Suhani Kolhatkar

Undergrad Mechanical Engineering Student at COEP Tech University
Co-founder at ValidusEduTech | Data Science Student at IIT Madras
Former Research Intern at Drones and Autonomous Systems Labs , UNLV

📞 +91 9822959007   ✉️ suhanikolhatkar2005@gmail.com   📍 Pune, India
🔗 https://github.com/SuhaniKolhatkar   🔗 https://www.linkedin.com/in/suhani-kolhatkar/

Profile

Mechanical Engineering student with a foundation in data science and knowledge engineering. I work on projects involving design automation, machining simulation, and CAD-CAE integration using tools like FreeCAD and Ansys. As the co-founder of ValidusEduTech, I lead student-driven initiatives focused on technical learning and community collaboration. I enjoy learning and working on technical projects. At the same time, I find joy in creative and calming pursuits like Kathak, where I've completed my Visharad, and gardening, which keeps me connected to nature. These passions reflect who I am—a mix of curiosity, creativity, and a love for learning new things.

Work Experience

ValidusEduTech
📅 June 2023 - Present, 📍 Pune , Maharashtra

Co-Founder and Community Director

- BuildinBuilding profiles of students through Students' Katta:
  - Organized and curated events for students on topics beyond academics. Led 12 Students' Katta events, responsible for deciding session agendas and managing prerequisites to ensure smooth event operations.
  - Developed strong managerial skills by effectively leading a team and coordinating their efforts toward common objectives.
  - Demonstrated communication and oratory skills through delivering presentations, facilitating discussions, and engaging with community members.
  - Demonstrated financial management skills by overseeing budget allocation and expenditure for community events.
  - Expanded personal and professional networks through active engagement with community members, guest speakers, and industry professionals.
- Building profiles of students through Sunday Side Projects:
  - An initiative under ValidusEduTech, where I led a cohort of students for a web development project.
  - Led a project based on Exploratory Data Analysis, where we studied the learning patterns of students taking classes at ValidusEduTech.

Drones and Autonomous Systems Lab, UNLV
📅 July 2024 - Sep 2024, 📍 LV, Nevada, US

Research Intern

- Worked on Cable Driven Parallel Robots (CDPR) :
  - Designed and implemented a Cable-Driven Parallel Robot (CDPR) system, incorporating Dynamixel AX12 motors, Raspberry Pi 4B controller, and INA260 power sensors for precise motion control
  - Developed control algorithms using ROS (Robot Operating System) and Python, implementing kinematic calculations and static analysis for accurate end-effector positioning
  - Engineered a mechanical projectile launcher with optimized spring configurations (k=11200 N/m), including dynamic analysis and force calculations for precise trajectory control
  - Created data visualization interfaces for path tracking using SciLab
- Controlling and flying drones
- Operating Laser cutting machine , 3D printer, CNC milling machine.
- Designed and Curated License Plate Cover in acrylic using laser cutting

Arcticturn Foundation
📅 May 2024 - June 2024, 📍 Pune, India

Intern

- Worked on understanding and analyzing the United Nations Sustainable Development Goals (SDGs) with a focus on SDG 9: Industry, Innovation, and Infrastructure.
- Contributed to mapping local industries and startup activities to relevant SDGs by identifying thematic overlaps and sustainability impact areas

Validus Analytics LLP
📅 June 2023 - July 2023, 📍 Pune , Maharashtra

Intern

- Acquired foundational knowledge in machine learning theory during internship tenure. Familiarized myself with ml5.js for machine learning implementation and explored image classification techniques using ml5.js and p5.js, incorporating pre-trained models like MobileNet.
- Gained practical experience with essential Python libraries including NumPy, Matplotlib, Plotly, and Pandas, enabling data analysis, visualization, and manipulation tasks.
- Introduced to Streamlit for building interactive web applications and explored its functionalities.
- Gained exposure to Document Object Model (DOM) and utilized GoJS to create a raw interface for data visualization purposes.
- Initiated learning of jQuery for front-end development, expanding my skills in web development technologies.

Education

BTech Mechanical Engineering
COEP Technological University
📅 2023 - Present
- GPA : 8.9

BS Degree Data Science
Indian Institute of Technology Madras
📅 2023 - Present
- GPA : 7.5

Secondary Education
Garware college of science
📅 2021 - 2023
- 98.798 Percentile

Primary Education
Abhinav Vidyalaya
📅 2011 - 2021
- 99.2 %
- Best Student Award

Technical Skills

CAD, CAM & Simulation Tools:
- FreeCAD(Python Console, CAM Workbench, Macros ,),
- Fusion 360
- AutoCAD
- Ansys (Static Structural)
- OrcaSlicer
- Inkscape
- SciLab / MATLAB

Programming Languages & Libraries:
- Python (numpy, pandas, plotly, owlready2),
- C++ (basic-level)
- HTML, CSS
- JavaScript
- ROS
- React (basic-level)

Ontology & Semantic Tools:
- Protégé,
- OWL,
- SWRL,
- SPARQL,
- owlready2
- Basic familiarity: Neo4j, GraphDB

Web & Interactive Tools:
- Streamlit (basic-level)
- Dash (basic-level)

Version Control & Collaboration:
- GitHub (basic-level)

Projects

Accelerating Custom CAD Variants with Semantic Knowledge Engineering
📅 May 2025 - Present 📍 Pune , Maharashtra

- Designing a semantic framework to automate the generation of CAD variants by linking geometric features with domain-specific knowledge using OWL ontologies.
- Integrating FreeCAD, owlready2, and SWRL rules to create parametric 3D models that adapt based on rule-based reasoning and structured data inputs.
- Implementing a closed-loop pipeline where ontology-driven design updates trigger geometry regeneration and FEA validation via Ansys.
- Focused on reducing manual intervention in iterative design changes by mapping constraints, dependencies, and configurations into a knowledge-driven system.

