

Shantanu Panda

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EDUCATION

- National Institute of Technology** Nov 2021 - Jun 2025
Bachelor of Technology in Mechanical Engineering : CGPA: 7.92
Rourkela, India
- Delhi Public School, IOCL Paradip Refinery** Apr 2019 - Mar 2020
Class XII CBSE : Percentage: 93.4%
Paradip, India
- Delhi Public School, IOCL Paradip Refinery** Apr 2017 - Mar 2018
Class X CBSE : Percentage: 89.4%
Paradip, India

EXPERIENCE

- Machine Dynamics and Robotics Lab** May 2024 - Present
Research project under Dr. DRk Parhi
 - Focus on designing and optimizing a five-thruster single-body AUV using SolidWorks for 3D modeling and ANSYS for simulating thruster performance. Aim to maximize thrust efficiency and minimize heat generation in ESC and motor units.
 - Conduct a detailed analysis of thruster performance factors, including blade number, shape, angle, and propeller diameter. Author a research paper on methodologies to enhance propulsion systems and improve thermal management.
- TRIDENT GROUPS** May 2024 - Jul 2024
Graduate Engineer Trainee
 - Developed a mechanical solution to enhance the Texpa lock stitching machine's efficiency by automatically actuating the machine to backtrack and eliminate dead ends caused by thread changes every 50-60 meters (approximately every minute). This mechanism prevents stitching gaps, reducing seam failure rates by over 90%, and ensures consistent stitching across 100% of the finished products. The solution minimizes manual intervention by 80%, improving overall production efficiency and enhancing the durability of textile products.
 - Demonstrated proficiency in mechanical design, automation, and problem-solving, leading to a significant quality improvement in the textile manufacturing process
- IOCL PARADIP REFINERY** May 2023 - Jul 2023
Graduate Engineer Trainee
 - Gained hands-on experience in refinery operations and mechanical processes at IOCL. Analyzed and documented various types of mechanical seals, detailing their importance, differences, and maintenance procedures. Prepared a comprehensive report on mechanical seals, contributing to safety and efficiency improvements. Collaborated with the maintenance team, enhancing knowledge of equipment upkeep and refinery project planning.

TECHNICAL SKILLS

- Languages :** Python, C++
- Operating Systems :** Linux, Windows
- Softwares Tools :** ROS, AutoCAD, Matlab, OnShape, Ansys, SolidWorks, Arduino
- Courses :** Strength of Materials, Machine Design, CAD/CAM, Product Design and Development, Thermodynamics, Heat Transfer, Refrigeration and Air Conditioning, Fluid Mechanics, Computational Fluid Dynamics (CFD), Finite Element Analysis (FEA), 3D Modeling and Simulation, Robot Kinematics

ACHIEVEMENTS

- Semi-finalist at eYantra Robotics Challenge, IIT Bombay** Apr 2023
Secured a spot among the top 10-30 teams in the world developing Holonomic Art Bot
[Video](#)
 - My team designed a 3-wheeled holonomic drive bot to draw on the floor. I designed and optimized the chassis design according to the needs of the electronics and software team. also made the calculation for required power and torque with specified holonomic wheels for good and precise vehicle dynamics of the holonomic bot.
- Finalists at Flipkart Grid 4.0** Jan 2023
Secured position in top 8 teams in India developing an Autonomous Delivery Drone
[Video](#)
 - Designed a quadcopter for efficient package delivery within a specific weight limit. Calculated motor selection based on maximum thrust requirements and optimized propeller choice for required thrust at limited RPMs. Created a robust housing for sensor integration.
- Second Runners-up at Voyager, IIT Kharagpur** Jan 2023
Ranked among competing top 30-40 teams by successfully presenting Color-Sensing Line Follower
[Video](#)
- ROBOFEST-GUJARAT 3.0 GUJCOST** May 2023
Attained position in top 20 teams nationwide by presenting ideation on 6-wheeled ROVER
 - Designed a 6-wheeled rover featuring a rocker-bogie mechanism to navigate rocky terrains. Conducted torque calculations and RPM ratings to ensure smooth movement. Integrated automated navigation with Lidar mapping and GPS coordinates for precise control and enhanced operational efficiency.

