Vaibhav Pratap Singh

3rd Year Undergraduate
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Academic Qualifications

Year	Degree/Certificate	Institute	CPI/%
2016 - Present	B.Tech.	Indian Institute of Technology, Kanpur	7.8/10
2015	CBSE (XII)	DAV Public School, Kota	93.6%
2013	CBSE (X)	Modern School, Kota	10/10

Scholastic Achievements

- Ranked amongst the **National Top 1%** (amongst 1,500,000 candidates) in **Joint Entrance Exam ADVANCED 2016**
- Ranked amongst the **National Top 0.1%** (amongst 15,000,000 candidates) in **Joint Entrance Exam MAINS 2016**

Key Projects Undertaken

- **BAJA - All Terrain Vehicle : IITK Motorsports**
  Faculty Advisor - Dr. Santanu De, Assistant Professor, IIT Kanpur (worth INR 15 lakhs) (*Mar'18-Present*)
  - Formulating Brakes and Vehicle dynamics subsystem for BAJA (B'19) to feature in Enduro Student India 2019
  - Optimized vehicle's braking parameters for panic braking conditions of 60 kmph to 0 kmph in just 2.5 secs
  - Studied concepts of vehicle dynamics and tire behavior under braking conditions to determine brake force distribution
  - Analyzed structural integrity of disc brake rotors under mechanical & thermal loads using FEM, following design changes
  - Revamped brake pedal assembly to minimize deformation as per driver ergonomics
  - Upgraded the wheel assembly to incorporate design changes in suspension geometry of the vehicle
- **Formula Student Vehicle : IITK Motorsports**
  Faculty Advisor - Dr. Santanu De, Assistant Professor, IIT Kanpur (worth INR 30 lakhs) (*May'17-Jan'18*)
  - Devised brake subsystem for Formula student vehicle (F'18) which participated in Formula Bharat 2018
  - Developed the mathematical model of a reliable and efficient braking system for the vehicle
  - Reconstructed brake actuation assembly to provide efficient braking and pedal response, manufactured in-house
  - Reorganised hydraulic systems to increase driver ergonomics and provide better serviceability to the whole vehicle
  - Designed rotor and brake pedal assemblies to operate under varying loads for an elongated period of time
  - Solved a case study on appropriate mass manufacturing process and capital outlay at Formula Bharat 2018 for a Business Logic Presentation event, bagging 6th position among 71 national teams
- **Image Processing of Thermal Images**
  Project Investigator - Dr. Braj Bhushan, Professor, IIT Kanpur (*Mar'18-Jul'18*)
  - Administered in-built image processing toolbox, Matlab to detect thermal signatures in a human face image data
  - Employed normalized 2-D cross-correlation to detect various feature points of a human face
  - Extracted, compiled and analyzed user temperature data to generate statistical reports
- **Multipurpose Machine**
  Instructor - Dr. J. Ram Kumar, Professor, IIT Kanpur (TA202, Machining Processes) (*Aug'17-Nov'17*)
  - Awarded as the Best Project of the course in the semester 2017-18
  - Led a 6 member team to build a Multipurpose Machine model capable of performing various mechanical tasks such as grinding, slashing, drilling and cutting simultaneously
  - Acquired hands on experience on conventional machining techniques like turning, milling, drilling and boring.
  - Examined industrial implementation of machinery, including its cost analysis
- **Drain Cleaner**
  Instructor - Dr. Vivek Verma, Associate Professor, IIT Kanpur (TA201, Manufacturing Processes) (*Jan'18-Mar'18*)
  - Led a team of five to build a model of drain cleaner
  - Received hands on experience on processes like casting, sheet metal forming, welding, brazing and forging.
  - Examined industrial implementation of machinery, including its cost analysis
- **Role of emotions in suppressing task irrelevant distractions**
  Instructor - Dr. Devpriya Kumar, Professor, IIT Kanpur (PSY152, Applications of Psychology) (*May'17-July'17*)
  - Performed psychological experiments on 3 groups (without any gender bias) positive, negative and neutral emotional cues were induced as input to each individual in the group
  - Performance in task requiring sound attention (here visual task: spotting differences in 2 pictures) with task irrelevant distractors (audio clips) were used to compare groups (neutral groups performance was taken as base)
  - The group with negative mood nudge was found to perform worse in comparison to positive mood nudge group

Technical Skills

- **Programming Tools :** C, C++, Octave, MatLab 2018a and Simulink, HTML, CSS, LaTeX
- **CAD/CAE Tools :** SolidWorks 16.0, Ansys 16.0, ABAQUS, Altair HyperWorks, Autodesk Inventor 16.0, MSC Adams
- **Other Softwares :** MS Office, Adobe Photoshop, Adobe Aftereffects

Relevant Courses Undertaken

Advance Mechanics of Solids	Heat and Mass Transfer	Finite Element Analysis
Mechanics of Solids	Energy Systems	Manufacturing Science and Technology
Introduction to Mechanics	Thermodynamics	Engineering Design and Graphics
Vibration and Control	Power Electronics	Applied Probability and Statistics
Design of Machine elements	Introduction to Electrical Engineering	Partial Differential Equations
Dynamics	Introduction to Electronics	Linear Algebra and Calculus

Positions of Responsibility

- **President : Society of Automotive Engineers, IIT Kanpur** (*Mar'18-Present*)
  - Spearheading a 3 tier team, consisting of 40+ members; orchestrating various logistics and technical requirements
  - Formulating strategic marketing campaigns to gather funds via multiple sources; targeting a budget of INR 3 million
  - Engaging in 3 national and 1 institute level competitions and workshops via unique brand strategies
  - Coordinating and channelizing appropriate amount of funds among five subsystem profiles
- **Student Guide : Counselling Service** (*Jul'17-Mar'18*)
  - Guided and mentored 5 freshmen in acclimatizing to the environment and academic structure of the institute
  - Coordinated with the Counselling Service and organized Orientation Programme for 800+ freshmen
  - Helped the freshers with academics through regular meetings and maintained a good rapport with them

Extracurriculars

- Formula Bharat'18
  - Participated in Formula Bharat18 as a part of team IITK Motorsports securing overall 15th position among 71 teams
  - Participated and secured 6th position in a Business logic presentation event
  - Participated and secured 9th position in the Design event
- Secured 2nd position in Design-O-Flare competition, Takneek 2017
- Helped in successfully organizing Dance Events in Antaragni 2017, as Dance Competitions Secretary
- Secured 1st position in intra-hall dance-drama event, Galaxy 2017
- Secured 3rd position in intra-hostel group dance competition, Galaxy 2017
- Participated in Robobasket, an IMU-based robot making competition in Takneek 2016