Pranav Puttagunta

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EDUCATION

University of California, San Diego, B.S. Computer Science with Business Minor, **GPA 3.9** Sep 2024 - Present
Relevant Coursework: Data Structures, Object-Oriented Programming, Systems, Machine Learning, Algorithms

TECHNICAL SKILLS

Languages: Advanced in **Java**, **Python**, **C**; Proficient in **JavaScript**, **Assembly**
Frameworks/Tools: Flask, React, SQL/NoSQL, Git, REST APIs, OpenCV, TensorFlow, PyTorch, ROS, LangChain, LangGraph, Open3D
Concepts: OOP, CI/CD, Agile, Computer Vision, Neural Networks, RAG, Agentic AI, NLP, Autonomous Systems, Cloud Computing, Distributed Systems, Deep Learning, Backend Dev, Linux/Unix

EXPERIENCE

UCSD Advanced Robotics Control Lab - *Research Assistant | Python, Point Clouds, Reinforcement Learning* Mar 2025 - Present
- Designed **motion planning algorithms** with point clouds, enabling more precise and reliable **autonomous wound treatment**.
- Built 3D wound reconstruction pipelines with **surface fitting, mesh optimization**, and Signed Distance Field tools in Python.
- Applied optimization methods (e.g., **Monte Carlo Tree Search**) to **improve decision accuracy** for robotic wound treatment.

Yonder Dynamics - *Autonomous Systems Developer | Python, ROS, RTK GPS, Vision, SolidWorks* Oct 2024 - Present
- Engineered a **heartbeat fail-safe** that ensured **autonomous return-to-base** on signal loss, improving reliability in field ops.
- Extracted **RTK GPS** data via pyubx2 and **ROS** for path planning and obstacle avoidance algorithms on the Pi and Jetson.

STEM Robotics Mentor (VEX & FRC) - *Instructor & Coach | Python, Onshape, Vision, Java* Jun 2025 - Sep 2025
- Taught Onshape CAD and Python programming to VEX teams; guided students through the **full robot design** lifecycle.
- Mentored rookie FRC team in **Limelight vision targeting** and **autonomous navigation** fundamentals.

Brains4Drones - *Software Engineering Intern | Python, Open3D, OpenCV, YOLO, Point Clouds, Sensor Fusion* Mar 2022 - Dec 2024
- Built **LiDAR data pipelines** (GDAL, Open3D, Laspy) to simulate drone flights, enabling **more efficient mission** optimization.
- Developed **TensorFlow-based crack detection** models to automate aerial inspection analysis, **reducing manual review** time.
- Integrated **REST APIs**, OpenCV, and Bing/Google Maps APIs in a **3D GUI** to overlay mission paths and safe launch zones.

FIRST Robotics Challenge (Team 9088) - *Software Lead/Team Co-Founder | Java, SolidWorks, Vision* Jun 2022 - May 2024
- Led development of modular Java subsystems, including **PID-tuned swerve drive**, **autonomous navigation**, **computer vision**.
- Collaborated cross-functionally to integrate software with mechanical and vision hardware systems.

PROJECTS

PrepNotch - *LLM-Powered Personalized Tutoring Platform* LangChain, LangGraph, RAG, Cursor, AWS
Designing an **agentic tutoring system** that creates dynamic learning plans from user goals and documents.
- Built a LangGraph+tools-based multi-agent workflow with persistent memory, applying **NLP and RAG** methods that automated lesson planning, quiz creation, and feedback, streamlining **personalized tutoring** tailored to student goals.
- Developed an **AWS** Table of Contents-based **context-minimizing** indexing tool for LLMs to access educational materials.
- https://github.com/pranavputtagunta/prep_notch

VisLink - *Vision-Powered Computer Assistance (1st Overall @ SacHacks VI)* Python, OpenCV, MediaPipe
Created a **machine learning-powered** desktop navigation interface for users with limited mobility.
- Enabled **hands-free computer control** through facial tracking and voice recognition, **expanding user accessibility**.
- Built a **gesture detection pipeline** with MediaPipe and OpenCV; voice processing via speech recognition.
- https://github.com/pranavputtagunta/vislink

OpenLabel - *Vision & LLM-Powered Allergy and Diet Recommender (1st in Track @ DiamondHacks)* Python, OpenCV, Gemini
Built a dietary preference agent that evaluates food packaging through image input and ingredient scanning.
- Designed **CV + Gemini** pipeline that parsed product labels to generate personalized **allergy-safe food recommendations**.
- Generated **user-specific** buying recommendations using LLMs (Gemini API) based on allergies and goals.
- https://github.com/pranavputtagunta/OpenLabel

Alethiea - *Agentic-Driven Healthcare Management (Berkeley AI Hackathon)* Python, Streamlit, OpenCV, Gemini, Letta
Developed a **personalized pill tracker** that offers **medication guidance** and **autonomous alerts**.
- Used **OpenCV and Gemini API** to detect and classify pills from images; tracked dosage timelines with memory modules.
- Designed an **agentic framework** to auto-adjust routines and send alerts or contact physicians as needed.
- https://github.com/pranavputtagunta/aletheia

LEADERSHIP & AWARDS

National Merit Finalist • SacHacks VI 1st Place • DiamondHacks Winner • NASA Aerospace Scholars (Systems Lead) • FIRST Robotics Dean's List Nominee • PURE Nonprofit Chapter Director • Presidential Gold Service Award