PROJECTS

- **Intelligent Ground Vehicle** [link](#) Dec 2022 - Present
 - Mechanical Subsystem Lead for IGVC: Led the design and fabrication of the chassis, including material selection, budget estimation, and ensuring it met competition standards. Focused on optimizing strength, weight, and cost efficiency.
 - Chassis Design and Analysis: Designed and analyzed the chassis structure using SolidWorks for 3D modeling and ANSYS for comprehensive structural, static, and dynamic simulations. Validated design integrity under various loading conditions by running stress, strain, and fatigue tests, ensuring durability and optimal performance.
 - Chassis Manufacturing and Vendor Coordination: Managed the manufacturing process using 3D printing, welding, and metal laser cutting. Coordinated with vendors to procure essential components, ensuring timely delivery and adherence to quality standards.
- **6 DOF Mechanical Arm** [link](#) Mar 2024 - Present
 - Mechanical Design and Analysis: Engineered a 3 DOF mechanical arm, focusing on optimizing the mechanical design through structural, static, and dynamic analysis in Ansys. Carefully selected materials to enhance strength-to-weight ratio and durability, ensuring high precision and reliability in automation tasks.
 - Motor and Joint Selection: Performed detailed motor calculations in MATLAB to determine torque and speed requirements, selecting appropriate motors with encoders for accurate control. Chose high-precision joints to minimize backlash and ensure smooth operation, enhancing the arm's precision and control in automated processes.
- **6 - Wheeled ROVER** [link](#) Jan 2023 - Sep 2023
 - Design and Research: Led the design and research of a 6-wheeled rover, focusing on developing a robust structure optimized for rocky terrains. Conducted in-depth analysis to ensure the rover's durability and performance under challenging environmental conditions.
 - Key Mechanisms and Components: Engineered a rocker-bogie suspension system and differential mechanism for enhanced stability and maneuverability on uneven surfaces in Solidworks. Designed specialized wheels and bearing joints to improve traction and reduce wear, ensuring smooth operation across varied terrains.
 - Critical Calculations and Performance Optimization: Performed detailed motor calculations to achieve a maximum speed of 5 m/s on a 45-degree inclined grass surface. Using MATLAB ensured the rover's design provided sufficient torque and power to traverse rocky and uneven terrains with stability and precision.
- **Holonomic Art Bot** [link](#) Aug 2022 - Mar 2023
 - Chassis Design and Optimization: Engineered and optimized the chassis design for a 3-wheeled holonomic drive bot in Solidworks, ensuring seamless integration with electronics and software components. Focused on structural integrity and weight distribution to meet the specific requirements of precise floor drawing tasks.
 - Power and Torque Calculations: Conducted detailed power and torque calculations, selecting holonomic wheels to achieve precise vehicle dynamics with MATLAB. Ensured optimal motor performance and stability, enabling smooth and accurate movements essential for high-precision tasks.
- **HEXAPOD** [link](#) Jan 2023 - Aug 2023
 - Hexapod Design and Analysis: Designed a hexapod robot in Solidworks, focusing on optimizing the structural design and kinematics for stable and efficient locomotion. Conducted static and dynamic analysis to ensure balance, flexibility, and load-bearing capacity across six legs, enhancing the robot's ability to navigate diverse terrains.
 - Manufacturing and Integration: Led the manufacturing process, utilizing precision techniques such as 3D printing to fabricate the hexapod's components. Integrated servo motors and control systems to achieve synchronized movement across all legs, ensuring robust performance and smooth operation in complex environments.
- **Rubics Cube Solver** [link](#) Aug 2022 - Feb 2023
 - Design and Calculations: Engineered a Rubik's Cube solver focusing on precise mechanical design and optimization in Solidworks. Conducted detailed calculations for motor torque, gear ratios, and actuator movements to ensure rapid, accurate manipulation of the cube's faces.
 - Flexibility and Integration: Designed the solver with adaptable mechanisms, allowing it to integrate with any standard Rubik's Cube seamlessly. Ensured the system's flexibility through adjustable grips and sensors, enabling compatibility with various cube sizes and designs.

POSITION OF RESPONSIBILITY

- **Mechanical Lead at Institute Robotics Club** May 2022 - Present
 - As Mechanical Lead for the Cyborg Robotics Club, I managed and oversaw all major projects, mentored junior members in design and fabrication, and successfully secured funding for various club initiatives. Ensured project completion while fostering a collaborative and innovative environment.
- **Co-ordinator of Deathrace and Robusumo at InnoVision of NITR** Nov 2023
 - Managed two major events at Innovision, the tech fest of NIT Rourkela, with a footfall of 600+ participants. Oversaw procurement, scheduling, and fixtures for competitions, and secured funding and sponsorships, ensuring the smooth execution and success of the events.