Tejasvi Gharat

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Education

•Veermata Jijabai Technological Institute (VJTI) *2021 - 2025*
B.Tech. in Mechanical Engineering CGPA: 7.08 (2024 Expected)

•Veermata Jijabai Technological Institute (VJTI) *2023 - 2025*
Honors Degree in Automobile Engineering CGPA: 8.0 (2025 Expected)

•Bassien Kerala Samajam *2019 - 2021*
HSC Maharashtra Board Percentage: 89.50%

Research and Projects

•Multifunctional Drone for Agricultural Applications *August 2024 - Ongoing*
Designing a multifunctional drone for precision agriculture to enhance efficiency and productivity.

- Designing a drone using **MQ-135**, **DHT22**, and a **thermal camera** for real-time crop health monitoring.
- Using **Raspberry Pi** as a minicomputer and flight controller to process sensor data for early disease detection and irrigation optimization.
- Implementing **machine learning algorithms** to analyze environmental data and provide actionable insights, enhancing farmers' ability to manage crops effectively and sustainably.
- Collaborating with experts to develop solutions that support farmers in underserved communities, enhancing agricultural efficiency and productivity.

•Mars Rover Prototype *Sept 2023 - January 2024*
Developed a Mars Rover Prototype for the International Rover Challenge-24. GitHub Link

- **Led the design and production** of a Mars Rover prototype for the **International Rover Challenge**, showcasing expertise in **robotic design** and **mechanical engineering**.
- **Designed a holonomic suspension system** to enhance the rover's movement and stability on challenging terrains.
- Utilized lightweight materials, such as **AL 6061 T6** and **ABS**, to optimize weight distribution and reduce energy consumption, boosting overall performance and endurance.
- Integrated **advanced sensors**, including **cameras, LiDAR**, and **ultrasonic sensors**, for autonomous navigation and obstacle avoidance.

•Quality Assurance of 3D Printed Parts Using A.I. *Jan 2023 - May 2023*
Implemented a quality assurance system for 3D printed parts using A.I. algorithms. GitHub Link

- **Implemented an AI-driven quality assurance system** for 3D printed parts, utilizing vision-based and sensor-based data analysis to enhance **defect detection accuracy**.
- Successfully integrated predictions from **advanced models**, including **Swin Transformer** and **1D CNN**, achieving greater accuracy in identifying 3D printing defects compared to single models.
- Demonstrated how **machine learning techniques** can **optimize 3D printing settings**, leading to improved product quality and a **reduction in defects**.
- Played a key role in enhancing the quality assurance process, making it more **efficient** and **cost-effective** by minimizing reliance on manual inspections and increasing product yields.

•Sugarcane Juicer Project *July 2024 - October 2024*
Designed a highly efficient sugarcane juicer. GitHub Link

- **Designed a highly efficient sugarcane juicer machine** using **helical gears** and **four rollers** that **maximizes juice extraction** while minimizing energy consumption, tailored for the local market in Mumbai.
- Employed **SolidWorks** and **Ansys** for **design optimization** to ensure the juicer's durability and overall mechanical performance.
- Developed a **power transmission system** using a **V-belt drive** with **nylon spur gears** to enhance operational efficiency and **reduce noise levels**.

•**Self-Navigating Tricycle** *Jan 2023 - May 2023*

Designed an electric tricycle to enhance mobility for visually impaired and disabled individuals. GitHub Link

- **Designed a tricycle frame** that includes an **advanced suspension system** and **easy-to-use steering**, making it wheelchair-friendly and easy to maneuver.
- Added **ultrasonic sensors** and **GPS** to help detect obstacles and navigate accurately.
- Developed a **voice control feature** using speech recognition, allowing users to operate the tricycle simply and intuitively.
- Used strong yet lightweight materials such as **AISI 1050 steel** to balance the tricycle's weight and enhance its durability, leading to better performance.

Mentoring Experience

•**Vishwa VJTI** *April 2023 - Present*

Mechanical Subsystem Head (Astronomy club) VJTI Mumbai

- **Mentoring** over **60** first, second, and third-year **students in mechanical systems**, covering topics chassis design, suspension systems, and robotic arm while sharing practical insights into effective **project management**.
- **Guided** final-year students on advanced topics and projects, while leading a team of over **20 mechanical engineers** in the **design** and **manufacturing** processes for a **Mars Rover Prototype**, ensuring high technical standards and quality compliance.
- **Conducted** hands-on training **sessions** in mechanical design using **SolidWorks** and **Fusion 360** to enhance the design and manufacturing skills of junior students.

