

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

- Secured **All India Rank 6033** in **JEE Advanced 2019** among the 2.45 Lakh shortlisted candidates
- Secured **All India Rank 21999** in **JEE Mains 2019** among the 11.47 Lakh shortlisted candidates
- **Vapi City Topper** in **13th National Science Olympiad 2011** with a score of **99.73 %** and **All India Rank 145**
- 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**

Key Projects & Workshops

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*

Aim	<ul style="list-style-type: none"> • Modeling a flail system to trigger and detonate mines wherever buried
Tasks	<ul style="list-style-type: none"> • Analyzing the transfer of stresses from the point of impact of the flail to the location of the buried mine • Performing simulations using LAMMPS and OVITO to study how waves travel through discrete media like soils • To simulate a granular bed, impact it with a flail & analyse the stress transfer through the bed
Progress	<ul style="list-style-type: none"> • Conducted Literature Review on design of flails and force transmission below the surface of soil • Constructed a granular bed of 5000 atoms using LAMMPS input script, simulated settling of atoms under the effect of gravity and currently assessing the Total Kinetic Energy Analysis of the system of atoms

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)**

Microsoft Teams Clone Application | Microsoft Engage Mentee 2021

Jun'21 - Present

- Implemented a **video call application** with **WebRTC API** using **Scaledrone** as the signaling server
- Incorporated **RTCPeerConnection** instance to establish **WebRTC connection** between local computer and a remote peer

Facial Expression Recognition using ML | Brain and Cognitive Society IITK

May'20 - July'20

- Replicated a paper on CNN study **FER** with **Convolutional Neural Network** via a **new face cropping & rotation strategy**
- Employed **data augmentation**, **image cropping** and **CNN** while working in a team of **9 members**
- Achieved a final accuracy of **93.46%** and **90.54%** on **JAFFE** and **CK+** **dataset** respectively for 7 classes
- Conducted **Literature Review** on the current methods of Facial Expression Recognition

BCS Workshop | Brain and Cognitive Society IITK

April'20

- Learnt **Basic Python**, **Machine Learning**, **Computational Modelling** and **Psychophysics**
- Designed a psychophysics experiment based on **The Role of Categorization in Visual Search for Orientation** using **PsyToolkit**
- Achieved a final accuracy of **93.46%** and **90.54%** on **JAFFE** and **CK+** **dataset** respectively for 7 classes
- Conducted experiment on 7 participants and analysed the data using **Numpy**, **Pandas** & **Matplotlib**

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**

UnchAI | JEE Mentor

Sep'20 - Oct'20

- Tutored in UnchAI, 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**

Self Projects

MNIST Digit Recognizer | Kaggle Submission

May'21

- Implemented a **Convolutional Neural Network** with **dropout** and **batch-normalization** layers
- Analyzed the performance of the **classification model** by plotting **Confusion Matrix**
- Examined the **predicted versus true** labels for the **top 16** wrong predictions
- Achieved a final accuracy of **99.08%** upon submission on kaggle

Positions of Responsibility

Manager Research Wing | Academics and Career Council IITK

April'21 - Present

Leadership	<ul style="list-style-type: none">Led a team of 12 secretaries working towards promoting research culture amongst the studentsGuided the team to work as a unit aimed at assisting the Research Community in fulfilling it's needs
Initiative	<ul style="list-style-type: none">Introduced Student Spotlight to create more awareness about remote research amidst the global pandemicGuided a team of 3 secretaries to edit blogs for Student Spotlight on Research Wing's website
Impact	<ul style="list-style-type: none">Conducted sessions targeted for UG community to increase interaction with alumni in research communitySuccessfully hosted InVar sessions (Industry vs Research) to help students explore various career prospects

Secretary Research Wing | Academics and Career Council IITK

April'20 - March'21

- Approached **15+ startups** for **internship positions** in the field of **E-vehicle R&D** to help students get internship during lockdown
- Interacted with **IITK alumni** and documented their **research experience** in the form of **AnC Blogs**

Student Guide | Counselling Service IITK

Oct'20 - Present

- Provided **guidance and emotional support** to a group of **six freshers** by helping them adjust to college life
- Helped in organizing **Orientation (Y20)** for **1000+** freshers

Academic Mentor MTH101/102 | Counselling Service IITK

Sep'20 - Present

- Mentored students** who have faced difficulty in their freshman year **mathematics courses**
- Taken academic classes and **hall-level doubt clearing sessions** for first years

Secretary | Brain and Cognitive Society IITK

Aug'20 - March'21

- Hosted various **Journal Club Talk** events by researchers and PhD students on **NLP, cognitive studies** and **ML**
- Managed the **LinkedIn page** of the society as a part of the **Web Reach team**

Secretary | Quiz Club IITK

July'20 - March'21

- Organized and conducted **themed quizzes** for campus community

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

- Programming Languages:** C, C++, JavaScript, Python, Java
- Libraries:** Tensorflow, Keras, Numpy, Matplotlib, Pandas, OpenCV, Scipy, Seaborn
- Software:** Fusion 360, MATLAB, AutoCAD, LAMMPS, OVITO
- Robotics:** ROS2, Gazebo, Rviz, Nav2
- Utilities and Tools:** Git, GitHub, L^AT_EX, VS Code

Extra-Curricular Activities

- Volunteer, Raktarpan IITK**

May'20 - March'21

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