

# Lakshita Mohanty

Department of Mechanical Engineering

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## Academic Qualifications

| Year           | Degree/Certificate | Institute                             | CPI/%    |
|----------------|--------------------|---------------------------------------|----------|
| 2019 - Present | B.Tech             | Indian Institute of Technology Kanpur | 7.0/10.0 |
| 2019           | Class XII (CBSE)   | MM Public School Pitampura, Delhi     | 93.8%    |
| 2017           | Class X (CBSE)     | SD Vidya Mandir, Panipat              | 10/10    |

## Scholastic Achievements

- Cleared **Phase I** testing and qualified for **Microsoft's Engagement & Mentorship Program – Engage 2021**
- Secured **All India Rank 27** in National Race of Amazon's **AWS DeepRacer Women's League 2021**
- **Vapi City Topper** in **13th National Science Olympiad 2011** with a score of **99.73 %** and **All India Rank 145**

## Key Projects

### Modeling Subsurface Mine Detonation | Research Project - SURGE 2021

May'21 - Present

Mentor: **Professor Ishan Sharma**, *Dep. of Mechanical Engineering* | **Students-Undergraduate Research Graduate Excellence Program**

|                 |  |
|-----------------|--|
| <b>Aim</b>      | • Modeling a <b>flail system</b> to <b>trigger</b> and <b>detonate</b> mines wherever buried   |
| <b>Tasks</b>    | • Analyzing the <b>transfer of stresses</b> from the <b>point of impact of the flail</b> to the location of the <b>buried mine</b><br>• Performing <b>simulations</b> using <b>LAMMPS</b> and <b>OVITO</b> to study how <b>waves travel through discrete media</b> like soils<br>• To simulate a <b>granular bed</b> , <b>impact</b> it with a <b>flail</b> & analyse the <b>stress transfer</b> through the bed |
| <b>Progress</b> | • Conducted <b>Literature Review</b> on design of flails and force transmission below the surface of soil<br>• <b>Constructed</b> a <b>granular bed</b> of <b>5000 atoms</b> using <b>LAMMPS</b> input script, <b>simulated settling of atoms</b> under the effect of <b>gravity</b> and currently assessing the <b>Total Kinetic Energy Analysis</b> of the <b>system of atoms</b>                              |

### 3D Shape Completion for Autonomous Vehicles | Robotics Club IITK

May'21 - Present

- **Aim:** Building a model which **predicts the shape of objects**, detected through **LiDAR data** and **RGB images**
- Implemented **semantic segmentation** for **KITTI semantic dataset** using **UNET architecture** to mask cars only
- Achieved a final **precision of 0.9407** on **training** and **0.9429** on **validation** after **training the UNET model** for **25 epochs**
- Currently doing **Literature Review** on **Deep Generative Modeling** and implementation of **Variational Autoencoders (VAEs)**

### Mechanical Watch Model (Course Project) | Professor Nachiketa Tiwari, Dep. of Mechanical Engineering

Jan'21 - May'21

- Designed an artistic working model of the **ETA 6497-1 Manual Wind Watch** in a team of **14 members**
- Analyzed the **working of a mechanical watch** and various mechanisms involved for **energy transmissions**
- Implemented **Fusion 360** to model the operative watch and added **extra functionalities** for displaying the **day** and **date** as well

## Work Experience

### Sybylline Robotics Private Limited IC IITP | Summer Intern

May'21 - Present

- Comprehended various basics of **ROS2** (Robot Operating System 2), **Client Libraries** and **URDF** (Unified Robot Description Format)
- Brainstormed on **simulations** in **Gazebo**, **Rviz** using **Nav2** library to perform navigation related actions
- Currently working on **simulations** and **navigation** analysis of **floor disinfecting** and **medical delivery robot** using **Gazebo** and **Rviz**

### UnchaAI | JEE Mentor

Sep'20 - Oct'20

- Tutored in UnchaAI, a **tech-ed startup** by **IITK** and **NITP** alumni, which provides a **mentorship platform** to **JEE aspirants**
- Mentored JEE aspirants with their **PCM** doubts, designed a **customized time table & metric** to track their performance **periodically**

## Position of Responsibility

### Manager Research Wing | Academics and Career Council IITK

Apr'21 - Present

|                   |  |
|-------------------|--|
| <b>Leadership</b> | • Led a team of <b>12 secretaries</b> working towards promoting research culture amongst the students<br>• <b>Guided the team</b> to work as a unit aimed at assisting the <b>Research Community</b> in fulfilling it's needs                                |
| <b>Initiative</b> | • Introduced <b>Student Spotlight</b> to create more awareness about <b>remote research</b> amidst the <b>global pandemic</b><br>• Guided a team of <b>3 secretaries</b> to edit blogs for Student Spotlight on <b>Research Wing's</b> website               |
| <b>Impact</b>     | • Conducted sessions targeted for <b>UG community</b> to increase interaction with <b>alumni</b> in <b>research community</b><br>• Successfully hosted <b>InVar sessions</b> (Industry vs Research) to help students <b>explore various career prospects</b> |

## Relevant Coursework

|                                 |  |                              |
|---------------------------------|--|------------------------------|
| Data Structures and Algorithms  | Real Analysis and Multivariable Calculus | Linear Algebra & Ordinary DE |
| Fundamentals of Programming     | Introduction to Economics                | Manufacturing Processes      |
| Engineering Graphics and Design | Introduction to Electrical Engineering   | Fluid Dynamics               |
| Thermodynamics                  | Nature & Properties of Materials         | Dynamics                     |

## Technical Skills

- **Languages/Libraries:** C, C++, JavaScript, Python, Java, Tensorflow, Keras, Numpy, Matplotlib, Pandas, OpenCV, Scipy, Seaborn
- **Software & Robotics:** Fusion 360, MATLAB, AutoCAD, LAMMPS, OVITO, ROS2, Gazebo, Rviz, Nav2
- **Utilities and Tools:** Git, GitHub, L<sup>A</sup>T<sub>E</sub>X, VS Code

## Extra-Curricular Activities

### Volunteer, Raktarpan IITK (Blood Donation Awareness Club)

May'20 - Mar'21

- Volunteered in spreading awareness and busting misconceptions regarding **Blood Donation** and related topics
- Collaborated with **Fine Arts Club, IITK** and **organized an art competition** to promote Blood Donation
- Assisted the **Senior Executive** in activities pertaining to **Public Relations** in **Udghosh'19**, the annual sports fest of IITK
- Maintained an art-blog of **digital art illustrations** made on **Procreate**; collaborated with **Music Club IITK** to create artistic covers
- Ranked among the **Top 16 players** in **IITK Scrabble League**; participated in **Inter IIT Scrabble League 2020**
- Assisted the **Photography Club** and **Film Club** in **Galaxy'20**, the inter hall Cultural Championship

Feb'20