NYI NYI AUNG

Website: https://nyinyiaung.com

PERSONAL STATEMENT

Enthusiastic and research-driven graduate with a strong foundation in electrical engineering, eager to contribute to both academic and industrial advancements through postgraduate research. Highly interested in power electronics, AC drives control and autonomous navigation for automotive systems.

EDUCATION

Ph.D. Mechanical Engineering GPA - 4.0/4.0
Louisiana State University A&M, Baton Rouge, USA 01/2025 – To date

M.Sc. Sustainable Transportation and Electrical Power Systems (Erasmus Mundus) GPA - 9.256/10
University of Oviedo, Spain — University of Nottingham, UK — Sapienza University of Rome, Italy 2022 – 2024

- **Master's Thesis:** Optimal Torque Control of Externally Excited Synchronous Motors by Reinforcement Learning

B.E. Electrical Power GPA - 4.4/5.0
Yangon Technological University, Yangon, Myanmar 2012 – 2018

- **Bachelor's Thesis:** Impact of Voltage Dip on System Reliability in Yangon Distribution Network

RESEARCH EXPERIENCE

❑ **Graduate Research Assistant** 01/2025 – To date
Louisiana State University A&M *Baton Rouge, LA, USA*

- **Object Identification and Motion Prediction: A PIRNN + EDMD Approach for UAV Applications**
  - Designed and implemented a Physics-Informed Residual Neural Network (PIRNN) architecture.
  - Developed an encoder–decoder neural network for Extended Dynamic Mode Decomposition (EDMD).
  - Formulated a hybrid loss function integrating data-driven objectives with physics-based regularization.
  - Applied physics-informed classification using softmax-based multi-class confidence estimation.
- **Intelligent PID (iPID) Control and Adaptive Input Shaper Design for Vibration Suppression**
  - Developed an iPID framework extending classical PID principles with explicit elimination of unknown dynamics.
  - Integrated robust input shaping methods to improve precision and minimize residual vibrations.
  - Implemented feedforward control with online parameter estimation for black-box second-order systems.
  - Designed an adaptive optimal input shaper with periodic switch time for enhanced performance.
- **Computer Vision–Based Identification and Tracking of Liquid Metal (LM) Droplets**
  - Designed and built a small-scale 3D printer for LM extrusion experiments.
  - Developed a vibration-integrated substrate mechanism to enhance the extrusion process.
  - Implemented a digital microscopy setup and applied image processing techniques for feature extraction.
  - Identified, tracked, and analyzed droplet dynamics under induced vibration using computer vision methods.
- **Supervised Undergraduate Students in the Lab**
  - Supervised three groups (six students total) on ongoing lab research projects.
  - Held weekly meetings to review progress, provide guidance, and plan subsequent tasks.
  - Involved students as co-authors by guiding their contributions in simulation and experimental replication.

❑ **Graduate Research Assistant – Internship Project** 03/2024 – 09/2024
Paderborn University *Paderborn, Germany*

- **Reinforcement Learning-based Direct Torque Control of Externally Excited Synchronous Motors**
  - Set up a current controller for an Externally Excited Synchronous Motor (EESM) using Reinforcement Learning.
  - Designed a torque controller with constant excitation current for EESM using Reinforcement Learning.
  - Formulated a reward function for the EESM torque controller to balance performance and efficiency.

❑ **Research Trainee** 09/2023 – 02/2024
University of Oviedo *Gijon, Spain*

- **PCB Design and Hardware Deployment for Open-Loop Speed Control of Induction Motor (IM)**
  - Designed integrated circuit schematics for sensor signal adaptation with anti-aliasing filters using LTspice.
  - Developed PCB layouts in Altium Designer, implemented and tested physical system.
  - Deployed auto-generated controller code from Simulink to a microcontroller.
  - Validated system performance on an inverter–PCB–microcontroller–IM setup.
- **Battery Charging through HB-LLC Resonant Converter**
  - Modeled the Li-ion battery and designed the resonant tank circuit.
  - Generated PWM schemes for inductive, resistive, and capacitive switching modes.
  - Designed a PID controller for constant-current and constant-voltage charging.

