintillators and digital electronics. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 943:162507, 2019
3. Noah Rebei, **Ming Fang**, and Angela Di Fulvio. Quantitative and three-dimensional assessment of holdup material. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 984:164630, 2020

### Conference Proceedings

1. **Ming Fang**, Nathan Bartholomew, and Angela Di Fulvio. Timing performance of organic scintillators for positron annihilation lifetime spectroscopy. In *2019 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC)*, pages 1–5. IEEE
2. **Ming Fang**, Daniele Della Latta, Yoann Altmann, Massimiliano Salvatori, and Angela Di Fulvio. Computational Methods for Pin Identification in Passive Gamma Emission Tomography. Baltimore, Maryland, USA, July 2020. INMM 61st Annual Meeting
3. **Ming Fang**, Yoann Altmann, Daniele Della Latta, Massimiliano Salvatori, and Angela Di Fulvio. Attenuation and Scattering Correction in Passive Gamma Emission Tomography Reconstruction. Boston, MA, USA, December 2020. 2020 IEEE NSS-MIC

## PRESENTATIONS

---

1. Positron annihilation lifetime spectroscopy using fast scintillators and digital electronics. Manchester, UK, November 2019. 2019 IEEE Nuclear Science Symposium and Medical Imaging Conference
2. Computational methods for pin identification in passive gamma emission tomography. Virtual Conference, July 2020. INMM 61st Annual Meeting
3. Comparison of image reconstruction methods for simulated passive gamma emission tomography. Virtual Conference, November 2020. 2020 IEEE Nuclear Science Symposium and Medical Imaging Conference

## APPOINTMENTS

---

<b>Graduate Research Assistant</b> Neutron Measurement Laboratory	Sept 2018 – Present Urbana, USA
--	------------------------------------

## TEACHING AND MENTORING

---

<b>Mentor</b> UIUC	Sept 2018 – Aug 2020 Urbana, USA
-----------------------	-------------------------------------

- Muzammil Siddiqui, Undergraduate, UIUC.
- Noah Rebei, High school student, University Laboratory High School

<b>Undergraduate Teaching Assistant</b> USTC	Sept 2017 – Jan 2018 Hefei, China
---	--------------------------------------

- Course: Physics, Subject: Quantum Mechanics B.

## SKILLS

---

**Programming:** C/C++, Python (NumPy, SciPy, Matplotlib), Bash

**Document Creation:**  $\text{\LaTeX}$ , Markdown, Microsoft Office Suite

**Software:** MCNP, MATLAB, Mathematica, ROOT, Git, CMake, Make, SOLIDWORKS, Origin, Vivado

## HONORS AND AWARDS

---

Outstanding Teaching Assistant	Mar 2018
Outstanding Student Scholarship	2017
Institute of Modern Physics, Chinese Academy of Sciences Scholarship	2017
Outstanding Student Scholarship	2016
Institute of Modern Physics, Chinese Academy of Sciences Scholarship	2015
Outstanding Freshman Scholarship	2014