Vaibhav Jaiswal | **18310R002**
Mechanical Engineering | **M.Tech.**
Indian Institute of Technology, Bombay | **Gender: Male**
Specialization: Thermal and Fluids Engineering | **DOB: 17-04-1996**

Examination	University	Institute	Year	CPI / %
Post Graduation	IIT Bombay	IIT Bombay	2021	9.19
Graduation	CSVTU, Bhilai	Bhilai Institute of Technology, Durg	2017	8.81
Graduation Specialization: Mechanical Engineering				
Intermediate	CBSE	Sri Chaitanya Techno School	2013	91.20%
Matriculation	CBSE	Kalyanika Kendriya Shiksha Niketan	2011	9.8

SCHOLASTIC ACHIEVEMENTS

- Submitted conference paper for **FMFP** titled "Paper-based Microfluidic Pump for Point-of-Care Applications" *(2020)*
- Secured **99.21** percentile among **1.9 lakhs** candidates in **GATE-ME 2018** *(2018)*
- Ranked **86** in Chhattisgarh State Pre-Engineering Test **(C.G.P.E.T.-2013)** *(2013)*

KEY PROJECTS AND SEMINAR

- **Paper-based passive microfluidic pump for point -of-care applications**
  *(M.Tech. Project, Advisor: **Prof. Prasanna Gandhi**)* *(Jan'20-Present)*

Motivation	• Spontaneous **transport** of fluid from tiny **pores** and channels because of dominant **capillary** forces
Work Completed	• Theoretically **predicted** volumetric **flow** through pump using reported **mathematical models** • **Simulated flow** from the individual **components** (capillary tube and filter-paper) of the capillary pump using **COMSOL** Multiphysics and obtained **pressure** and **velocity** field in the flow domain • Reduced noise in the recorded signal and **improved** experimental repeatability by **setup modification** • Experimentally **investigated** flow rate from test **prototype** for a few channel and paper dimension
Future Work	• Flow **simulation** to predict the volumetric flow and discover key **parameters** affecting the flow • Integration of multiple flow channels on one chip to obtain multiple flow rate and sequential flow
Outcome	• Developed prototype will be able to deliver near **constant flow** rate **without electricity**

- **Study of fluid flow through porous media**
  *(M.Tech. Seminar, Advisor: **Prof. Prasanna Gandhi**)* *(Jul'19-Nov'19)*
  - **Reviewed** the concepts of **capillary flow**, and **paper-fluidics** for various geometrical arrangements of paper
  - Explored the possibility of **model integration** which can be suited for **development** of microfluidic chip
- **Design analysis and modification of elliptical leaf spring** (Team of 4)
  *(BE Project, Advisor: **Prof. Manoj Kr. Pal, Bhilai Institute of Technology, Durg**)* *(Jan'17-May'17)*
  - **Modelled** elliptical leaf spring in **Creo** parametric and performed **static analysis** using **Ansys** Mechanical
  - **Explored** the possibility of two shape **modification** in place of rectangular **cross-section** of the elliptical spring
  - Obtained reduced equivalent stress in trapezoidal shape and increased equivalent stress in parabolic shape, as compared to conventional spring, thus found **trapezoidal** shape a **preferred modification** to conventional spring

TECHNICAL SKILLS

- **Software Packages:** Ansys, COMSOL, Simulink
- **Programming Language:** C, C++, MATLAB, Python
- **Python Libraries:** NumPy, pandas, scikit-learn, Matplotlib
- **Other Tools:** LaTeX, MS Office

RESEARCH AND INDUSTRIAL EXPERIENCE

- **Research Assistant**
  *(Suman Mashuwala Advanced Micro-engineering Lab, IITB, Advisor: **Prof. Prasanna Gandhi**)* *(July'18-Present)*
  - **Involved** in research work with **10+** multidisciplinary scholars on project under the **IMPRINT India** initiative
  - Working on pump-less fluid pumping device with Achira Labs, Bangaluru; to be integrated into their product
- **Design and failure analysis of pattern stripper mechanism** (Team of 5)
  *(Bhilai Steel Plant (SAIL), Bhilai CG, Guide: **Mr. K. K. Thakur**)* (June'16)
  - Underwent 4 week project based training to design and carry out failure analysis of pattern stripper
  - **Modelled** a pattern stripper to separate pattern from core without damaging core and mould cavity
  - Achieved a factor of safety of **5.34** for the pattern stripper mechanism which is up to the industrial standard

