PRANAV **BANGA**

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Creative and results-driven **Mechatronics Engineer** specializing **in robotics, automation, mechanical design, and real-time embedded systems**. Extensive experience in **3D additive manufacturing, CAD modeling, and autonomous navigation using ROS, LIDAR, and computer vision**. Proven track record leading AI-driven automation, predictive maintenance, and system optimization projects at Magna Electronics and Nuclear Promise X. Skilled in multiple coding languages such as **Python, C++, DAX** with expertise in **SolidWorks, ROS, OpenCV, and machine learning frameworks**. Adept at cross-functional collaboration, project management, and delivering innovative engineering solutions for real-world applications. You can check out my work and projects here: " Portfolio Link "

TECHNICAL SKILLS

- Solid Works
- Python
- Power Automate
- SQL/MySQL
- Gazebo/Unreal Engine
- YOLO V8
- FreeCAD/Auto CAD
- C #/ C++
- Power Bi (DAX, M Language)
- Factory IO, WinSPS, PLC
- Tensor Flow
- HTML5/CSS3
- Rhinoceros CAD
- ROS I & II
- Power Apps
- Rob flow
- Open CV
- MATLAB

COURSE WORK

- Computer-Aided Design
- Microprocessors and Digit Syst
- Electronics Circuit Design
- Industrial Automation
- Robotics And Automation
- Sensor & Instrumentation
- Control Systems
- Real Time Embedded Systems
- AI and Machine Learning
- Actuators and power electronics
- Control Systems
- Mobile Robotics

EDUCATION

B.Eng. (Hons) Mechatronics Engineering | Ontario Tech University, 2020-2025
GPA: 3.13/4.3, Received scholarships for maintaining an 80% grade

WORK EXPERIENCE

Robotics Instructor | Obotz, Oshawa
JUNE 2025 – PRESENT

- Instruct students from elementary to high school on robotics concepts, ranging from beginner kit assembly to advanced Raspberry Pi and Arduino logic projects.
- Spearheading specialized Level 9 courses in additive manufacturing and CAD design, teaching 3D modeling and rapid prototyping fundamentals
- Deliver engaging, hands-on lessons covering mechanical systems, electronics, and programming in multiple coding languages
- Design and adapt curriculum to meet diverse student needs, promoting STEM education and critical problem-solving skills
- Contribute to the community by sharing professional engineering knowledge and fostering an inclusive, supportive learning environment

Test Engineering Intern | Magna Electronics, Markham
JAN 2024 – AUGUST 2024

- Developed and maintained dashboards for real-time module counts, failure analysis, and yield comparison, enabling data-driven decision-making for production efficiency.
- Designed and implemented a temperature sensor system to log data and predict potential overheating issues, leading to improved machine reliability and minimized downtime.
- Optimized mechanical components by refining resoldering techniques, applying heat shrink protection, and redesigning fixtures to prevent mechanical wear and address solder joint issues.
- Tracked key performance indicators (OEE, FTT, KPI) to ensure continuous improvement of production metrics, aligning with Magna's quality standards and operational goals.
- Awarded Above and Beyond Recognition for the work In automation and training of new batch of interns .

Innovation Catalyst Intern, Opportunity Lead | Nuclear Promise X, Kincardine
MAY 2023 – OCTOBER 2023

- Orange Badge Certified for Bruce Power, As Lead Data Analyst for the Wrench Time project, I analyzed complex data sets in Power BI, identified key trends, and presented findings to stakeholders, helping the team make informed decisions.
- Proposed innovation solutions for Bruce Power for critical path in outages
- Worked on SPOT to find a custom payload solution using Raspberry Pi. Also, helped organize a complete SPOT knowledge tutorial series for new interns joining the team.

- Automated Workflow for Field Excellence Team involving the creation of Power automated workflow for walk-down approval.
- Appointed as an Opportunity Lead for Xprojects, successfully organized a company-wide Hackathon for Innovation and Inspiration among colleagues, and was responsible for maintaining OKRs for different company-wide SRED Xperiments.
- Scheduled different Innovation opportunities in MS Project for weekly progress and maintained OKR for the same.
- Led a team to successfully create a POC for an AI Machine Learning model developed in Yolo V8 to automate wrench time and work productivity analysis.