•**Technovanza VJTI** *March 2023 - Present*

Chief Design Officer (Tech and Innovation Club VJTI Mumbai

- **Mentoring** a group of **20 juniors** in understanding **graphic design** principles and software applications while providing **assistance** to **10 final-year students** with their projects and design queries.
- **Facilitated workshops** on design software, including **Canva**, **Photoshop**, and **Figma**, aimed at improving students' creativity and proficiency in graphic design.
- **Supervised the design team** in producing visual content for various events, including festivals, guest lectures, and stage backdrops, ensuring alignment with event themes and adherence to high-quality standards.

Professional Experience

•**Techligence Robotics Pvt Ltd** *June 2024 - Present*

Mechanical Intern

- Demonstrated **proficiency** in using industry-standard **CAD software**, such as **AutoCAD** and **Fusion 360**, for **designing** mechanical **components** and **sensor casings**.
- Effectively utilized **3D printing** technology for **rapid prototyping**, enabling efficient design iteration and testing, and contributing to faster product development cycles.
- Collaborated effectively with electronics and software engineers to ensure seamless **integration of mechanical designs in educational robots**.
- Demonstrated a strong focus on **designing** components that were both **efficient** and practical to **manufacture**, contributing to the overall **cost-effectiveness** and **scalability** of the educational **robots**.

Research Interest

•**Creating self-operating robots** for tasks like weeding, harvesting, and planting to boost productivity and decrease reliance on human labor.

•**Designing sustainable agricultural machinery** powered by solar energy to reduce costs and environmental impact.

•**Developing cost-effective manufacturing techniques** to enhance machinery quality and efficiency.

•**Designing machinery for sorting, cleaning, and packaging** agricultural products to simplify post-harvest processes.

•**Implementing precision agriculture techniques** to optimize resource usage and improve overall crop yield.

Professional Societies

•**American Society of Mechanical Engineers (ASME),VJTI** *Jan 2024-Present*
Engaged in networking, professional development, and participation in mechanical engineering events.

•**Bureau of Indian Standards (BIS) Committee, VJTI** *Dec 2023- Present*
Serving as Design Lead to develop and establish engineering standards.

•**AERO VJTI** *Jan 2022 – Feb 2023*
*Participated in **SAE** competitions, focusing on aerospace engineering challenges and team collaboration.*

Achievements and Awards

•**International Rover Challange:**Team Rank 16 *Jan 2024*

•**Maharashtra Common Entrance Test:** Scored 95% *Sept 2021*

•**Certificate of Achievement:**Achieved 89.50% in HSC examination. *Aug 2021*

•**National Science Olympiad:**School Rank 2, State Rank 93, National Rank 468/6050 *Nov 2018*

•**Certificate of Achievement:**Achieved 80.20% in SSC examination. *Nov 2018*

•**Certificate of Appreciation:** Participated in Smart Mob for Golden book of World Record. *Oct 2016*

Positions of Responsibility

•**Design Head ,** Debate and Literary Activities, VJTI *Feb 2024 - Present*

•**Class Representative,** Mechanical Branch *Feb 2024 - Present*

•**Mechanical Head,** Vishwa VJTI (Astronomy and Space Science Club) *April 2023 - Present*

•**Chief Design Officer,** Technovanza VJTI *March 2023 - Present*

•**Training and Placement Officer,**Mechanical Branch, VJTI *March 2023 - Present*

Technical Skills

•**Design and Simulation Software:** SolidWorks, Ansys, AutoCAD, Fusion 360, Robo Analyzer

•**Programming and Scripting:** Matlab, Python, C++ (basic)

•**Technical Writing and Documentation:** LaTeX, Microsoft Word, Google Docs

•**Graphics and Presentation Tools:** Canva, Adobe Photoshop, Microsoft PowerPoint

•**Data Analysis and Visualization:** Excel (Advanced Functions)

•**Other Tools:** Git, 3D Printing, CNC Machining

Hobbies

•**Tutoring:**Teach first-year engineering students in Physics, Chemistry, and Mathematics.

•**Drawing:** Completed Elementary and Intermediate drawing exams

•**Music:** Passionate about singing bhajans in Sanskrit

•**Harmonium Teaching:**Teach harmonium at a temple.

•**YouTube:**Create animated videos with 2.5K YouTube subscribers.