

# Abhishek Vilas Chaudhari

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**Portfolio:** - <https://sites.google.com/view/abhishekvch-portfolio> | **LinkedIn:** - <https://www.linkedin.com/in/abhishekvchaudhari/>

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## EDUCATION

**Master of Science in Robotics** | University of Minnesota, Minneapolis, Minnesota, USA | GPA: 3.667/4    *Sept 2023 – May 2025*

**Bachelor of Mechanical Engineering** | Savitribai Phule Pune University, India | GPA: 8.89/10    *Aug 2017 – May 2021*

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## SKILLS

- **Programming and Platforms:** Data structures, SQL, C++, Python, ROS, Carla, Windows and Linux
  - **Developers Tools:** VS Code, Eclipse, Jira, Git | **Simulation Tools:** Gazebo, RViz, ROS
  - **CAE and FEA Tools:** CATIA V5, SolidWorks, NX, Inventor, 3D Experience, ANSYS, MATLAB, Teamcenter 11, Ciro
  - **Relevant Courses:** Mechatronics, Design of Machine Element, Artificial Intelligence, Robot Vision, Machine Learning, Computer Graphics, Intelligent Robotic Systems (Motion Control, Kalman Filter, Particle Filter, SLAM)
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## RESEARCH AND INNOVATION

- **Patent Granted** | Patent No. 379417 | Title of Invention: Apparatus for Pulling and Shredding Plant Stalks
  - Proposed novel automated mechanism for pulling and processing cotton crop residues, diversifying crop waste into energy.
  - Secured Biotechnology Ignition Grant (USD 60,000) for research and commercialization of Agri robotics technology.
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## RESEARCH WORK & PROJECTS UNDERTAKEN

**Development of a quadruped robot**, Robotics Lab at UMN | *Role: Graduate Research Assistant*    *Jan 2024 - Present*

- Developing robot for high-throughput crop phenotyping using robot navigation algorithms, computer vision, and AI.
- Using Linux on the robot's embedded system and setting up CAN BUS communication between sensors and controllers.
- Utilizing Gazebo for simulation of motion planning and autonomous navigation in the complex terrain environment.
- Setting up ROS nodes for perception, control, and planning on robot's embedded PC.

**Deep Neural Networks Based Visual Cognition Assistive System for the Visually Impaired**    *Oct 2023 - Dec 2023*

- Developed real-time embedded assistive system on NVIDIA Jetson Orin Nano for object detection and depth estimation.
- Integrated OpenCV, CUDA NN, PyTorch and TensorFlow in Python to capture, analyze, and describe the environment.
- Published real-time insights over Bluetooth headphones providing audio navigation cues using camera frame at 30+ FPS.

**Warehouse Automation System**    *Nov 2023 - Dec 2023*

- Developed warehouse automation pipeline in Gazebo utilizing Universal Robots UR5 and ROS architecture.
- Created 3D simulated environment with RViz and Tensor Flow for robotic pick-and-place task finalization using MoveIt.

**Computer Vision-based Sports Performance Analytics System**    *Mar 2021 - May 2022*

- Developed a training algorithm that utilizes past game video feeds for data analysis and visualization.
  - Worked on Pixellot Air (vision sensor) sports camera for tracking and recording every pose for players.
  - **Tools Used** - Streamlet and Python libraries for data visualization, Media Pipe cross-platform pipeline framework to build custom machine learning solutions for streaming media, OpenCV for Video Posture Analysis, Jupyter for programming.
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## PROFESSIONAL EXPERIENCE

**TATA Technologies**, Pune, Maharashtra, India. | *Role: Functional Consultant*    *Dec 2021 – July 2023*

- Utilized C, C++, and Python to develop new features and provide support for Siemens Teamcenter applications.
- Led a team of 10 as zonal lead for functional testing of vehicle catalog web applications and software packages.
- Administered services on Linux servers and managed data using DbVisualizer SQL client and database management tools.
- Prototyped and validated new algorithms and product capabilities for Teamcenter 14 modules to enhance functionality.
- Architected TC VIS automation project frameworks utilizing Git and Jira software tools by rapidly resolving bugs.
- Contributed to the development and deployment of on-site premises machine to the virtual machines VDI in Azure cloud.

**INALI Foundation**, Pune, Maharashtra, India. | *Role: Robotic Design Intern*    *Feb 2021 - Mar 2021*

- Collaborated with researchers at Delft University of Technology, Netherlands on the lightweight and first multi-articulating Delft Cylinder Hand, developed a robotic arm which is designed using Myoelectric and EMG sensors feedback loop.
- Worked on MATLAB software to simulate and refine robotic joint motions and grip patterns, improving dexterity.
- Utilized 3D printing techniques including FDM (Fused Deposition Modeling) to rapidly prototype robotic mechanisms.

**Dana - ANAND Group**, Pune, Maharashtra, India | *Role: Robotic Intern*    *Oct 2020 – Feb 2021*

- Worked on maintenance of Fanuc 5-axis robot for manufacturing welding operations on vehicle chassis and body parts.
  - Done calibration and installation of PMD distance sensor to ensure quality of differential housing in manufacturing line.
  - Implemented non-conformance handling procedures to ensure manufacturing standards to avoid risks and failures.
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## AWARDS AND HONORS

- Awarded **Fulbright scholarship** from the Government of India to pursue graduate robotics research in the United States.
- **Champion of the Month Award** at **Tata Technologies** for business process automation by utilizing Python language.
- **Winner** of **AAKRUTI 2020**, a Nationwide product design contest organized by **Dassault Systems**.