Knowledge Driven Advisory for Machining complex engineering components
📅 May 2025 - Present 📍 Pune , Maharashtra

- Studied Kendall's cutting force theory in depth and implemented the model in Python to explore how process parameters like rake angle, depth of cut, feed rate, and cutting speed influence cutting forces.
- Designing structured flowcharts to organize the simulation workflow, from input collection to force computation and result visualization.
- Working with FreeCAD's CAM Workbench to simulate machining operations such as profiling and pocketing, with manual toolpath definition for fine control.
- Aiming to analyze the effects of varying process parameters on cutting performance, with the final goal of minimizing tool wear, improving surface finish, and reducing cycle time.

Exploratory Data Analysis on Student's Learning Patterns
📅 Dec 2024 - Jan 2025 📍 Pune , Maharashtra

- Conducted an exploratory analysis of internal data collected from students enrolled in ValidusEduTech programs to identify learning behavior and engagement patterns.
- Used pandas, NumPy, and seaborn in Python to clean, preprocess, and analyze student activity logs such as attendance, test scores, and session interactions.
- Generated interactive visualizations using Plotly to identify trends, outliers, and correlations among variables like topic interest, attendance frequency, and performance.
- Interpreted data insights to support academic decision-making within the organization and guide potential interventions for student support and course planning.
- Built Static plots to summarize findings and communicate results clearly to non-technical stakeholders..

Cable Driven Parallel Robot (CDPR) with unknown Anchor Points
📅 July 2024 - Sep 2024 📍 Las Vegas , US

- Designed and Assembled a CDPR prototype using Dynamixel AX12 motors, INA260 current sensors, and Raspberry Pi 4B, controlled via joystick input.
- Modeled basic system kinematics to compute cable lengths and end-effector position, and implemented inverse kinematic equations for square trajectory movement.
- Performed static analysis to calculate cable tensions using vector-based force equilibrium and matrix representation methods.
- Used motor torque-current relationships and Dynamixel motor specs to evaluate the load response.
- Designed and executed a working prototype of a spring-actuated projectile launcher, with stiffness constants derived from theoretical and measured values.
- Integrated hardware and Python-based ROS node control logic to achieve coordinated motor actuation and motion.
- Mapped anchor points and dynamic cable lengths (L1, L2).
- Generated a heat map to indicate tension hotspots.

Eigenvalue Calculator using vanilla JS
📅 Jun 2023 - July 2023 📍 Pune , Maharashtra

- I developed a JavaScript program capable of calculating eigenvalues and the characteristic equation for a given 2×2 matrix.
- Integrating mathematical principles with coding expertise, I transformed the concept into functional code.
- Designed a user-friendly interface allowing users to input the matrix entries; upon confirmation, the program promptly outputs the eigenvalues and characteristic equation, demonstrating the intersection of my mathematical acumen and programming skills.

Website development from scratch
📅 May 2023 - Jun 2023 📍 Pune , Maharashtra

- Created ValidusEduTech, a website from scratch using HTML, CSS, and JavaScript.
- Utilized GitHub repositories to store website pages, facilitating seamless updates and version control.
- Hosted the website using a domain name acquired from GoDaddy, ensuring accessibility and professional branding.
- Utilized JavaScript to write code that not only animated the particles but also applied principles from collision theory, demonstrating my proficiency in mathematics and its practical application in web development.

Invited Talks

"Generative Art in p5.js "
📅 August 2022
📍 ViMEET, Khalapur, Pune , Maharashtra

"Hobbies and Academics "
📅 July 2023
📍 Garware College, Pune, Maharashtra

Explore and Exploit : Briefing
📅 May 2025
📍 Arcticturn Foundation , Pune, Maharashtra

Effective LinkedIn engagement
📅 June 2025
📍 Online for UNLV interns

Volunteering Experience

Deepstambha Charitable Trust
📅 Sep 2024 - Oct 2024,
📍 Pune , Maharashtra

- Contributed to Paryavaran Namastubhyam: Nirmalyapasun Khatanirmiti, an initiative focused on converting floral waste (Nirmalya) from religious festivals into organic manure through systematic composting.
- Addressed environmental issues such as river pollution caused by improper Nirmalya disposal and supported sustainable agricultural practices by promoting organic alternatives to chemical fertilizers.
- Aligned project outcomes with key SDGs, including clean water, responsible consumption, and climate action.
- Collaborated with Indradhanushya under the Pune Municipal Corporation to strengthen community participation and expand the project's implementation across the city.

Extra Curricular

Gardening & Environmental Engagement

- Developed and maintained a terrace garden with over 150 plants. Engagement in creating green spaces for offices and studios.

Classical Kathak Practitioner:

- Completed Visharad in Classical Kathak from Gandharva Mahavidyalaya with First Class. Trained under the Rohini Gharana tradition for over 8 years.
- Performed at cultural venues in Valsad, Pune, and Ujjain.
- Won 1st prize in Group and 2nd prize in Duet at the Kinkini Kathak Dance Competition.
- Contributed to backstage support in organizing and managing dance performances.