Pranav Puttagunta

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Education

University of California San Diego, GPA 3.92, *BS in Computer Science, Minor in Business* Sep 2024 – Present

Experience

Undergraduate Research Assistant, UCSD Advanced Robotics Control Lab – La Jolla, CA Mar. 2025 – Present
- Built motion planning achieving **200%** faster runtime, **10%** gauze savings, and **100%** wound coverage in robotic trials.
- Reconstructed 3D meshes from RGB-D scans with Open3D + SDFs, reaching **80%** accuracy for field medical robotics.
- Implemented MCTS + heuristics, cutting compute by **30%** and enabling near real-time robotic gauze tape application.
- Integrated algorithms into humanoid prototypes, collaborating with researchers on clinical feasibility testing.

Autonomous Systems Developer, Yonder Dynamics – La Jolla, CA Oct. 2024 – Present
- Created traversal routines for a Mars Rover on Jetson/PI, ensuring reliable waypoint completion in URC missions.
- Integrated RTK GPS with Pixhawk, boosting accuracy from **10m → 10cm**, eliminating **30%** navigation failures.
- Built return-to-base fail-safe on ROS heartbeat loss, reducing rover mission failures by **30%** in testing.
- Developed React + ROS dashboards, accelerating debugging and providing real-time operator telemetry insights.

FIRST/VEX Robotics Instructor, Wheelhouse Robotics – Coppell, TX Jun. 2025 – Sep. 2025
- Coached **28** students across **3** VEX teams and **1** FRC team, teaching CAD and Java, Python, Git, CV, and OOP.
- Guided FRC team to make swerve robot in **1** week, vision-based autonomous in **2**, accelerating competition readiness.
- Improved technical collaboration and design reviews by organizing PDRs, debugging sessions, and Git workflows.
- Boosted student outcomes by making hands-on lessons that increased retention and improved competition performance.

Software Engineering Intern, Brains4Drones – Plano, TX Mar. 2022 – Dec. 2024
- Led development of PreCheck LiDAR tool; cut drone mission failures by **60%** through terrain modeling and analysis.
- Built TensorFlow crack detection, automating inspections and reducing manual review time by **50%** for utilities.
- Designed GPU CUDA pipelines with KNN, accelerating point-cloud obstacle detection for safer drone missions.
- Attracted **2** enterprise clients by showcasing PreCheck flight video simulations and REST API-driven planning features.
- Connected React frontend to PreCheck with Google Maps APIs to visualize terrain, safe launch zones, and flight paths.

Projects & Portfolio Highlights

SideKick | *Python, Flask, React, GCP, Firebase, PostgreSQL, Docker* Aug. 2025 – Present
- Building a scalable AI coaching app on GCP, using a PostgreSQL database, React Native, and Redis + Celery.
- Built a REST API powered by an LLM to serve real-time video analysis and personalized feedback with Firebase auth.
- Engineered an OpenCV pipeline for gamified form analysis, integrating engaging ML insights with the UI.

VisLink | *Python, OpenCV, MediaPipe, HCI, Computer Vision, ML* Mar. 2025
- Developed a hackathon-winning HCI system with OpenCV + ML for hands-free desktop navigation for paralyzed users.
- Engineered a low-latency vision pipeline achieving **80%** accuracy in real-time facial signal processing for cursor control.
- Integrated vision controls, blink detection, smoothing algorithms, and speech recognition, boosting tool reliability.

PrepNotch | *React, Flask, AWS, LangChain, MongoDB* Jun. 2025 – Present
- Building a full-stack agentic tutoring system on AWS, featuring a responsive React frontend and a MongoDB database.
- Developed a scalable Flask API using LangChain to automate lessons, quizzes, and generate personalized user feedback.
- Created a custom table of contents-based indexing system which optimized LLM query efficiency for learning materials.

MentalQuest | *React, Flask, MongoDB, Gemini API* Oct. 2024
- Architected a full-stack mental health app with responsive React frontend, a Flask backend, and a MongoDB database.
- Integrated Gemini API to power AI-driven self-care recommendations and interactive user progress tracking features.
- Delivered a gamified user experience with daily quests, journaling, awards, and chatbots, securing 4th place.

Technical Skills

Languages: Python, Java, C, C++, JavaScript/TypeScript, SQL/NoSQL, ROS, Linux, Git/GitHub, Swift, HTML/CSS
Frameworks/Tools: React, Flask, Node.js, TensorFlow, PyTorch, OpenCV, FastAPI, Docker, AWS/GCP, YOLO, CUDA
Specialties: Full-stack development, APIs, Microservices, Machine learning, Computer vision, Robotics perception, Motion planning, Data pipelines, Distributed systems, Algorithm optimization, Agile, CI/CD, Cloud Infrastructure

Honors and Leadership

SacHacks 1st Place • DiamondHacks 1st Place • NASA Moonshot System Lead • FIRST Robotics Team Founder • PURE Nonprofit Chapter Director • Presidential Gold Service Award • National Merit Finalist • Taekwondo National Medalist