

Turibius Rozario

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First-Year Mechanical Engineering PhD Student · US Citizen

Objective

To become the chief advisor for research in renewable energy technologies, mitigating environmental effects, and reversing climate change at the Federal level. To that end, I seek to pursue a PhD in Mechanical Engineering, work with governing bodies, and further bring research to the foreground of policy-making.

Education

Boston University (BU)	Expected May 2030
PhD in Mechanical Engineering (ME)	3.90/4.00 GPA

University of Maryland, Baltimore County (UMBC)	May 2025
BS in ME, Minor in Computer Science (CS)	3.91/4.00 GPA

Audited Courses: Energy Within Environmental Constraints (HarvardX, EdX), Fundamentals of Fluid Power (University of Minnesota, Coursera), Energy Sources for the Future (UMBC).

Skills

Programming Software	C++, HTML / CSS, L ^A T _E X, Mathematica, MATLAB & Simulink, Python
	ArduPilot, COMSOL, GNU/Linux, Inkscape, Keras, OpenCV, OpenIPV, PHREEQC, PyTorch, SolidWorks
Hardware	Arduino, BeagleBone, Raspberry Pi, Sensor Modules
Technical abilities	3D Printing, Hand Lamination, Model Aircraft Pilot, Power Tools, Soldering

Awards & Honors

Student Leadership Award , UMBC	May 2025
VTSI Sustained Research Award , UMBC	October 2023 – May 2024
President's List , UMBC	January 2022 – January 2024
S-STEM Scholar , UMBC	June 2022 – June 2023

Research Experience

Integration of Controls and Neural Networks	November 2021 – January 2025
ME Department, UMBC	
Mentor: Dr. Ankit Goel (ankgoel@umbc.edu)	

- Integrated control techniques with neural networks to improve model prediction for small networks using extended Kalman filters, leading to published paper.
- Manufactured 2D simultaneous localization and mapping platform for future research and coursework.
- Demonstrating finite-time convergence of novel Finite Time Estimation method.

Magnesium Extraction Methods from Seawater	Summer 2024
ME Department, University of Wisconsin, Madison (UW)	
Mentor: Dr. Michael Wagner (mjwagner2@wisc.edu)	

- Compiled existing and novel methods of magnesium salt precipitation and magnesium metal extraction based on technological feasibility, economic viability, and energy expenditure to produce several start-to-finish methods for extracting magnesium sustainably from seawater.

Design of a Hardware-in-the-Loop Test System for Wave Energy Harvesting	Summer 2023
ME Department, University of Minnesota, Twin Cities (UMN)	
Mentor: Dr. James Van de Ven (vandeven@umn.edu)	

- Scaled down full-scale wave energy harvesting system into lab space using fluid flow and energy calculations for hardware-in-the-loop testing.

Publications

Oveissi, P., **Rozario, T.**, and Goel, A. “A Novel Neural Filter to Improve Accuracy of Neural Network Models of Dynamic Systems.” 2025 IEEE Conference on Control Technology and Applications (CCTA), 2025, pp. 705–710. <https://doi.org/10.1109/ccta53793.2025.11151364>.

Rozario, T., Oveissi, P., and Goel, A. “Matrix-Based Representations and Gradient-Free Algorithms for Neural Network Training.” 2024 International Conference on Machine Learning and Applications (ICMLA), 2024, pp. 325–332. <https://doi.org/10.1109/icmla61862.2024.00050>.

Presentations

Undergraduate Research and Career Advancement Day, UMBC April 16, 2025
Abstract title: “UMBC Multidisciplinary Capstone: Design and Development of an Autonomous Fixed-Wing UAV for Long-Range Payload Delivery”.

Summer Undergraduate Research Experience Poster Session, UW July 31, 2024
Poster title: “Magnesium Extraction Methods from Seawater”.

Undergraduate Research and Career Advancement Day, UMBC April 10, 2024
Abstract title: “Modelling Dynamic Systems Using Neural Networks”.

Summer Undergraduate Research Expo, UMN August 10, 2023
Abstract title: “Design of a Lab-Scale Ocean Wave-Powered Desalination System”.

Undergraduate Research and Career Advancement Day, UMBC April 12, 2023
Abstract title: “A Tutorial on Neural Networks and Gradient-free Training”.

Co-curricular Activities

UMBC American Institute of Aeronautics and Astronautics (AIAA),	
<i>External Student Advisor</i>	July 2025 – Present
<i>Student Unmanned Aerial Systems (SUAS) Captain</i>	May 2024 – June 2025
<i>Design, Build, Fly (DBF) Project Lead</i>	May 2023 – May 2025
<i>AIAA Vice-President & SUAS Secretary</i>	May 2023 – May 2024

- Currently advise the SUAS captain and DBF lead in organizational management, engineering design and construction decision making, and ensuring workplace safety.
- Led the DBF team to the international DBF competition, and for the first time in UMBC history, successfully complete a flight mission.
- Led the SUAS team to the international SUAS competition for the very first time in UMBC history, and placed overall 17th out of 81 teams.
- Simultaneously managed a team of 17 members in DBF and 15 members in SUAS, and hosted general events for the UMBC community with 12 to 35 participants in all events.

BU Unmanned Aerial Vehicles (UAV),

<i>Graduate Student Advisor</i>	September 2025 – Present
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- Currently advising club members on a weekly basis on management, funding, and aircraft building.

Student Government Association, *First Year Ambassador* September 2021 – May 2022

- Hosted campus-wide wellness events for over 200 people
- Initiated proposals with university stakeholders for improving campus COVID-resiliency