

Shivanshu Vishwakarma

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EDUCATION

International Institute of Information Technology, Naya Raipur *CGPA: 9.14/10*
B.Tech in Data Science and Artificial Intelligence (Expected Graduation: July 2027) *2023 – Present*

Central Hindu Boys School, Varanasi *Percentage: 96.6%*
Class 12th (CBSE Board) *2021 – 2022*

RELEVANT COURSEWORK

Computer Vision, Reinforcement Learning, Artificial Intelligence, Autonomous Mobile Robotics, Machine Learning

SKILLS

Machine Learning: PyTorch, Scikit-learn, Pandas
Programming Languages: Python, C++
Robotics Frameworks: ROS 2 Humble, Gazebo, Nav2, MoveIt 2
Web Technologies: Flask, JavaScript, Django, Streamlit
Tools & Platforms: Git, GitHub, Linux, Fusion 360
Developer Tools: VS Code, Google Colab, Jupyter, RViz

EXPERIENCE

e-Yantra, IIT Bombay *Mumbai, India*
Robotics Research Intern (ERTS Lab, CSE Dept.) *May 2025 – July 2025*

Industrial Robotic Arm (UR5) Remote Automation *Certificate — [YouTube](#)*

- Implemented low-latency low-level control of a UR5 industrial arm using RTDE APIs for reliable remote operation.
- Developed filtered force-feedback processing (Butterworth + averaging), and transformed force from base to tool frame for better contact detection.
- Integrated collision checking, workspace constraints, singularity detection, and RRT-based planning for safer motion execution.
- Built a Gazebo simulation environment for sim-to-real validation, reducing deployment errors on hardware.

PROJECTS

eYantra Innovation Premier League – Precision Herbicide Sprayer *Oct 2025 – Dec 2025*

- Co-designed an autonomous precision herbicide sprayer for small-farm use to reduce herbicide waste and labor cost.
- Built camera-guided weed detection and pan-tilt nozzle targeting for spot spraying.
- Prototyped initial contour-based weed detection, then explored ML model-based detection under varied lighting and crop conditions.

NXP AIM Warehouse Challenge *[GitHub](#) — [YouTube](#)*

- Built a ROS 2 autonomous navigation and perception pipeline (SLAM, Nav2, YOLOv5, QR decoding) for the NXP B3RB rover.
- Implemented heuristic shelf traversal and goal selection using QR-driven logic for efficient warehouse navigation.
- Added front/back shelf identification and real-time object data publishing in Gazebo.

Webcam-based 3D Interaction System *[GitHub](#) — [YouTube](#)*

- Developed a low-cost 3D interaction system using OpenCV, MediaPipe, Unity, and UDP hand-landmark streaming.
- Enabled gesture-based interactions such as grabbing, rotating, and zooming.
- Built an interactive solar-system learning demo for education and accessible interaction use-cases.

TurtleBot3 SLAM & Navigation *[GitHub](#) — [YouTube](#)*

- Simulated TurtleBot3 in a custom Gazebo world using ROS 2 Humble and Cartographer SLAM for 2D mapping.
- Implemented autonomous goal-based navigation with Nav2 and obstacle avoidance.
- Extended simulation learnings to physical TurtleBot3 deployment.

ACHIEVEMENTS

e-Yantra 2026 – IIT Bombay

Krishi Drone Theme – Qualified Stage 1

March 2026

- Implemented PID control (pitch, roll, throttle) using x/y/z error feedback for drone stabilization and waypoint navigation.
- Built a live error visualizer and waypoint hold logic to improve controller tuning.
- Completed simulation tasks; hardware round reached partial stability under battery-voltage constraints. [\[YouTube\]](#)

e-Yantra 2025 - IIT Bombay

Balancing Builder Bot (BB) Theme – Qualified Stage 1 (All India Rank 8)

March 2025

- Built a two-wheeled balancing bot capable of navigating uneven roads and overcoming obstacles, while also performing pick-and-place tasks with a manipulator.
- Successfully qualified Stage 1 with All India Rank 8 and completed all tasks of Stage 2. [\[Certificate\]](#) [\[YouTube\]](#)

EXTRACURRICULAR ACTIVITIES

Robonyx Club – Vice Head

Conducted sessions on Robotics, Embedded Systems, ROS, sensors/actuators

Aug 2024 – Aug 2025

Ciphercell Club – Core Member

Organized events focused on Linux and cybersecurity tools.

Aug 2024 – Aug 2025