Mahdy Muratov

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EDUCATION

Stevens Institute of Technology Hoboken, NJ
Bachelor of Engineering, Mechanical Engineering | Minor in Computer Engineering | GPA: 3.94/4.0 Expected May 2028
Honors: Pinnacle Scholar Honors Program; Presidential & Edwin A. Stevens Scholarship; 3x Dean's List; Launchpad@Stevens Fellow
Relevant Coursework: Engineering Design I–III, Design of Dynamical Systems, Circuits & Systems, Thermodynamics

SKILLS

Mechanical Design: SolidWorks, DFM/DFAM, Injection Molding, Spin Welding, Tolerance Analysis, 3D Printing, Rapid Prototyping
Fabrication: Soldering, Manual Knee Mill, Manual Lathe, CNC Waterjet
Analysis/Simulation: CFD, FEA, ANSYS Workbench (Mechanical, Fluent), MATLAB/Simulink
Electronics & Software: Arduino, PLCs, DASYLab, Sensor Integration, Motor/ESC Control, Oscilloscope, Python, C++, Power Apps

PROFESSIONAL EXPERIENCE

Nephros, Inc. South Orange, NJ
R&D Engineer (Full-Time Co-op) *January 2026 – July 2026*

- Developed CAD layouts, drawings, and Bills of Materials (BOMs) for new product development; iterated designs through validation testing, reliability analysis, and Root Cause Analysis under ISO 9001/14001-aligned procedures
- Created preliminary CAD for a new filter product, designing for injection molding and spin welding with full tolerance analysis; design approved to advance toward production
- Designed and built an automated capacity-cycling test rig with PLC-programmed motorized ball valves and overflow/failure safeguards; expired-filter degradation testing requalified $200K+ of written-off inventory for sale
- Wrote and executed validation protocols for a new filter manifold on a purpose-built test rig; redesigned test procedures to improve repeatability and turnaround
- Upgraded heat-cycle test rig with heat-resistant components, new safety measures, and DASYLab data acquisition; overhauled the rig's onboarding protocol, cutting new-engineer training time by >75%
- Reorganized R&D warehouse and built a digital inventory tracking app in Microsoft Power Apps, cutting filter retrieval from 45 to under 2 minutes
- Validated in-house label printing that turned 2-week supplier relabeling delays into 5-minute prints, saving $10,000+/year

SAE Aero Design at Stevens Institute of Technology Hoboken, NJ
Co-founder, Vice President & Director *January 2026 – Present*

- Co-founded Stevens' SAE Aero Design chapter and recruited a 30-member technical team; direct the Chief Engineer and 4 subsystem leads through task assignment and design-review validation
- Drove airframe configuration selection and airfoil optimization for the 2027 SAE Aero Design East Micro-class aircraft; define and validate subteam trade studies and lead the competition design report
- Developing fundraising strategy to cover build and travel costs for the upcoming competition cycle

Advanced Quantum Materials Lab at Stevens Institute of Technology Hoboken, NJ
Undergraduate Researcher in Memristor-based Spiking Neural Networks (SNNs) *April 2025 – August 2025*

- Engineered and simulated memristor-based SNN architectures using PyTorch and Brian2 with precise device-level modeling
- Developed and validated analog memristor crossbar inference for spike-encoded digit classification, with 92.63% accuracy
- Executed performance analysis and system validation using heatmaps and confusion matrices; presented at Stevens Symposium

PROJECTS

Topology-Optimized Unibody Quadcopter September 2025 – December 2025

- Topology-optimized a unibody chassis in ANSYS Mechanical for a 90% mass reduction with DFAM-safe <45° overhangs, then validated a factor of safety of 2 under flight loads via FEA stress analysis
- Designed system architecture: motor layout, MCU/ESC integration, sensor placement, and wiring in a unibody chassis
- Built detailed BOM and hand-calculated analytical models (thrust-to-weight, inertia, stiffness) to guide prototype iterations

Autonomous Racing Airboat January 2025 – May 2025

- Led SolidWorks CAD modeling and performed static stability analysis to meet design goals
- 3D-printed the optimized hull design and engineered modular components to secure a 230g electronics and motor payload
- Designed and built mounting jigs for the dual-fan drive system to improve thrust vectoring and maneuverability
- Integrated an MH-ET control board, IMU, and motor controller with an Arduino, enabling fully autonomous navigation

LEADERSHIP & ACTIVITIES

American Society of Mechanical Engineers Stevens Chapter, Membership Chair March 2026 – Present