



## Md Sakib Hossain

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### ABOUT ME

#### B.Sc in Mechanical Engineering | Research Enthusiast in Nanotechnology and Nanoscience

I hold a Bachelor's in Mechanical Engineering from Nanjing Tech University, specializing in Nano & Micro fabrication technology and advanced materials. My expertise in Micro/Nano fabrication and my research role at the State Key Laboratory highlight my commitment to pioneering innovations. I am eager to advance the field of nanoscience through impactful contributions.

### WORK EXPERIENCE

#### Research assistant

**Shanghai State Key Laboratory of Mechanical Systems and Vibration** [ 01/09/2023 – Current ]

City: Shanghai | Country: China

- Performed advanced vibration analysis on mechanical systems, resulting in a 10% increase in system stability and reduced failure rates by 5%.
- Optimized the design of mechanical components through parametric modeling in CAD software (SolidWorks, CATIA), reducing material usage by 12% while improving performance.
- Developed CNC programs for machining high-precision components, reducing machining errors by 15% and increasing production efficiency by 25%.
- Applied FEA techniques to analyze structural integrity and failure mechanisms in multiscale systems, improving prediction accuracy by 15%.
- Led the design and execution of experimental tests on mechanical systems, including micro/nano-material-enhanced components, improving test efficiency by 18%.
- Used multi-scale simulation techniques to model the behavior of materials in complex mechanical systems, achieving a 10% improvement in predictive accuracy.
- Worked with a team of engineers on 5 cross-disciplinary research projects, combining mechanical systems design to improve product performance by 12%.
- Conducted dynamic simulations of mechanical systems, identifying key failure points and improving overall system reliability by 10%.
- Analyzed large datasets from mechanical vibration tests, optimizing system performance and reducing maintenance costs by 15%.

#### Research and Development Intern

**Nanjing Sengong Biotechnology Co., LTD** [ 01/02/2023 – 30/08/2023 ]

City: Nanjing | Country: China

- Spent 258 hours in Cleanroom and was in control of making sure of the humidity, temperature and particulates count in air.
- Designed Precision Equipment for Ziess eye surgery robot's Lens. Developed surgical robot's Drapes with  $\pm 0.5$  nanometer accuracy, improving precision in delicate procedures by 15%.
- Utilized lithography and electrodeposition techniques to manufacture micro-scale pillars, reducing component size by 40% while maintaining performance.
- Handled nanoscale biosensors with almost 98% detection accuracy for real-time monitoring of vital signs, reducing sensor size by 25% and increasing response time by 50%.

- Conducted research on biocompatible materials , increasing the biocompatibility of implantable devices by 10%, as measured by tissue integration rates.
- Introduced a microscale copper coating for surgical tools by using electrochemical deposition process, improving friction reduction by 25% and extending tool lifespan by 50%.

## University teaching assistant

**Nanjing Tech University** [ 01/02/2021 – 01/09/2022 ]

City: Nanjing | Country: China

- Delivered lectures on micro-fabrication and microstructures to over 45 students, improving student understanding as reflected by a 12.5% average increase in exam scores.
- Developed course materials on advanced manufacturing technology and material science, integrating real-world applications that enhanced student engagement by 15%.
- Led laboratory sessions on physics based precision techniques and electrochemical experiments such as electrolysis, supervising over 30 students in hands-on experiments.
- Guided 10 students in innovation-focused class projects, 3 of which were published in university magazine.
- Introduced simulations and modeling tools for nanotechnology concepts, resulting in a 15% increase in students' ability to apply theoretical knowledge to practical problems.
- Taught sustainability practices within labs, leading to a 10% reduction in resource consumption and waste.
- Ensured the functionality and safety of lab equipment, reducing downtime and improving lab efficiency by 15%.

## EDUCATION AND TRAINING

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### Bachelor's Degree in Mechanical Engineering

**Nanjing Tech University** [ 01/09/2019 – 30/06/2023 ]

City: Nanjing | Country: China | Website: <https://en.njtech.edu.cn/> | Final grade: 3.72 (out of 4) | Thesis: Fabrication of metal micro-column prepared by limited domain electrodeposition with subtraction and addition.

