

Sol Oberoi Mahajan

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Education

- Westwood High School, Austin, TX '23 - Current
SAT: 1560 - Math - 800 / Reading and Writing - 760
Relevant Coursework: Multivariable Calculus. AP Physics C, AP Statistics
- Step By Step School, Noida, UP, India '15 - '23
Relevant Coursework: Cambridge Additional Math (0606)
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Experience

- Founding Engineer, [PlutoRes](#)** June '25 - Current
Started as an intern and promoted as contributions were recognized. Building an agentic AI system for title and escrow that automates title searches.
Built and deployed a production endpoint that returns natural language answers to title queries. Designed a modular agent graph with several nodes such as a topic gate, validator, synthesizer, tool caller, to cut off-topic queries and reduce hallucinations. Provided a main LLM node with segmented API tool calls by parsing title data and returning specific attributes. Roadmap includes integrating Google Docs for indexing docs into vector embeddings for retrieval augmented generation.
Relevant Skills: LangGraph, LlamaIndex (for Retrieval Augmented Generation), REST APIs, Docker, Google Cloud CLI.
- Founder & Lead Instructor, Arduino & Electronics Club (Canyon Vista Middle School)** Sept '24 - Current
Launched a before-school Arduino program to build curiosity and interest in STEM. Currently teaching 28 middle schoolers in the second year of Club and mentoring juniors (future teachers) to build continuity and scale reach.
Conceptualized a [curriculum](#) covering microcontrollers, circuitry, basic C/C++, and data communication protocols.
Relevant Skills: Teaching, curriculum design, sustaining middle schooler's attention, deepening my own fundamentals.
- President, Drone Club, Westwood High School** May '25 - Current
Elected President after serving as Secretary for a year for ~30 members high school club
Provide hands-on experience and access to a wide range of robotics techniques, and methods. Drive sponsorship campaigns to fund expensive hardware components, software and competitions.
Relevant Skills: Drone Anatomy, Fusion 360, basic circuitry, Robot Operating System 2.

Projects

Team Lead, [NASA Human Exploration Rover Challenge](#) Aug '24 - March '25

Spearheaded team of 14 to qualify as 1st Texas public high school in an international NASA contest. Built a human-powered rover designed to traverse lunar/Martian terrain to compete in race week at Space & Rocket Center, Huntsville, AL.

The contest involved multiple deliverables, presentations, STEM engagement and a final race. Deliverables included Proposal, Design Review, and Operational Readiness Review. Extensive documentation and safety checks were required by NASA to not endanger pilots. The rover was fabricated at a local makerspace. Utilized double A arm suspension in the front and back, adapted a steering system from a lawn mover, and built a custom drive train. The rover was tested against multiple systems test and readiness checks before we drove it to Alabama. Raised over \$9000 via [GoFundMe](#) and other resources, social media awareness and STEM engagement camps. Currently mentoring [2026 Team](#).

Relevant Skills: Leadership, CAD, Fusion360, stress simulations, welding, metal work

Research, [Brick Laying Drone](#) Aug '24 - March '25

Motivated by migrant worker deaths in Qatar (~6,500) and construction's ~20% share of workplace fatalities, I solo-built a brick-laying drone to automate masonry

Built a drone using a Pixhawk 4 (Chibi, Ardupilot) and a companion computer RaspberryPi 5. Designed 'the grabber' using a linear actuator mounted below the drone powered via a relay module controlled with a bipolar transistor through PWM from the Pi. Used MAVLINK 2.0 to communicate between the Pi and the Pixhawk. Employed ROS2 for integrating the grabber and modular control of the system. Design achieves a supposed in air <2 cm placement accuracy using native GNSS RTK.

Relevant Skills: Python, C++, CAD, Robot Operating System 2

Team Lead, Seed Dispersing Drone (Drone Club) Aug '25 - Present

Leading 11 person team to design and build an autonomous seed-spraying drone for neighborhood reforestation.

Organized three subteams with defined sub systems: mechanical seed-disperser, avionics/enclosure, autonomy/software. Built ROS 2 packages: mavlink-operator with command/telemetry bridge (arming, modes, waypoint execution, status) and seeder-operator with service to start/stop the disperser and manage rate profiles.

Relevant Skills: Teaching, Leadership, Python, C++, CAD, Robot Operating System 2

Team Lead, Self Driving Car Aug '24 - March '25

Led a 3-person team to design, 3D-print, and program an autonomous car from scratch for the World Robotics Olympiad.

Designed and built a 3D printed RC car from scratch. Coded a custom driver, processing binary to usable data, to integrate a LiDAR with Raspbian. Used computer vision alongside LiDAR position readings to detect obstacles. Utilized Reeds Shepp algorithm to control the car with a real time loop on a Raspberry Pi.

Relevant Skills: Control theory, Python, Reeds Shepp, CAD.

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Team Lead, [Waldo](#):

Aug '25 - Present

An autonomous mobile parts retrieval, classification, and sorting system

Leading a team of 3 in my engineering capstone project to build an autonomous system to find and sort screws under classroom desks. Essentially building a specialized Roomba that given a 3D model can find and sort those objects.

Designing and building circuitry for modular arm replacements for the [LeKiwi Mobile Manipulator](#) (eg. electromagnet). Implementing AprilTag-based + odometry localization.

Training a YOLOv8 computer vision model on synthetic data rendered from CAD models with domain randomization using the data pipeline proposed by [Zhu et al.](#)

Writing a deterministic control script to set up benchmarks against exploratory

Reinforcement Learning & Vision Language Action model policies further in the project.

Relevant Skills: CAD, Reinforcement Learning, Vision Language Action models, Electromagnetic theory

Honors/Awards

Finalist, [International Science & Engineering Fair](#), Ohio

March '25

1st Place & Best of Fair (Top 6 overall) , [Greater Austin Science Fair](#), Austin, TX

February '25

Represented US at [World Robotics Olympiad](#) - Future Engineers, Puerto Rico

Sept '24

1st Place, [Chicago Robotics Invitational Competition](#), Chicago, US

July '24

Top 20 Team (USA), [Kibo Robot Programming Challenge](#)

June '24

Programmed Astrobee, a robot helper on board the International Space Station

Other Activities

Texas Flood Volunteer Clean Up

July '25

Striker, Westwood High School Soccer Team, Austin, TX

Sept '23 - March '24

Right Wing, Cap City Soccer Club, Austin, TX

May '23 - Jan '24

Right Wing, Baichung Bhutia Soccer Club, India

Aug '20 - Feb '23

Volunteer (1A Soccer)

Nov '23
