ZINIA SULTANA JOTI

zinia.sultana09@gmail.com researchgate/ZiniaSultanaJoti linkedin.com/ziniasultana github.com/Zinia-Sultana

Research Interests

- Molecular Dynamics
- Materials Science
- Composite Materials
- Machine Learning

Education

Jahangirnagar University (JU) Dhaka, Bangladesh
M.Sc. in Applied Statistics and Data Science (On-going) January 2024 – Present
CGPA: 4.0/4.0 (1st semester)
Relevant Coursework: Probability and Probability Distribution, Inference, Machine Learning, Multivariate

Shahjalal University of Science & Technology (SUST) Sylhet, Bangladesh
B.Sc. in Mechanical Engineering January 2017 – August 2021
CGPA: 3.37/4.0 (3.68 in the last 62.0 credits)
Awards: Dean's Award 2020
Relevant Coursework: Engineering Materials, Fluid Dynamics I - II, Applied Engineering Mathematics

Standardized Test Scores

IELTS: 7.5 (Listening: 8, Reading: 8, Writing: 6.5, Speaking: 6.5)
GRE: 308 (Quant: 161, Verbal: 147, AWA: 3.5)

Publications

- Zinia Sultana Joti and Mohammad Samiul Hasan. A Molecular Dynamics Study on the Mechanical Properties of Fe-Cu-Ni Nanopillar Under Uniaxial Tensile Load. ICMAAM 2024. [Submitted]
- Mohammad Samiul Hasan and Zinia Sultana Joti. Tensile Mechanical Performance of Horizontally Twinned Al Nanopillar by Molecular Dynamics Analysis. [In preparation]
- Zinia Sultana Joti. A Comparison Study of Metals Mechanical Properties Under Tensile Loading Using Molecular Dynamics Simulations. Pre-print. ResearchGate.

Research And Analytical Experience

Research Assistant October 2022 – December 2022

Topic: Study of the atomistic deformation behavior of Au nanopillar with kinked twin boundaries using Molecular Dynamics.
Supervisor: Md. A.K.M. Ashikuzzaman, Lecturer, Department of Mechanical Engineering, SUST.

- Simulated tensile loading test for Au models (21) with 0 to 7 twins with variations of the kinked length (0.25L, 0.50L, 0.75L).
- Observed the deformation mechanism of the models using OVITO.
- Analyzed the stress strain data using Origin and compared the progression with each model.

Undergraduate Thesis March 2020 – August 2021

Topic: Analysis of Composite Laminated Plate: Lightning Protection Effect and Damage Mechanism.

Supervisor: Late Mahfuzur Rahman, Assistant Professor, Department of Mechanical Engineering, SUST.

- Conducted a literature review on composite-based laminated structure for aircraft construction by thoroughly assessing relevant research papers which focuses on the challenges faced by aircraft such as lightning strikes, bird impacts and turbulence.
- Modeled lightning strike protection (LSP) plate in Abaqus using Carbon Fiber Reinforced Composite (CFRP) plates with Carbon Nanotube (CNT) layers with a ply stack-up of $[+45/0/-45/90]_{3s}$ for quasi-isotropic structure.
- Analyzed the progressive failure utilizing the PUCK failure criteria to assess suitability for aerospace application.

Projects

Data Analyst (Bangla AI) September 2018 – April 2019

Topic: Development of a Bipedal Humanoid Robot "Lee"
Team Lead: Noushad Shojib, Friday Lab, RoboSUST, SUST.

- Analyzed a substantial number of conversations systematically to discern underlying patterns of communication dynamics.
- Worked with datasets to extend conversational durations, employing techniques that fostered meaningful interactions and resulted in increased engagement.
- Published an informative Wikipedia article on Ribo, Bangladesh's first humanoid robot.

Design and Development of Autonomous Fire Fighting Robot July 2019 – October 2019

- Collaborated and lead a 3 persons team where distributed the work as mechanical, software and documentation.
- Designed a compact structure that allows it to reach for the narrow areas and some parts were printed using 3D printer.
- Operated drill machine, grinding machine and cut-off saw to prepare the chassis.
- Programed the code in Arduino for control mechanism.

Arduino-Controlled Autonomous Line Following Robot April 2017 – December 2018

- Gained hands-on experience with Arduino programming.
- Designed a line-following robot with Bluetooth controller and automated PID controller.

Professional Experience

Fellow, Teach For Bangladesh November 2021 – July 2022

- Acted as a STEM educator to 240 students regularly in an economically challenged high school by applying the "Teach Like A Champion" teaching methodology.
- Implemented blended learning during the second phase of Covid while providing distance learning materials.
- Executed a project regarding Social and Emotional Learning that improved students' emotional well-being.
- Attended in several professional and leadership trainings for personal development from different international leaders around the world.
- Conducted community project to build awareness among local for plastic waste with a group of 3 fellows.

Industrial Trainee, Energypac Engineering Limited December 2019 – January 2020

- Observed the maintenance system and fabrications of various parts required to build transformer.
- Learned about the production process of transformer.
- Reported daily learnings and prepared a documentation on the entire training.

Certification Courses

Learn to Program: The Fundamentals, University of Toronto, Coursera

Learn to Program: Crafting Quality Code, University of Toronto, Coursera

SQL for Data Science, University of California, Coursera

Introduction to Data Analysis with Excel, Rice University, Coursera

Python Basics, University of Michigan, Coursera

Introduction to Programming with MATLAB, Vanderbilt University, Coursera

Cocurricular Activities

Vice President R&D, RoboSUST February 2020 – June 2021

- Organized a workshop on "Introduction to Fusion 360," collaborating with Autodesk during the COVID Pandemic, around 150 people participated the 3 days workshop got certified by Autodesk Fusion 360.
- Conducted a 5-week workshop on "Introduction to Robotics" with a team of 4 members.
- Guided 2 teams during the workshop to build their line following robots.

Technical Skills

Molecular Dynamics Simulations Tools: LAMMPS, Atomsk
Visualization Software: OVITO, Origin Lab
Programming: Python, MATLAB
CAD - CAE Software: SolidWorks, AutoCAD, Abaqus, ANSYS
Data Analysis: Excel, SPSS

Reference

Dr. Nuruzzaman Sakib
Assistant Professor,
Dept. of Mechanical Engineering,
SUST.
Email: nzsakib-mee@sust.edu

Nafiza Anjum
Assistant Professor,
Dept. of Mechanical Engineering,
SUST.
Email: nafizapro-mee@sust.edu

Md. Mahmudur – Or – Rashid
Assistant Professor,
Dept. of Mechanical Engineering,
SUST.
Email: mahmudorrashid@gmail.com