

Arsalan Ghogari

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Education

University of Southern California

Aug 2023 - Present

Viterbi School of Engineering, Marshall School of Business

Bachelor of Science, Computer Science/Business Administration; Minor, AI Applications

Study Abroad: University of Bristol, UK | Spring 2026

- **GPA: 3.9; SAT: 1550** (Math 800, EBRW 750); Presidential Scholar (half-tuition merit scholarship), Viterbi Scholar (\$15K/year merit scholarship), Dean's List, W.V.T. Rusch Honors, Thematic Option Honors
- Relevant Coursework: Data Structures & Object-Oriented Design, Algorithms & Theory of Computing, Software Engineering, Principles of Software Development, Discrete Methods, Applied Business Statistics, Business Finance, Operations, Accounting, Micro/Macroeconomics, Linear Algebra; Bristol: AI/ML, Embedded Systems, Strategy
- Seeking part-time software roles Aug 2026 – May 2027; full-time roles beginning Summer 2027

Experience

Software Lead, USC RoboSub (Autonomous Underwater Vehicle Team)

Jan 2025 - Present

- **Promoted 3x in 18 months** (Software Engineer → Perception Lead → Perception & Autonomy Lead → Software Lead); now direct a **5–10 engineer team** owning the AUV's full autonomy stack — vision, SLAM, planning, controls, mission control — for the international RoboSub competition.
- Migrated the team's inherited **10,000+ line ROS 1 codebase** to ROS 2, auditing undocumented legacy nodes and cutting dead code in a full architecture redesign; the vehicle now runs entirely on the new stack.
- More than doubled underwater detection accuracy (**0.40 → 0.90 mAP@50**) by building the annotated dataset and training YOLO and RT-DETR, then compiling ONNX → TensorRT (FP16/INT8) for real-time on-vehicle inference.
- Turned **75 GB of test data across 9 in-water sessions** into decisions: root-caused sluggish surge to a thrust clamp misconfigured at **12 N instead of 30 N**, recovering roughly **40% of top speed**; separately proved the drag model was only **13% off** rather than broken, pulling an unneeded recalibration off the pre-competition critical path.
- Delivered the vehicle's SLAM capability, fusing stereo (ZED) landmarks, IMU, DVL, and depth into a GTSAM factor graph for costmap navigation — validated on rosbag replay against surveyed props to **under 0.3 m absolute error** — and retuned the GPU-parallel MPPI controller (CUDA/C++).
- Built NVIDIA Isaac Sim environments so the full stack is regression-tested closed-loop before scarce in-water time; containerized ROS services (Docker, K3s) for NVIDIA Jetson and Raspberry Pi deployment.
- Partnered with the electrical and mechanical sub-teams to design the AUV's fail-closed safety architecture, co-developing a hardware kill latch (GPIO/Teensy) that holds even if software hangs, a software service gate, supervisor-owned shutdown of the full stack, and an autonomous thermal fail-safe that halts thrusters and sheds inference load until the vehicle recovers.

Director of Digital Strategy, USC Undergraduate Student Government

May 2025 - Present

- Own the digital platform serving USC's **20,000+ undergraduates** and lead a 2–3 person digital team; **re-appointed for a second year** in recognition of technical contributions and impact.
- Made **\$352K in student-government spending** publicly searchable with automated Funding, Senate Bill, and Legislative Project trackers, cutting manual reporting **~95%** across 40+ organizations, committees, and assemblies.
- Identified an unmet student-information need and built **Ask USG**, the organization's AI assistant, now slated for campus-wide launch in Fall 2026 (see Technical Projects).
- Directed an analytics-driven content strategy that grew USG's Instagram following **25%**.
- Manage the official WordPress site and ship front-end features in HTML/CSS/JavaScript, including a dynamic homepage announcement system and interactive election interfaces.

Suicide Prevention Volunteer & Outreach, Didi Hirsch Mental Health Services

Jun 2025 - Present

- Completed **50+ hours** of intensive crisis-intervention training (Jun–Jul 2025); served a weekly suicide-prevention shift through Fall 2025 and volunteered near-daily over winter break, answering **100+ crisis calls**.

- Rejoined after a semester abroad and now serve on the outreach team, expanding community awareness of crisis resources.

