HAIDER CHAUDHRY

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EDUCATION

The George Washington University **Washington, DC**
Bachelor of Science, Mechanical Engineering, Aerospace Concentration May 2027
Technical GPA: 3.54; **Cumulative GPA:** 3.12
Coursework: Orbital Mechanics & Spacecraft Dynamics; Aerodynamics; Heat Transfer; Fluid Mechanics; Machine Elements

ENGINEERING PROJECTS

Senior Capstone: CubeSat Space Readiness Test Chamber **Sep 2026 – May 2027**
ADCS & Simulation Lead; Test & Safety Lead | Client: GW Micropropulsion & Nanotechnology Lab

- Building a vacuum chamber that measures drag on 1U–3U CubeSat models in simulated 200–300 km orbit, using a heated gas nozzle and a magnetically levitated carriage
- Leading the ADCS simulation redesign; found the old model missed air drag that twists the CubeSat 13× harder than gravity
- Proposed a hybrid control design using the lab's micro-thrusters for roll (15× margin) and magnetorquers for pitch and yaw
- Showed lab drag runs 240–4,200× higher than in orbit, so the model uses measured drag coefficients instead

Self-Pointing Satellite Testbed **Sep 2026 – Present**
Independent Project | MATLAB/Simulink, SolidWorks, ANSYS

- Designing a 0.8 kg satellite model, hung from a nylon line, that turns 90° in 20 s using its own reaction wheel
- Built an error budget showing the original design missed its ±2° goal (2.7°); added feedforward control to reach 1.1°
- Sized the wheel with 4.2× momentum margin and stiffened the frame to a 374 Hz first mode, 2.5× the requirement

3D-Printed Metal Cold Plate for Electronics Cooling **Nov 2026 – Present**
Independent Project | ANSYS Fluent, SolidWorks, Python

- Testing whether a 3D-printed gyroid lattice cools electronics better than machined or printed channels at 50–150 W
- Predicted 0.08–0.09 K/W thermal resistance by hand to benchmark the CFD before any metal is printed
- Caught a test-rig flaw where fitting losses were 25× the plate's own pressure drop; moved the sensors to fix it

Deployable Satellite Solar-Panel Hinge **Nov 2026 – Present**
Independent Project | SolidWorks, ANSYS, MATLAB

- Designing a spring hinge, latch and burn-wire release for a CubeSat solar panel with 173% NASA-STD-5017 torque margin
- Simulated a 0.20 s deployment and 206 N latch impact; every part keeps positive margin across Monte Carlo runs
- Found the original 3 W heater needed 58 s to release the panel vs a 10 s limit; re-specified one that heats in ~0.5 s

EXPERIENCE & ENTREPRENEURSHIP

Black Zero Labs (blackzerolabs.com), Founder **Jun 2026 – Present**

- Founded an engineering-software startup building ~30 connected design tools, including mechanical and electrical CAD, on one shared core; 112 people on the waitlist and raising pre-seed funding
- Leading development of ZeroCAD, a parametric mechanical CAD program with dimension-driven sketches and STEP export
- Built ZeroPlan, a project management system with critical-path and earned-value tracking; preparing for public release

George Washington University, Information Technology **Washington, DC**
Student Technical Support Aug 2024 – Present

- Resolved 300+ hardware, software and network tickets for GW faculty and staff
- Deployed 600 laptops and desktops across GW administrative and executive offices

Black Zero LLC (blackzerollc.com), Co-Founder **Jul 2024 – Present**

- Co-founded a U.S. government contractor with six service lines, from aerospace and logistics to AI/cybersecurity

ADDITIONAL INFORMATION

Software: MATLAB/Simulink/Stateflow; Python; SolidWorks; AutoCAD; ANSYS Mechanical and Fluent; FreeFlyer; STK (familiar)
Analysis: Spacecraft attitude control (quaternions, MEKF, PID, B-dot, thruster modulation); FEA; CFD; GD&T
Fabrication: 3D printing; CNC machining; manual mill and lathe; laser cutting; soldering
Languages & Interests: English (fluent); Urdu (native); building software; soccer; hiking; photography