(Sinchon) Turibius Rozario

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Objective

To pursue a PhD in Mechanical Engineering by exploring studies of performance optimization, process automation, energy conservation, and aeronautical systems.

Education

University of Maryland, Baltimore County (UMBC)	May 2025
BS in Mechanical Engineering (ME), Minor in Computer Science (CS)	3.94 GPA

Courses Audited: Environment within Environmental Constraints (EdX), Fundamentals of Fluid Power (Coursera)

Skills

Languages	C++, HTML / CSS, LaTeX, MATLAB & Simulink, Python
Software	AutoCAD, Betaflight, Inkscape, Keras, PyTorch, SolidWorks, UNIX
Hardware	Arduino, BeagleBone, GPS Modules, Inertial Measurement Units (IMUs), Raspberry Pi
Technical abilities	3D Printing, Hand Lamination, Model Aircraft Pilot, Power Tools, Soldering

Awards & Honors

Meyerhoff Scholar	June 2021 – Present
President's List	January 2021 – Present
Vivien Thomas Scholars Initiative Sustained Research	October 2023 – May 2024
S-STEM Scholar	June 2022 – June 2023
Certificate of Meritorious Service	June 2021
Certificate of Student Engagement	June 2021

Relevant Research Experience

Modelling Dynamic Systems using Neural Networks November 2021 – Present
ME Department, UMBC | Mentor: Dr. Ankit Goel (ankgoel@umbc.edu)

- Training neural networks using MATLAB, TensorFlow, and PyTorch by generating data, using gradient descent, and validating results to model real-world physics.
- Demonstrating finite-time convergence of novel Finite Time Estimation method by fine-tuning hyperparameters.
- Merging extended kalman filtering with neural network models to accurately estimate long-term behavior of dynamic systems.

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

- Used equations for fluid flow and computations on system efficiency and size to scale down the full-scale system into lab space model validation purposes.
- Produced a bill of materials for the exact components needed to construct the system.
- Designed custom parts and fittings for hydraulic components, and drafted an overall assembly model.

Conferences

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

Retriever Robotics, *Team Captain & Treasurer* February 2023 – Present

- Utilized lift, drag, kinematic, and other equations to produce a structural and propulsion system design for a vertical take-off and landing (VTOL) vehicle, capable of travelling 15 miles for 25 minutes while having a gross weight of 12.5 kg.

American Institute of Aeronautics and Astronautics (AIAA), *Project Lead* September 2021 – Present

- Led the Design, Build, Fly (DBF) team to the international DBF competition, and for the first time in UMBC history, successfully complete a flight mission.
- Held numerous campus events where participants designed, built, and flew a drone for their very first time.