Showmic ISLAM Ph.D. Candidate in Mechanical Engineering & Applied Mechanics University of Nebraska-Lincoln, Lincoln, Nebraska | showmicislam.com | showmic@huskers.unl.edu

Objective

Seek to Integrate developed skills and knowledge of computational and numerical analysis towards the advancement of scientific research.

SOFTWARE SKILLS

Scientific Tools	DREAM.3D:Creating and analyzing 3D synthetic micro-structures
	MATLAB: Numerical analysis of wave propagation on synthetic
	microstructures, Calculation of wave speed & attenuation,
	Algorithm development for tracking inclusions, GUI development,
	Image Processing, Serial communication with micro-controller
	Ansys, Abaqus: 3D Static modeling
	Comsol: 2D heat convection analyses, Solution of Navier stokes equations
Programming Languages	Python:Automating workflow, Webscraping
	Bash: Automating workflow, C#: 2D Finite Element Analysis
Designing tools	Solidworks, Autodesk Inventor: 2D & 3D modeling
Others	Proficient in running computations in High performance Computing (HPC)
	and High Throughput Computing (HTC) environment
	Docker:Created DREAM.3D image to use on High Throughput Computing
	Latex, Microsoft Office Package: Journal & Article writing
Education	

2016- Present	Ph.D. in Mechanical Engineering and Applied Mechanics
	University of Nebraska-Lincoln, Nebraska
	Expected Graduation Date: August, 2021
	Dissertation Title: Ultrasonic scattering in complex polycrystalline materials
	Current GPA: 3.87/4.00
2015	B.Sc. in Mechanical Engineering
	Bangladesh University of Engineering & Technology (BUET), Dhaka
	CGPA: 3.44/4.00

WORK EXPERIENCE

- Graduate Research Assistant: (2017-present)- University of Nebraska-Lincoln
- Graduate Teaching Assistant: (2016-2017)- University of Nebraska-Lincoln-Took recitation classes and graded papers.
- Internship: 2014- ACI Pharmaceuticals Limited-Gathered knowledge about HVAC, Generators, Boilers, Water Purification System and overall working procedure of a pharmaceutical company.

CURRENT AND PREVIOUS RESEARCH

- Studying the ultrasonic responses of **two phase materials** created using **spark plasma sintering**. The study involves both **computational and experimental** part.
- Quantified the variation in ultrasonic wave speed and attenuation in different **tessellations and morphologies** of synthetic microstructures.
- Developed a GUI using MATLAB[®] to track inclusions across C-scans of multiple frequencies and estimate about the size and depth of the inclusion in different parts of railway bearings
- Studied the influence of **microstructural grain size distribution** on ultrasonic scattering and attenuation. The results are published in Ultrasonics Journal.
- Studied the effect of resolution in synthetic microstructures created using DREAM.3D on ultrasonic scattering and attenuation
- Finite Element Analysis-Studied the variation of maximum shear stress due to presence of an inclusion on a railway bearing assembly

- Investigated and quantified the **ultrasonic grain noise** and **signal to noise ratio** for an inclusion in parts of a railway bearing
- Designed and built a mining robot for NASA's Lunabotics Mining Competition, 2013 that could traverse the simulated lunar terrain, excavate regolith and deposit the regolith into a collector bin within 10 minutes. Responsible for mechanical design, CAD drawing, sourcing of parts and materials, and fabrication
- Developed a prototype of an automated fire extinguisher. The prototype was able to detect fire using **image processing** and extinguish it by spraying water on it
- Provided an engineering solution of incorporating wheelchair lifting system in public transports of Bangladesh. Worked as a team leader for the project. The design and stress analysis was done in **SolidWorks**

SUMMER WORKSHOPS

- Invited to attend **Open Science Grid Summer School Workshop** University of Wisconsin-Madison (Summer of 2019) The workshop focused on **High Throughput Computing**
- **3D Microstructure Studies Summer School** Carnegie Mellon University (Summer 2019) The seminar equipped the learner with skills regarding the creation and analysis of complex synthetic microstructures in DREAM.3D Software.

PUBLICATIONS

- 2020 Influence of Microstructural Grain-Size Distribution on Ultrasonic Scattering Ultrasonics, 2020 Mar 1;102:106032 | (2nd Author)
- 2020 Quantitative Ultrasonic Characterization of Subsurface Inclusions in Tapered Roller Bearings Bearing Steel Technologies: 12th Volume, Progress in Bearing Steel Metallurgical Testing and Quality

Bearing Steel Technologies: 12th Volume, Progress in Bearing Steel Metallurgical Testing and Quality Assurance, 2020 | (1^{st} Author)

2015 Effect of Richardson Number on Aiding Mixed Convection Inside A Lid-driven Differentially Heated Square Cavity

Proceedings of 7^{th} International Mechanical Engineering Conference and 16^{th} Annual Paper Meet, Paper No. HT-08, IEB, Dhaka, Bangladesh, January 02, 2015 | (1^{st} Author)

2015 Effect of Reynolds and Grashof Numbers on Mixed Convection Inside A Lid -driven Square Cavity Filled With Water- Al_2O_3 Nanofluid Proceedings of 11^{th} International Conference on Mechanical Engineering, ICME 2015 | (2nd Author)

AWARDS & EXTRA CURRICULAR ACTIVITIES

- 3rd in poster presentation at Supercomputing and Life Sciences symposium, 2019
- + 15^{th} out of 60 teams in NASA's Lunabotics Mining Competition, 2013
- 5th out of 80 teams in Engineering Students Association of Bangladesh (ESAB)'s Inter University Design Contest, 2013
- General Secretary of Bangladesh Students Association(BSA) in University of Nebraska-Lincoln

MAIN COURSES

Theory of Vibrations and Applications, Electron Microscopy of Materials, Engineering Acoustics, Advanced Mechanics of Materials, Continuum Mechanics, Analytical Methods in Engineering, Fundamentals of Finite Elements, Applied Physical Metallurgy

HOBBIES & INTERESTS

Landscape and Wildlife Photography, Badminton, Cricket, Soccer, Travelling