

Ashna Khemani

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Education

Univ. of Pennsylvania — Robotics MSE + Entrepreneurship Minor (May 2027), Mech. Engineering BSE (May 2026)

Cumulative GPA: 3.91/4.00 | Summa Cum Laude, Dean's List

Relevant courses: Machine Perception, Mechatronics, Org. Behavior, Distributed Robo., ML, Controls, Robotics, Dynamics, Thermo, Solids, Machine Design & Mfg, Management, Microecon., Human Systems Eng., Entrepreneurship

Skills

- Object-oriented programming, machine learning, data analysis in Python, Java, C/C++; version control in Git, SVN.
 - System-level design, testing, analysis, and troubleshooting. Electro-mechanical-fluid system integration.
 - CAD, FEA, technical drawings, and prototyping (SolidWorks, machining, 3D printing, laser cutting, silicone moulds).
 - Embedded software, circuits (design, soldering), microcontrollers (Arduino, Raspberry Pi, ESP32, ATmega).
 - Feedback control system design and modeling with MATLAB/Simulink.
 - Leadership, cross-functional coordination. Project management.
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Professional Experience

SpaceX — Falcon 9 Launch Control Intern, Cape Canaveral (May 2026 – August 2026)

- Operate launchpads LC-39A and SLC-40 for daily launch-to-launch pad refurb campaigns.
- Write planning to safely and efficiently diagnose, repair, and test various systems (mechanical, fluid, electronic). Communicate with technicians in real-time to execute planning, manage pad state, and handle off-nominal situations.
- Coordinate operations and assess schedule with system engineers, technicians, other operators, automation, and contractors to ensure that no conflicts or hazards to personnel/infrastructure may arise.
- Examine post-launch data to identify and write ops to address problems (i.e. leaks, faulty instrumentation) across pad.

SpaceX — Falcon 9 Launch Control Intern, Cape Canaveral (May 2025 – August 2025)

- Found and added 2,000+ missing software bounds for electronic components (RTD's, valves, limit switches, etc.) across 3 launchpads via Python scrubber. Scrubber now runs in pre-launch checks before every Falcon launch.
- Mitigated hazards and saved >1hr of high-stakes debugging during vehicle rollout by introducing dashboard monitor that reports missing or extraneous automation runs. Monitor is active from rollout to T-0 for all launches.
- Designed and built launch control GUI for new nitrogen plant at LC-39A; used 24/7 to control and monitor sitewide GN2 supply during launches and daily ops. Built electro/mech/thermo-fluid simulation for plant automation testing.
- Enhanced uniformity and scalability of post-launch pad data review process across all Falcon pads. Previously had to manually update 100+ SQL queries to fetch test data; now need to change 1 YAML line fed to Python script.

SpaceX — Falcon 9 Launch Control Intern, Cape Canaveral (May 2024 – August 2024)

- Reduced post-launch pad safing time by 25% by enhancing automation for pad integrity tests. Achieved year's goal of safely returning personnel to pad within 1hr after a launch.
- Built Python tools to visualize automation timelines and identify bottlenecks in post-launch processes.
- Co-authored FDIR analysis to certify pad SLC-40 for NASA astronauts. Demonstrate redundancy on mech., fluids, electronics, and software on critical systems (rocket strongback/release hydraulics, Dragon climate, Crew Arm).

University of Pennsylvania GRASP Lab — Research Assistant (March 2023 – September 2024)

- Redesigned lab's hexapedal and wheeled robots for lunar exploration as part of NASA's LuSTR project.
- Designed automatic data collection and analysis system to efficiently characterize 100+ soft robot membrane materials. Designed and manufactured test article fixtures. Developed Python-based data analysis program.

LCKR — Product Engineer, Market Researcher (May 2023 – August 2023)

- Conducted market research for early-stage startup using NLP on 50,000+ Penn Buy/Sell/Trade posts and interviewing frequent users.
- Designed initial product; set technical requirements and 3D printed prototype.
- Accelerated launch by initiating partnerships and advertising with 10+ university facilities and student clubs.

Independent Research Project (August 2021 – June 2022)

- Published design of patient-operated physical therapy device in the *Journal of Student Research – High School Edition*. [[Design of a Physical Therapy Device for Lower Leg Recovery](#)]
- Created viable and cost-effective design in CAD using literature on biomechanics and existing technologies.

University of Southern California — SHINE Summer Researcher (June 2021 – August 2021)

- Developed algorithm to calculate optimized, conflict-free trajectories for multi-drone system with 30+ agents.

- Simulated results in Python. Presented and discussed findings at on-campus poster session with 200+ peers, professors, and graduate students present. [[MAPF and Trajectory Optimization with Drones](#)]
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Projects & Leadership

Penn Senior Design Project — aerial-aquatic tailsitter drone

- Designed and built 16in span fixed-wing bicopter VTOL drone. Achieved transition between vertical “copter” mode to horizontal “glider” mode. Structure designed and proofed to maneuver in water as well. [[videos](#)]
- Designed and built airframe using CAD, laser cutters, 3D printers, silicone coatings, and rubber coatings and seals.
- Calculated thrust capabilities and characterized curves for different rotor, propeller, and battery configurations using test stand with 3-axis load cell. Iterated to balance thrust capabilities, battery weight, and propeller footprint.
- Worked with 2 teammates to integrate electronics effectively to maintain stability and tune PID flight controller.
- Set and drove team’s timeline, short vs. long term goals, delegated work, and readjusted when needed.

Penn Junior-Year Final Project — claw machine arcade game

- Built rubber-duck claw machine arcade game for junior year lab final project with 8-member team. System successfully passed rigorous testing from 30+ visiting middle school students. [[video](#)]
- Built 24in x 24in gantry system by repurposing rails and NEMA stepper motors from discarded 3D printer.
- Built custom gamepad in-house using mechanical keyboard switches and 3D printed keycaps.
- Designed and built circuits and coded Arduino board to reliably integrate full mechatronic system (3A 12V gantry motor system, 5V microcontroller, electromagnet “claw,” and gamepad).

Penn High-Powered Rocketry — Mechanical Lead (November 2022 – June 2025)

- Led 7-person mechanical team in airframe manufacture and final integration for 14-ft tall L3 rocket. Used in-house fiberglass layups, 3D prints, and CNC’d structures.
- Coordinated across subteams (avionics, recovery, payload, etc.) to set constraints. Led final integration and assembly.
- Re-founded club post-Covid and led debut at Spaceport 2024 competition. 13-ft L3, 12.5K-ft apogee.

VEX Robotics Team 2075A — Team Captain (August 2017 – May 2022)

- Led team of 4 to place in top 2% of teams worldwide for 5 years. Worlds Division Semifinalist in 2021.
- Researched and implemented PID control to increase autonomous driving accuracy by 75% and shorten drive time by 30% by using sensor data (inertial, ultrasonic, quadrature encoders) in C++. [[video](#)]
- Designed and built various mechanical subsystems (powertrains, 3600rpm flywheel, triple-length linkages) within competition-specified restrictions and limited team budget of \$2,000.
- Volunteered at local, state, and international-level competitions. Refereed matches, managed challenge stations, and resolved disputes that may arise.

Interests: robots in space, robots in medicine, product design, machine learning, economics, swing dancing, piano, live theater.