Peer Program Assistant, Peer Tutor | Ontario Tech University, Oshawa

May 2022 –January 2023

- Scheduled over 60 students for Peer tutoring and PASS leadership
- Maintained and tracked records for working Peer tutors and PASS leaders
- Assisted Student Learning Center for Moderating My Start Academic Orientation and Gave Tutoring to peers for specific courses

Chief Technical Officer (CTO)| ForeSight Design, GTA

JAN 2024 – PRESENT

- Led technical support and backend development for various client projects, delivering robust software solutions tailored to businesses
- Played a pivotal role in expanding Foresight Design's portfolio by acquiring clients and fostering long-term relationships.
- Directed the development of software products for clients, aligning technological solutions with their business growth strategies, and contributing to the dynamic expansion of the agency.

PROJECTS

Autonomous Telescope Mount System (A.T.M.S)| Ontario Tech University

SEPTEMBER 2024 – APRIL 2025

- Designed complete Right Ascension (RA) and Declination (Dec) axis assemblies in CAD (SolidWorks), performing mechanical stress and strain analysis and tribology study to validate load-bearing capacity for autonomous celestial tracking.
- Executed large-scale additive manufacturing, 3D printing over 10 kg of material to prototype critical parts, fabricated hardened steel gears, axles, and machined metal arc mounts to achieve industrial-grade mechanical robustness.
- Developed embedded software modules for stepper motor control, real-time server communication using Flask-SocketIO, and integrated motion profiling algorithms for smooth and accurate tracking.
- Architected full electrical systems, including motor driver selection, limit switch integration, power management, and sensor interfacing for precise robotic actuation.
- Led cross-functional hardware and software teams, coordinated action registrars and project sprints, and served as the primary Single Point of Contact (SPOC) to maintain system integration coherence across all domains.

Worksight AI | Bruce Power, Nuclear Promise X

JUNE 2023 – OCTOBER 2023

- Intense Research to apply machine learning for work productivity and anomaly analysis in a working environment
- Use of Roboflow for creating custom datasets revolving around a machine shop, eventually switching to Google vertex for AI Dataset formation.
- Interference of video with YOLO V8, Open CV ML Model to recognize specific activity in Bruce Power further development included using GPT 4 to identify work and anomalies.
- Creation of Work Breakdown Structure and Cost Benefit Analysis for the project for stakeholder inquiries.
- Creating a POC report for the stakeholders to finalize the MVP: Most Viable Product.

EcoCharge – Sustainable Battery Monitoring System| Ontario Tech University

SEPTEMBER 2024 – DECEMBER 2024

- Led electronics design and full system manufacturing for a modular lithium-ion battery pack (4S3P, 16.1V nominal), integrating a custom BMS with thermal, overcurrent, and balancing protection using old batteries
- Completed extensive soldering of BMS modules, thermistors, and current sensors, managing end-to-end electronics assembly and validation.
- Developed real-time sensor fusion architecture (INA219, DHT11) across Arduino Mega and ESP32, enabling continuous data transfer using UART, PWM fan control, and Wi-Fi dashboard monitoring.

Autonomous Lidar and Camera Based Navigation| Ontario Tech University

NOVEMBER 2023 – APRIL 2025

- Developed an autonomous navigation system on TurtleBot3 using ROS, integrating camera-based vision and LIDAR for real-time environment perception.
- Engineered a monocular vision pipeline to enable lane following, dynamic obstacle detection (traffic cones), and pothole avoidance through HSV color filtering and ROI techniques.
- Programmed adaptive behavior logic to autonomously stop at red traffic lights, wait for green signals, and cross intersections safely without human intervention.
- Designed and implemented reactive lane-switching maneuvers around construction zones by dynamically detecting cones and executing predefined velocity command sequences.
- Achieved seamless node orchestration for modular tasks (lane following, traffic light handling, obstacle avoidance) using custom ROS nodes and architecture-based state management.