Amira Malik

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EDUCATION

Massachusetts Institute of Technology *Bachelor of Science in Aeronautics & Astronautics* ***May 2023***

FLIGHT EXPERIENCE

- Flight Hours: 60+ Fixed Wing, 2 Aerobatics, 3 Rotary, 300+ flights UAVs
- Types (decreasing): Gliders, SEL Cessnas, Super Cub, Husky, Enstrom 280, Extra 300, Stearman
- Licenses/Ratings: 61 PPL student, 107 sUAS

FLIGHT TEST CAMPAIGNS

REGENT Craft ***May 2023 – Present***

12-Passenger "Seaglider" *(Wing-in-Ground Effect & Foiling Craft)*

- Developed test plan from integration to ground testing to maiden flight to envelope expansion
  - Integration & test progression with schedule, budget, materials/personnel required at each stage
  - Flight Test / "Sea Trials" sequence with tests, schedule, assets, and personnel required

12-Passenger Seaglider Digital Twin

- Implemented & ran tests of the simulated vehicle: automated testing that informs maneuver development
- Analyzed simulator data to refine vehicle models and simulator dynamics; delivered data to stakeholders

UAV Seaglider: 400lb, 15' wingspan

- Directed tests and demos of the wing-in-ground effect and foiling UAV as operator and test director
- Revamped test logistics including checklists, test sequences, brief/debriefs, cross-training, and maintenance

R44 Helicopter *Envelope Expansion & Data Collection*

- Created test plans to evaluate altitude sensors in abnormal vehicle attitudes and high speeds over water
- Executed tests as airborne FTE decreasing altitude and increasing speed outside of the H-V diagram

XWing ***May 2022 – September 2022***

Cessna 208 *Autonomous Landing Controller tuning*

- Monitored traffic and data in tests that tuned the landing controller parameters for flaring and de-crabbing

Cessna 208 *Pursuing an STC for wing-mounted pods*

- Authored a flying qualities test plan: instrumentation, data collection / analysis, and test hazards analysis
- Managed the test vehicle configuration and a team of engineers in hardware integration and instrumentation
- Collected data, monitored traffic, and led briefs/debriefs as airborne flight test engineer

Aurora Flight Sciences ***December 2021 – February 2022***

Optionally Piloted DA42 *Actuator Upgrade*

- Briefed and operated airborne hardware during flight tests; helped install and ground test the DAQ
- Led data analysis to write specs for a new custom actuator; delivered specifications to manufacturer

Beta Technologies ***July 2020 - September 2021***

UAV eVTOL *Maiden VTOL Transition & Envelope Expansion*

- Developed test plans for performance, handling qualities, emergency operation, and software validation
- Primarily test director, also flight test engineer, ground crew, and co-pilot
- Authored an operating handbook, checklists, and training program for a fleet of 10+ sUAS eVTOLs

MIT, various ***May 2021 – May 2023***

Competition Team *Test Pilot & Advisor*

- Planned and flew homebuilt competition drones: placed top ten (100+ teams) multiple years
- Directed flight tests to compare to expected performance; advised the team on critical redesigns

Senior Capstone Project *Chief Engineer & Flight Test Lead*

- Instrumented the aircraft, directed flight tests, and led the data analysis to verify simulated performance

Drone Test Pilot *various research labs*

- Advised on and flew experimental drones researching: medical delivery, hoist dynamics, and autonomy

DESIGN & MANAGEMENT

REGENT Craft *December 2022 – January 2023*

GNC Intern

- Specified and designed control algorithms and autonomous modes from high-level requirements
- Wrote tests to tune controller and investigate operator awareness of autonomous state transitions
- Directed these tests in simulator and flight; analyzed vehicle data to validate controller performance
    - Differential thrust control scheme to improve blown-wing aircraft's low speed maneuverability
    - Demonstrated autonomous modes for waypoint following and loitering

MIT Flight Vehicle Development Capstone Class *September 2022 – May 2023*

Performance Lead

- Optimized target performance of a 72' and 12' wingspan solar electric seaplane
- Developed a 3DOF flight simulation for performance sensitivity analysis of aircraft config & performance
- Iterated fuselage and pylon OML with openFOAM; iterated airfoils and wing planform using xFoil & AVL

Chief Engineer

- Mentored and managed >20 aerospace students in aircraft design, stakeholder design reviews, and build

Beta Technologies *July 2020 – September 2021*

Airframe Project Manager

- Directed a team of 5+ senior and intern engineers to design & manufacture 100+ unique parts for a fleet of 10' 55lb eVTOLs; Supervised, mentored, and prepared their work for design reviews
    - From rough OML to aerodynamic re-surfacing to detailed structure to config freeze in <10 months
- Determined loading and led static / dynamic testing to converge on composite design and mass properties
- Managed a contract manufacturer to deliver airframes: defined acceptance criteria, manufacturing processes
    - With same criteria, reduced product rejection rate from 40% to 0% within two months
- Published the CAD, BOM, assembly, and maintenance manuals for the company: fleet still actively flying

MIT Design / Build / Fly *December 2017 – May 2020*

Member; Lead of Performance & Integration; VP

- Analyzed the stability characteristics and competitive viability of dozens of aircraft configurations
- Coordinated 15+ peers to remove technical roadblocks, deliver systems on schedule, satisfy design criteria
- Led small teams to find analytical and experimental material properties to evaluate composite structures

Technion University Aerospace Faculty *May 2019 – August 2019*

Aeroelasticity Researcher

- Developed, led, and analyzed ground vibration & structural testing of a 10' 3D printed flexible flying wing

PERSONAL PROJECTS

Autonomous Aerobatic Radio-Controlled Airplane *August 2023 – Present*

- An RC plane that can do a full aerobatic competition sequence with no pilot input
    - Development in Simulink; auto-gen C code is re-written to work with Teensy & I2C sensors
    - Flight test is on the horizon: need to develop a MIL simulator to anticipate controller performance

Carbon Fiber Body Repairs *August 2020 - Present*

- Why pay for fiberglass repairs when I've built carbon fiber aircraft?!
- Replaced full-length side panels with carbon fiber and other rust spots: 20,000 miles and still holds!

High School STEM Camp Instructor *June 2018 – December 2021*

- Taught 200+ high school students on aircraft design with a focus on computation and hands-on design

SUBJECTS MATTER EXPERTISE

- **Computation:** Computational Modeling, 3D Surfacing, Data Analysis, SWE / SRS, VLM CFD
- **Fabrication:** Composites Structures, GD&T, Rapid Prototyping, CNC Machining
- **Manufacturing:** Simplistic Design (DFMA), Workflow Management