COURSE PROJECTS

- **Study of thermal boundary layer (TBL) interaction between two vertical surfaces using interferometry** (Team of 2)
  (*Optical Methods in Mechanical Engineering, Instructor:* ***Prof. Atul Shrivastava****)* *(July'19-Nov'19)*
  - **Developed** vertical parallel plate **test setup** with adjustable gap and heating arrangement to study **TBL interaction**
  - **Captured** the development of TBL from initial transient to study state using **Mach-Zehnder interferometer**
  - Qualitatively determined the effect of boundary layer interaction on **local heat transfer coefficient**
  - Analysed **interferogram** to determine **entrance length** and boundary layer thickness between heated plates
- **Controller design for solar array actuation system used for on-board power generation in satellite**
  (*System Modelling, Dynamics and Control (Audit), Instructor:* ***Prof. Ashok Joshi****)* *(July'19-Nov'19)*
  - Designed a **PD controller** with **root locus** method and tracked **ramp input** (**2%** error criteria) using **Simulink**
  - Achieved **settling time** of **150** seconds with **13%** peak **overshoot** as a system **response** for the compensated system
- **Regression and classification of steam table dataset using classical machine learning algorithms** (Team of 4)
  (Engineering Data Mining and Applications, Instructor: ***Prof. Vinay Kulkarni****)* *(July'19-Nov'19)*
  - Fit **regression** and **classification** models on steam dataset to **predict** the enthalpy and state of water respectively
  - **Decision tree** regressor and classifier **outperformed** other regression (**OLS, Lasso, Ridge**) and classification models (**Artificial neural network, Support vector machine**) in terms of **model predictability**
  - Used **grid search** method to find **optimum hyperparameters** for classification models
- **Development and validation of Navier-Stokes code**
  (*Computational Fluid Dynamics and Heat Transfer, Instructor:* ***Prof. Atul Sharma****)* *(Jan'19-Apr'19)*
  - Developed **finite volume method** based semi-explicit code with **staggered grid** in **Scilab**
  - Velocity and pressure distribution is found to be in good agreement with the available literature

COURSE UNDERTAKEN *(*Audit)*

- Thermal Design of Electronic Equipment
- Optical Methods in Mech. Engineering
- Advanced Heat Transfer
- Data mining and Application
- Computational Fluid Dynamics
- System Dynamics and Control*

POSITIONS OF RESPONSIBILITY

- **Department Placement Coordinator | Placement Cell | IIT Bombay** *(July'20-Present)*
  - Formulated an efficient **architecture** to train **70+** students on by **ideating** group discussions, personal interviews
  - **Formulated** tests on various platforms, **evaluated** and catered students' needs and issues regularly
  - **Scrutinized** the resumes of **1000+** students across 23 departments in coordination with **50+ DPCs**
  - Acted as a point of contact between students and placement cell for smooth two-way information exchange
- **Interview Coordinator | Placement Cell | IIT Bombay** *(Dec'18)*
  - **Coordinated** with the team of **250+** members for interview of **1600+** students
  - **Assisted** in conducting Pre-Placement talks and Tests for **15+** firms
- **Floor Representative | Maintenance Council | H-16** *(Nov'18-June'19)*
  - **Resolved** maintenance **issues** of **36** students with concerned authorities, took regular follow up

EXTRACURRICULAR ACTIVITIES

Technical	• Enrolled to an online course **"Algorithmic Toolbox"** by University of California on Coursera	*(Ongoing)*
	• **Exhibited** IMPRINT project to **1000+** visitors in TechConnect at **TechFest**, IITB (Team of 8)	*(2019)*
	• **Organised** Robo-race and water-bottle rocket **competition** in college fest with a team of **4**	*(2016)*
	• Participated in **robo-soccer competion** in a team of **4**	*(2015)*
Award	• Awarded **1st** prize in **Group Dance** Competition in **PG-Cult phase-2**	*(2019)*
Hobbies	• Playing volleyball, carrom, swimming and dancing	

Scholastic achievements and extracurricular activities are not verified by the Placement Cell