Math Peer Mentor, C.E.N.T.R.I.C. Program (USC Viterbi & Dornsife)

Aug 2025 – Dec 2025

- Mentored **5 first-generation and transfer students** in the program's inaugural cohort, coordinating with **30+ professors, advisors, and residential staff** and building the program's application-tracking, mentor-matching, and scheduling workflows.

Technical Projects

Ask USG — Production RAG Chatbot for USC Student Government | Node/Express, Python, OpenAI, Postgres/pgvector, LangGraph, Langfuse, Docker, GitHub Actions

- Built and shipped a production RAG chatbot that auto-discovers and ingests all **97** USG site pages weekly via GitHub Actions (HNSW index, idempotent upserts, zero manual steps); deployed on Render and slated for campus-wide launch to **20,000+ undergraduates** in Fall 2026.
- Raised answer quality **83% → 95%** in one internal beta round with **80+ USG officers and students across 1,100+ questions**, building an automated eval harness (hit-rate, MRR, LLM-judge faithfulness) that lifted retrieval **MRR 0.91 → 0.98** on a 51-question golden set, and fixing retrieval completeness (sibling-chunk expansion), hallucination guards, and live-calendar grounding.
- Cut time-to-first-token **92% (6.2 s → 0.5 s)** via SSE token streaming and eliminating hosting cold starts; tied user feedback scores to per-request Langfuse traces, converting production failures into eval regression tests.
- Extended the system into a **LangGraph** agent routing between knowledge-base retrieval and live data tools (events calendar, project tracker) at **100% tool-selection accuracy (22/22)**; hardened with rate limiting, CORS allowlist, input validation, and CI with an automated eval job.
- Wrote a **30-test suite** proving the mental-health crisis pathway fires across **16 phrasings** and routes to the 988 Lifeline with zero knowledge-base leakage.

Parley — AI Voice Negotiation Agent (solo build) | Next.js, TypeScript, ElevenLabs Agents (WebRTC), GPT-4o, Supabase, Google Places API

- Built solo for the **ElevenLabs × Hack-Nation Global AI Hackathon**: a voice agent that discovers vendors via live Google Places, phones them, extracts itemized quotes into strict JSON, negotiates using competing bids as leverage, and calls the winner back to book — producing a genuine mid-call price drop (**\$2,400 → \$2,250** binding) from leverage the agent gathered, not scripted.
- Engineered dual-voice live calls (ElevenLabs WebRTC agent + TTS counterparty) with deterministic turn-taking — per-turn reply generation and keep-alive pings against agent turn timeouts; domain-agnostic, validated end-to-end across **two verticals** (moving, auto body repair).
- Enforced honesty in code, not prompts: a per-turn tripwire parses every spoken dollar amount (digits and words), validates citations against job-scoped stored quotes, corrects the agent mid-call, and surfaces violations in the UI; **41 CI-gated tests** pin every quote-leakage bug found in development so none can return.

Collaborative Note-Taking Application | Java, XML, Android Studio

- Selected as a **top-2 implementation out of 37 teams** for an original note-map visualization feature; delivered an app **70% faster** than peers via Android Profiler-guided optimization, thread offloading, and database indexing.

Skills

Programming: Python, C++, CUDA, Java, JavaScript, TypeScript, C, MATLAB, HTML/CSS

AI/ML & Robotics: PyTorch (YOLO, RT-DETR), TensorRT, ONNX, ROS 2, GTSAM, NVIDIA Isaac Sim, stereo vision (ZED), Foxglove, rosbag2, OpenAI API, LangGraph, Langfuse, RAG (pgvector)

Web & Infrastructure: React, Next.js, Node/Express, PostgreSQL (pgvector), Supabase, WordPress, Render, Docker, K3s (Kubernetes), GitHub Actions CI/CD, Git, Linux/Bash, embedded deployment (NVIDIA Jetson, I2C/GPIO), unit & integration testing

Analytics & Tools: quantitative benchmarking & data analysis (pandas, NumPy, Langfuse, Foxglove, Excel/Sheets), Git, Google Workspace, MS Office, OnShape, AutoCAD

Interests: weightlifting, weekend group cycling along the Santa Monica coast, underwater robotics competitions, AI hackathons, mental health advocacy