

JOLIE ABADIR

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EDUCATION

Columbia University, Barnard College

New York, NY | Aug 2024 – Dec 2027 (expected)

B.A. Cognitive Science (Embodied Cognition specialization), Minor in Computer Science | GPA 3.52, Dean's List (Spring 2026)

Coursework: Robotics Studio, Machine Intelligence, Natural Language Processing, Biological Image Computing, UI Design, Data Structures

University of Colorado Boulder

Online, concurrent with B.A. | Mar 2026 – May 2028 (planned)

Graduate coursework toward M.S. Electrical & Computer Engineering — Embedded Sensors and Motors pathway

Coursework: Sensors and Sensor Circuit Design, Supervised Learning

RESEARCH & EXPERIENCE

Climbing Movement Dataset — Sensation Labels Aligned to Pose | Project Lead, with Taylor Reed (VP, IRCRA) Oct 2023 – Present

- Began in 2023 as an OpenCV/MediaPipe climbing tracker I built at 16, in my last year of high school ([repo](#)); rebuilt in 2025 as a multi-user labeling platform ([current repo](#), live at collect.dynalytix.net). The VP of the International Rock Climbing Research Association, my advisor since 2023, rejoined in Apr 2026 as co-author on a manuscript in preparation and has shaped the schema through multiple feedback rounds
- Contribution: pose estimation gives kinematics but not what a move felt like. Defined a three-lens taxonomy (environment; strategy as approach × tags × size; outcome) plus a frame-level sensation layer (9 tag types, left/right, 0–10 level, 16 body locations); export joins 33 landmarks, 12 joint angles, velocities, and center of mass to every label, one row per frame
- Built solo: FastAPI on Railway, Supabase Postgres with row-level security, Cloudflare R2, MediaPipe on a serverless GPU worker (Modal); 197 automated tests; infrastructure sized for 20 concurrent labelers. Pilot beginning

Climbing Rehab | Research Intern, under Miguel Zevallos, DPT — hired as a college first-year, ongoing 2025 – Present

- Research support for a clinical practice: 20+ literature reviews and syntheses on climbing biomechanics and injury mechanisms, forming the research basis for Climbing Rehab's published content (blog and social media, including brand collaborations); assist at in-person injury clinic events

TECHNICAL PROJECTS

STEAP | Founder & Lead Engineer

2026 – Present

- Shipped a live multi-user study platform: React front end with tldraw canvas and Apple Pencil support; FastAPI backend with JWT auth; cloud sync across 13 Postgres tables with conflict handling; offline-first IndexedDB; FSRS spaced repetition; Claude API with prompt caching
- Sole software developer; recruited two co-founders to handle business and legal operations

Workshop — Multi-Agent Spatial Perception Framework | Sole Developer

Apr 2026 – Present

- Three-agent system (Builder creates, Owl evaluates, Mechanic corrects) that assembles and self-corrects 3D structures from speech with no model trained on 3D data, using scene-graph geometry, OpenCV three-view triangulation, and Claude Vision
- Traced convergence failures (oscillating rotations, false approvals) to mixed perceptual channels; giving each agent a primary channel (vision or measured geometry) and pivoting to parametric primitives with typed connector ports cut the correction loop from 3 issues to 1 in 2 iterations

ACADEMIC PROJECTS

Automating Context Management in an LLM Dev Workflow | Machine Intelligence final paper, Columbia (A)

Summer 2026

- Analyzed 133 structured build-log entries from STEAP and Workshop to characterize three failure classes (retrieval, staleness, routing); built a prototype comparing manual, lexical-plus-structured, and vector retrieval and assessed each against the documented failures

Senior Thesis — Cognitive Science, Columbia | Mentor: Prof. Joshua Kramer

2026 – 2027

- Predicting what and how a person will grasp from egocentric gaze to pre-shape a simulated robot hand for assistive shared control

ATHLETICS

Elite climber: 10th North American, 14th Pan American Championships (bouldering, 2026) | 3× USCSA All-American snowboarder (rail jam, slopestyle)

SKILLS

Programming: Python, Java, JavaScript/TypeScript, SQL

Vision & ML: OpenCV, MediaPipe, TensorFlow, scikit-learn, Cellpose, scikit-image, Gymnasium (RL), multi-agent LLMs, Claude API

Web & Infra: React, Next.js, FastAPI, Supabase, Postgres, Docker, Railway, Modal, Git | Hardware: CAD (Fusion 360), Raspberry Pi

Languages: English, Arabic (conversational), Mandarin (elementary)