Marium Mostafiz Mou

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EDUCATIONAL QUALIFICATION

North Carolina State University August 2023 - Present
PhD in Materials Science and Engineering

Master's in Materials Science- CGPA: 3.97/4.00 June 2021- May 2023
Recipient of Physics and Astronomy Department and Friends Scholarship

Bangladesh University of Engineering & Technology (BUET) February 2016 - February 2021
Bachelor of Science in Naval Architecture & Marine Engineering- CGPA: 3.74/4.00

- Merit Position 3rd among 57 students
- Achieved Dean's list scholarship 1 time, University Merit Scholarship 4 times and University Stipend 1 time.

RESEARCH EXPERIENCE

North Carolina State University August 2023 - Present
Graduate Thesis & Projects

- The Rule-of-Mixtures and the twin energy of High Entropy Carbides

Missouri State University June 2021 – May 2023
Graduate Thesis & Projects

- Machine Learning Strategies for Potential Development in High- Entropy Driven Nickel-Based Superalloys
  i. Developed Deep Learning interatomic potentials to model a multi-phase and multi-component system of Ni-based Superalloys.
  ii. Utilized invariant scalar-based and/or equivariant, tensor-based neural network (NN) approach.

Bangladesh University of Engineering & Technology (BUET) June 2019 - February 2021
Undergraduate Thesis & Projects

- Computational Fluid Dynamics Analysis of an Inland Cargo Vessel
  i) Prediction of the calm water resistance, sinkage, trim using Finite volume-based commercial code STARCCM+
  ii) Verification and Validation (V&V) procedure for assessment of the uncertainties and numerical errors

SKILLS

Visualization, Graphical & Data Analysis Software	• OVITO, VESTA, OriginPro, Visual Molecular Dynamic (VMD), TOPAS, LabVIEW
Computational Tools	• Molecular Dynamic Simulation Code: LAMMPS • DFT Calculation of electronic and magnetic properties: Quantum Espresso • Ab initio quantum mechanical calculations: VASP • Analysis of lattice anharmonicity and lattice thermal conductivity: ALAMODE
Machine Learning interatomic potential Packages	DeePMD-Kit, SNAP, Allegro
Data Analysis Tools	SQL, Tableau, Microsoft Excel
Programming Languages	Python, C++ (Intermediate), Fortran (Intermediate), MATLAB(Intermediate)
Computer Aided Design & General Software	AutoCAD, Rhinoceros, Microsoft Office
CFD Simulation Software	StarCCM+, Pointwise
Technical Skills	Fluid Mechanics, Ship design and drawing

WORK EXPERIENCE

- **Missouri State University** June 2021- December 2021
  Graduate Research Assistant

- Worked under advised faculty and conducted 20 hours of research weekly by presenting ideas, results in both verbal and written form.
- Produced and analysed varieties of data from varying data sets to find symmetry for Deep Learning Potential by statistical analysis of results.
- Contributed to different projects by preprocessing data and by implementing algorithms using both toolkits and self-developed code.
- Published research work in APS March Conference 2022 and co-authored in MRS Advances Journal.

- **Missouri State University** January 2022 – May 2023
  Graduate Teaching Assistant

- Demonstrated strong organizational skill by teaching related theories and instructing undergraduate class of Introduction to Physics-II and Foundations of Physics-II lab courses.
- Attended weekly TA meeting with lab supervisor and fellow TAs to enhance teaching materials (lab manuals), inspect lab instruments to ensure the overall quality of the course, and supervised experiments, prepared quizzes, graded lab reports and provided feedback to students

PROJECTS

- 'Cell Cycle Automation using LabVIEW for Characterization of Ni-Zn Cell' (2023)
- 'Fabrication and Characterization of PLD grown In_2O_3/BTO bi-layered Thin Film FET.' Final project for Materials Synthesis & Characterization Course. (2022)
- Project on the design of 2000 DWT Oil Tanker (2019)
  - Design of a particular ship, general arrangement (GA), freeboard, volume, scantling, lightweight and deadweight, midship, profile, deck and bottom construction based on Rule Book, shell expansion, hydrostatic curves, trim and cross curves of stability, power, engine selection and propeller design.
- Shipyard practice in Chittagong Dry Dock Limited (2018)
  - Ship design: basic design, estimation, hull design, piping and equipment design, shell expansion, detailed construction drawings. Ship construction: mould loft, gas cutting, CNC cutting, welding, fabrication, sub-assembly, assembly, field assembly, erection, launching, outfitting, delivery trial, Diesel engine workshop practice.

PUBLICATIONS

- McGilvry-James, T., Timalsina, B., Mou, M.M. *et al.* Deep potential development of transition-metal-rich carbides. *MRS Advances* **7**, 468–473 (2022).
- Rahaman, M. M., Zakaria, N. M. G., Mostafiz, M., & Islam, H. (2022). A comparative study for resistance prediction using different RANS solvers. *Trends in Maritime Technology and Engineering Volume 1*, 425-434.

ACTIVITIES AND ACHIEVEMENTS

- Won First Runner Up Prize for poster titled "**Artificial Intelligence (AI) to design materials for Advanced Turbine Engines**" at MOCAP Annual Summit Poster Presentation Competition
- Mentored students in Physics, Astronomy and Materials Science Help Desk.
- Volunteered in Ozarks Food Harvest, Springfield 2022
- Member of BUET DANCE CLUB (2017)
- Winner of the 'NAME DEPARTMENT WOMEN'S BADMINTON TOURNAMENT 2019'
- Founding member of COVID-19 general awareness app "Obogoto"

HONORS AND AWARDS

- Recipient of Physics and Astronomy Department and Friends Scholarship (2022-2023).
- Achieved Dean's list scholarship 1 time, University Merit Scholarship 4 times and University Stipend 1 time.

REFERENCES

Dr. Donald Brenner
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Dr. Ridwan Sakidja
Professor Dept. of Physics, Astronomy and Materials Science Missouri State University, Springfield, MO, USA
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