# Pranav Puttagunta

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## EDUCATION

**University of California, San Diego,** B.S. Computer Science, Minor in Business, **GPA 3.92** Sep 2024 - Present
Relevant Coursework: Data Structures, Object-Oriented Programming, Systems, Machine Learning, Algorithms

## EXPERIENCE

**UCSD Advanced Robotics Control Lab** - *Research Assistant | Python, Point Clouds, Reinforcement Learning* Mar 2025 - Present
- Contributing to development of a **robotic automated wound treatment** procedure by designing motion planning algorithms.
- Designed **heuristic + MCTS** and **RL** algorithms for robotic wound treatment, minimizing gauze waste and compute costs.
- Developed **mesh reconstruction** pipelines from point-cloud scans with Open3D for accurate 3D **wound reconstruction**.
- Collaborated with researchers to integrate algorithms into **humanoid robotic prototypes** for clinical feasibility studies.

**Yonder Dynamics** - *Autonomous Systems Developer | Python, ROS, RTK GPS, Vision, SolidWorks* Oct 2024 - Present
- Created **autonomous traversal** routines across varied terrains for a **Mars Rover** for University Rover Challenge missions.
- Integrated **RTK GPS** with Pixhawk, boosting GPS accuracy from **~10m to ~10cm**, decreasing navigation failure from 30% → 0%.
- Designed and built **return-to-base** fail-safe triggered by heartbeat loss, **cutting mission failures** from 50% → 20%.
- Implemented **ROS-based sensor fusion** on Jetson/PI platforms to enhance **autonomous navigation** reliability.

**STEM Robotics Mentor (VEX & FRC)** - *Instructor & Coach | Python, Onshape, Vision, Java* Jun 2025 - Sep 2025
- Coached **3 VEX teams + 1 FRC team** on CAD, iterative and collaborative design, PDRs, and programming fundamentals.
- Guided FRC team to make swerve robot in 1 week, **vision-based autonomous** in 2 weeks, accelerating competition readiness.

**Brains4Drones** - *Software Engineering Intern | Python, Open3D, OpenCV, YOLO, Point Clouds, Sensor Fusion* Mar 2022 - Dec 2024
- Created TensorFlow crack-detection models, **automating aerial inspection** analysis and reducing manual review time.
- Led development of **PreCheck** LiDAR-powered mission planning tool leveraging GPU vectorization, KNN algorithms for obstacle detection, and point-cloud processing with colormaps, **reducing mission failures** from 70% → 10%.
- Attracted **2 clients** by presenting PreCheck simulations; integrated REST APIs and terrain analysis for **safer mission planning**.
- Integrated REST APIs and Bing/Google Maps with OpenCV to **visualize mission paths,** launch zones, and terrain obstacles.

**FIRST Robotics Challenge (Team 9088)** - *Software Lead/Team Co-Founder | Java, SolidWorks, Vision* Jun 2022 - May 2024
- Developed **modular code architecture** for subsystems, including swerve drive and **vision-based autonomous** navigation.
- Built autonomous code that helped team advance to **state finals** and earn **Innovation Award** and **Inspire Award** recognition.
- Mentored teammates on Git workflows, object-oriented programming, and debugging strategies.
- Scaled the team to **30+ members**, securing **$10,000+** in sponsorships, and expanding **STEM awareness** in schools.

## PROJECTS

**PrepNotch** - *LLM-Powered Personalized Tutoring Platform* LangChain, LangGraph, RAG, Cursor, AWS
- Creating an **personalized agentic tutoring** system that creates dynamic learning plans from user goals and documents.
- Developed multi-agent workflow with **persistent memory** for automated lesson planning, quizzes, and feedback.
- Designed AWS-based **context indexing** system, optimizing LLM query efficiency for educational materials.

**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.
- Designed **CV + speech** app enabling hands-free computer use for immobile users; Consulted doctors for user requirements.
- Achieved **80%** blink/face detection accuracy and **70%** speech recognition reliability with **OpenCV + MediaPipe** processing.

**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.
- Built **OpenCV + Gemini** vision pipeline to scan product labels and extract ingredients for **allergy-safe recommendations**.
- Integrated **LLM reasoning** for user-specific buying guidance based on dietary allergies and goals.

**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.

## TECHNICAL SKILLS

**Java; Python; C; JavaScript** SQL/NoSQL; TensorFlow; PyTorch; OpenCV; Open3D; YOLO; NLP; RAG; Reinforcement Learning; Agentic AI; CV; ROS; Point Clouds; Flask; React; APIs; Git; CI/CD; AWS; Cloud Computing; Distributed Systems; Linux/Unix

## LEADERSHIP & AWARDS

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