RAFAE SHAFI

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EDUCATION

Tufts University Set to Graduate May 2027
B.S. Mechanical Engineering | GPA: 3.52 *Medford, MA*
Minors: Engineering Management
- Relevant Coursework: Robotics, Materials & Manufacturing, Aerodynamics, Thermal Fluid Systems, Electronics & Control Systems
- Awards: Dean's List (Spring '24, Fall '24, Spring '25, Fall '25), Academic All-American (2024, 2025)
- Activities: Varsity Swim & Dive, Vice President of Student-Athlete Advisory Committee, E-Racing Team (Exterior Designer), The Hidden Opponent

Nord Anglia International School Dubai May 2023
GCSE's & A-Levels | GPA: 4.0 *Dubai, UAE*
- Honors: Highest Attainment Award 2022–2023, 13 GCSE's, 4 A-Levels & EPQ
- Extracurricular: Cofounder of Student Government (2021–2023), Author of personal blog 'Behind the Block', Captain of Varsity Swim Team

EXPERIENCE

Mechanical Engineering Intern May 2025 – June 2025
W Motors *Dubai, UAE*
- Designed integral components for the GHIATH Police & SWAT vehicles in service with the Dubai Police Force, contributing to the production-spec interior package
- Performed 3D scanning of vehicle bodies and interiors, generating accurate reference geometry used by interior designers across the program
- Conducted quality-control inspections on 10+ SWAT and Police vehicles, flagging defects prior to delivery
- Built and organized a 100+ component Bill of Materials for the GHIATH interior, improving traceability and sourcing workflows

Founder April 2022 – June 2023
Goumbook (NGO) *Dubai, UAE*
- Founded a UAE-based sustainability NGO in partnership with Dubai Municipality, building it from concept to active campaign within one school year
- Launched the 'Save the Cigarette Butts — Waste to Value' campaign at the school level, coordinating logistics, communications, and collection points
- Managed 2 years of scheduling and cross-functional communication across multiple municipal departments and student teams

Assistant to Lead Engineer June 2022 – July 2022
Beeah *Sharjah, UAE*
- Logged key performance indicators into the operations database and supported the Project Manager on daily site activities
- Shadowed the lead engineer on site to develop an in-depth understanding of waste-management operations
- Sourced primary research and field data that informed a 32-page dissertation on sustainability

Engineering Intern, Assistant to Project Manager July 2022 – August 2022
Johnson Controls Arabia *Dubai, UAE*
- Verified live building management system (BMS) data, migrated legacy facility records, and tested smart-office mobile apps

PROJECTS

Poolside WHOOP Heart-Rate Display | Arduino UNO Q, Python, C++, CadQuery, 3D Printing 2026
- Built a standalone display streaming live WHOOP heart rate over BLE to a 3.2" TFT with auto activity/HR-zone detection
- Designed a sealed PETG enclosure (gasketed lid, acrylic window) in CadQuery with scripted collision checks; 33 unit tests

17-0 Showdown — Online NFL Draft Game | React, Vite, Supabase, PostgreSQL, Vercel
- Built and shipped a full-stack browser game where users draft 22 historical NFL players spanning the 1970s–2020s and simulate a full 17-game season; 200,000+ players have logged games since launch.
- Engineered a client-side simulation engine driven by a seeded LCG so every result is deterministic and reproducible from a single integer seed. A full season simulates in under 50 ms with no server-side compute
- Derived player ratings from real historical stats (completion %, yards per attempt, yards per carry, catch rate, coverage grade) and built real-time online multiplayer on Supabase Realtime, using a FOR UPDATE SKIP LOCKED matchmaking RPC to prevent race conditions
- Deployed a React and Vite SPA on Vercel's edge network backed by a single Supabase project (PostgreSQL, PostgREST, Realtime), with row-level security enforcing per-client data access

Autonomous Waffle-Topping Robot — Strawberry Slicer | Python, Raspberry Pi, OpenCV, Airtable 2026
- Built a fully autonomous strawberry-cutting station for a multi-team waffle cafe, coordinating with the Create3 team via Airtable polling to integrate into the wider robotic kitchen
- Designed a dual rack-and-pinion stepper system in PVC channels — first stage feeds the strawberry past a Pi-Camera HSV vision trigger, second stage advances it in precise increments for 5 even slices
- Created the Python control software across two Raspberry Pis, communicating GPIO-to-GPIO between the camera Pi (OpenCV contour detection on green/blue markers) and the cutter Pi for fast, wireless-free triggering
- Drove the build through hardware troubleshooting and tolerance tuning in the final days, achieving reliable operation up to 3 consecutive strawberries during the live cafe demo

Sustainability Dissertation — Waste-to-Value | Field Research, Data Analysis 2023
- Authored a 32-page dissertation on waste-to-value sustainability practices, drawing on field research conducted at Beeah
- Translated operational data into recommendations for school-level sustainability initiatives

LEADERSHIP

Vice President, Student-Athlete Advisory Committee May 2026 – Present
Tufts University *Medford, MA*
- Organize athletic events and homecoming games, coordinating logistics across multiple varsity programs
- Lead the integration of the incoming freshman class into the wider athletic community through structured onboarding initiatives
- Partner with department leadership on key decisions affecting student-athletes across the university

Co-Founder, Student Council September 2021 – June 2023
- Built council structure and set up a communication network with the schools Microsoft Teams interface to relay important information to students about upcoming changes and events
- Created 5 separate committee's tackling different issues in the school recruiting students from various year groups to operate them

SKILLS

Software & Programming: SolidWorks, Onshape, COMSOL Multiphysics, CFD tools, OpenCV, Python, API, LLM, Arduino, Raspberry Pi, SQL, CADQuery
Engineering: Design Analysis, Materials Analysis, Thermal System Designing, Aerodynamic Analysis, Model Training, Control Systems Design