

MING FANG

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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

- Development of non-destructive assay methods of special material for the characterization of tri-structural isotropic particle (TRISO) fuel for pebble bed reactors and use of advanced techniques, such as positron lifetime spectroscopy, and development of single-volume scatter camera with SiPM scintillator readout
- Radiation detector signal processing algorithms with a focus on accelerated Monte Carlo implementation and iterative linear inverse solver for image reconstruction.

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.
- 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

Peer-Reviewed Journal Publications

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

Proceedings at International Conferences

1. **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
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**, 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

PRESENTATIONS AT INTERNATIONAL CONFERENCES

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

APPOINTMENTS

Graduate Research Assistant	Sept 2018 – Present
Neutron Measurement Laboratory	Urbana, USA

TEACHING AND MENTORING

Outreach Activities	Mar 2020
UIUC	Urbana, USA

- Host a Q&A session on our research for students in Academic Redshirt in Science and Engineering (ARISE).

Mentor	Sept 2018 – Aug 2020
UIUC	Urbana, USA

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

Undergraduate Teaching Assistant

USTC

Sept 2017 – Jan 2018

Hefei, China

- Course: Physics, Subject: Quantum Mechanics B.

SKILLS

Programming: C/C++, Python (NumPy, SciPy, Matplotlib), Bash**Document Creation:** \LaTeX , Markdown, Microsoft Office Suite**Software:** MCNP, MATLAB, Mathematica, ROOT, Git, CMake, Make, SOLIDWORKS, OrCAD Capture and PCB Editor, Origin, Vivado**HONORS AND AWARDS**

Fellow of Exotic Beam Summer School

Jun 2019

Oak Ridge National Laboratory

Outstanding Teaching Assistant

Mar 2018

USTC

Outstanding Student Scholarship

May 2017

USTC

Institute of Modern Physics, Chinese Academy of Sciences Scholarship

Sept. 2017

USTC

Outstanding Student Scholarship

May 2016

USTC

Institute of Modern Physics, Chinese Academy of Sciences Scholarship

Sept. 2015

USTC

Outstanding Freshman Scholarship

Sept. 2014

USTC

PROFESSIONAL SOCIETIES

- Student member of Institute of Nuclear Materials Management