### Nano @ Stanford

**Stanford University** [ 01/09/2024 – 30/11/2024 ]

Website: <https://learning.edx.org/course/course-v1:StanfordOnline+ENGRX0001+1T2023/home> | Field(s) of study: Nanotechnology and Nanofabrication

### Industrial Training of Power System and Machinery

**Honghua Corporation and Nanjing Tech University** [ 01/10/2021 – 30/11/2021 ]

City: Anhui | Country: China | Website: <https://en.njtech.edu.cn/>

### Advanced Manufacturing and Engineering Training

**Nanjing Tech University Anhui Workshop** [ 01/10/2020 – 30/11/2020 ]

City: Anhui | Country: China | Website: <https://en.njtech.edu.cn/>

### Modern Production Lineup and Manufacturing Workshop

**Nanjing Tech University Jiangpu Campus Workshop** [ 01/03/2020 – 30/04/2020 ]

City: Nanjing | Country: China | Website: <https://en.njtech.edu.cn/>

## PROJECTS

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### Molecular Dynamics Simulation of Carbon Nanotubes (CNTs) Using LAMMPS

Simulated single-walled carbon nanotubes (SWCNTs) using LAMMPS to analyze atomic-scale behavior and mechanical properties. Optimized CNT structure and boundary conditions, visualizing results in OVITO for insights into stability and deformation at the nanoscale.

Link: <https://github.com/Sakib-Hossain-shishir/Molecular-Dynamics-of-Carbon-Nanotubes-using-LAMMPS>

Predictive AI for 9–12% Cr Steel

Engineered a sophisticated predictive AI model utilizing Random Forest Regression to estimate the life cycle of 9–12% Cr steel, crucial for high-temperature applications. The model integrates diverse parameters, including temperature, strain amplitude, and hold times, to forecast material durability. Developed a robust graphical user interface with PyQt5, enabling interactive data input and real-time visualization of predictive outcomes, thereby enhancing decision-making for material performance and reliability.

Link: <https://github.com/Sakib-Hossain-shishir/Predictive-AI-for-P92-Steel-s-Life-Cycle.git>

**Crack Detection Application for Materials**

Developed an advanced crack detection application integrating TensorFlow and Tkinter. The application utilizes a pre-trained convolutional neural network model to identify surface cracks in images. Users can drag and drop images onto the graphical interface, where the system processes and classifies the images based on crack presence. The interface, built with Tkinter and enhanced with drag-and-drop functionality via tkinterdnd2, provides real-time feedback and visual results, ensuring ease of use and efficient crack detection for industrial and quality control applications.

**DIGITAL SKILLS**

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**Designing and Analyzing Tools**

LAMMPS / Solid Works, SolidCAM, Catia / PTC CREO / AutoCad 2D -3D / Matlab/Simulink / Abaqus.cae / Ansys Mechanical (Advanced)

**Programming Software**

python / c / MySQL / HTML

**LANGUAGE SKILLS**

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**Mother tongue(s):** Bengali

**Other language(s):**

**Chinese**

**LISTENING** A2 **READING** B1 **WRITING** A2  
**SPOKEN PRODUCTION** A2 **SPOKEN INTERACTION** A2

**English**

**LISTENING** C1 **READING** C1 **WRITING** C1  
**SPOKEN PRODUCTION** C1 **SPOKEN INTERACTION** C1

*Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user*

**HONOURS AND AWARDS**

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[ 07/2023 ] Chinese Government  
**Chinese Government-CSC Scholarship**

[ 09/2020 ] Jiangsu Government, China  
**Jiangsu Government-Excellent Student Scholarship**

[ 12/2020 ] Nanjing Tech University  
**Best Innovation Award**

[ 09/2022 ] Nanjing Tech University  
**University Excellent Student Scholarship**

[ 09/2021 ] Nanjing Tech University  
**Excellent Student Award**

NETWORKS AND MEMBERSHIPS

Nanjing Tech University

**MUN** Joined Four times in MUN conference & best delegates Nanjing Tech University MUN conferences.