❑ **Undergraduate Researcher** 03/2017 – 02/2018
Yangon Technological University *Yangon, Myanmar*

- **Effect of Voltage Dip on Sensitive Loads and Countermeasure Methods**
  - Analyzed the impact of voltage dip on system reliability in the Yangon distribution network.
  - Investigated the impact of protection system failures on local electrical distribution system reliability.
  - Highlighted the effect of voltage dip on sensitive loads and proposed countermeasure methods.

PUBLICATIONS

- **N. N. Aung**, N. Muralles, A. Stein, "Object Identification Under Known Dynamics: A PIRNN Approach for UAV Classification," *2025 IEEE International Conference on Machine Learning and Applications (ICMLA)*, Florida, FL, USA. (presented, to appear; acceptance rate: 25%)
- B. Haucke-Korber, **N. N. Aung**, M. Schenke, M. Peña, D. Jakobeit and O. Wallscheid, "Reinforcement Learning-based Direct Torque Control of Externally Excited Synchronous Motors: a Proof of Concept," *2025 IEEE International Electric Machines & Drives Conference (IEMDC)*, Houston, TX, USA, 2025, pp. 916–921, doi: 10.1109/IEMDC60492.2025.11061093.

MANUSCRIPTS UNDER REVIEW

- **N. N. Aung**, B. Wight, A. Stein, "Intelligent PID Control Augmented with Input Shaping for Precision Motion Control in Dynamic Systems," *2026 American Control Conference (ACC)*, New Orleans, LA, USA.
- **N. N. Aung**, B. Wight, A. Stein, "Adaptive Input Shaper Design for Unknown Second-Order Systems with Real-Time Parameter Estimation," *2026 American Control Conference (ACC)*, New Orleans, LA, USA.

PROFESSIONAL MEMBERSHIPS & SERVICES

- **Reviewer:**
  - IEEE Conference on Control Technology and Applications (CCTA) 2025
  - IEEE Transactions on Automation Science and Engineering
  - Optimal Control Applications and Methods
  - American Control Conference (ACC) 2026
  - *ASME* Journal of Vibration and Acoustics

WORK EXPERIENCE

❑ **Graduate Teaching Assistant (Course: Simulation Methods)** 01/2025 – To date
Louisiana State University A&M *Baton Rouge, LA, USA*

- Ensured lab safety compliance and maintained equipment functionality under faculty supervision.
- Assisted in undergraduate courses by grading assignments and exams, and holding office hours for students.
- Substituted for lectures, proctored exams, and supported in-class assessment activities.

❑ **Assistant Electrical Engineer** 04/2019 – 06/2022
Snk (Asia Pacific) Pte. Ltd., *Yangon, Myanmar*

- Designed electrical power distribution and control systems for residential and industrial projects.
- Produced and submitted shop drawings and quantity survey documents to main contractors.
- Conducted inspections for system testing and commissioning.

HONORS & AWARDS

- **Graduate Research Assistantship, Louisiana State University** 2025 – Present
  Awarded a fully funded position to pursue Ph.D. studies in Mechanical Engineering.
- **Erasmus Mundus Joint Master Degree (EMJMD) Scholarship** 2022 – 2024
  Awarded a highly competitive scholarship (less than 3% acceptance rate), receiving a grant of €50,000.
- **Manaaki New Zealand Scholarship** 09/2022
  Awarded a full scholarship to pursue graduate studies at the University of Auckland.
- **Sakura Science Club Member** 06/2018
  Participated in collaborative research with the Power Systems Lab at Kumamoto University, Japan.

TECHNICAL SKILLS

• MATLAB and Simulink • Python • Arduino • LTspice • Altium Designer • FEMM • AutoCAD