Ruoyan Jin

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PERSONAL STATEMENT

PhD student in computational materials science, specializing in atomic-scale simulations. Current research leverages machine-learning interatomic potentials to study radiation damage in semiconductors, with a broad interest in applying machine learning techniques to materials research. Experience includes publishing in peer-reviewed journals and presenting at workshops and conferences.

EDUCATION

PhD in Engineering Physics — Aug 2023 - Present
Aalto University, Finland
Research focus: Investigation of radiation damage using machine-learning interatomic potentials

MSc in Physics — June 2023
University of Electronic Science and Technology of China (UESTC), China
Thesis: First-principles investigation of radiation effects in uranium compounds

BEng in Computer Science — June 2018
Yanbian University, China

RESEARCH EXPERIENCE

PhD Researcher

- Investigated radiation damage in semiconductors using machine-learning interatomic potentials (Gaussian Approximation Potential).
- Developed a complete workflow from potential training to evaluation; code available at GitHub.
- Contributed to publications and presentations at international workshops.

MSc Research Project

- Conducted first-principles investigations of radiation effects in uranium compounds.
- Findings led to peer-reviewed publications and a patent.

PUBLICATIONS & PATENTS

1. **Ruoyan Jin** et al., *Ab Initio Molecular Dynamics Study of Electron Excitation Effects on UO_2 and U_3Si*, *Materials*, 16(21), 6911 (2023).
2. **Ruoyan Jin** et al., *First-principles study of the stability and migration of Xe and Cs in U_3Si*, *Journal of Condensed Matter Physics*, 34(50), 505502 (2022).
3. **Ruoyan Jin** et al., *A new method for materials amorphization*, Chinese Patent Application No.: 202210942159X.
4. **Ruoyan Jin** et al., *Data-efficient machine-learning interatomic potential for studying radiation effects in germanium*, manuscript submitted to *npj Computational Materials*.

PRESENTATIONS

- Poster: GAP/(M)ACE Developers & Users Meeting 2024, Berlin, Germany: *Developing a general-purpose machine learning interatomic potential for Ge*.
- Oral: MRS Fall Meeting 2024, Boston, USA (accepted not presented due to funding)

TECHNICAL SKILLS

- Developed and applied machine learning algorithms, including regression models and neural networks, in Python using PyTorch.
- Leveraged HPC and GPU computing to run large-scale simulations efficiently.
- Experienced with atomistic simulation tools, including LAMMPS and VASP.

AWARDS & HORNORS

- **Third-Class Scholarship for Academic Excellence**, UESTC, 2021–2022, 2022–2023
- **Outstanding Teaching Assistant**, UESTC, 2021–2022

WORK EXPERIENCE

Software Engineer – Beijing Fujitsu System Engineering Co., Ltd, China | 2018–2019

- Developed and maintained software applications for the Panasonic production system.
- Collaborated with a team to design, implement, and optimize software solutions.
- Gained experience in programming, debugging, and software lifecycle management.