

# PHOO PYAE PYAE LINN

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<https://github.com/PhooPyae>

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## EDUCATION

University of Information Technology (Yangon, Myanmar)

*Master of Computer Science, Software Engineering*

2018 - 2019

Thesis - Face Anti-spoofing using Eyes Movement and CNN-based Liveness Detection

Supervisor - Dr. Ei Chaw Htoon

Overall GPA 3.464/4.0; Thesis only 3.67/4.0, Coursework only 3.258/4.0

University of Information Technology (Yangon, Myanmar)

*Bachelor of Computer Science, Software Engineering*

2013 - 2017

Final Year Overall GPA A-

## RESEARCH INTERESTS

Continual Learning, Meta-Learning, Machine Learning, Deep Learning, Reinforcement Learning, Computer Vision

## PUBLICATIONS

P. P. P. Linn and E. C. Htoon, "Face Anti-spoofing using Eyes Movement and CNN-based Liveness Detection," 2019 International Conference on Advanced Information Technologies (ICAIT), Yangon, Myanmar, 2019, pp. 149-154, doi: 10.1109/AITC.2019.8921091.

GitHub: [https://github.com/PhooPyae/machinelearning\\_face\\_antispoofing](https://github.com/PhooPyae/machinelearning_face_antispoofing)

DOI - [Face Anti-spoofing using Eyes Movement and CNN-based Liveness Detection | IEEE Conference Publication](#)

## PRESENTATIONS

Presented the paper entitled "Face Anti-spoofing using Eyes Movement and CNN-based Liveness Detection" at the International Conference on Advanced Information Technologies, 2019.

## PERSONAL RESEARCH

### Expandable Mixture of Experts Transformers

#### Abstract

Existing neural network architectures, such as transformers, are powerful in both language and vision domains. However, truly intelligent models should continuously learn and update throughout their lifetime as they encounter new tasks. A typical solution for such an intelligent model must achieve a balance between stability and plasticity, along with strong generalization to handle variations in data distribution both within an individual task and across different tasks. To enable continual learning in transformer-based architectures, we propose a dynamically

expandable Mixture of Experts (MoE) transformer to enhance both the efficiency and generalization capabilities of transformers. Our proposed method includes a decision-making mechanism, referred to as a controller, which governs the selection of experts. The controller selects experts based on input characteristics or the state of the intermediate representation and is trained using a reinforcement learning algorithm to discover optimal strategies for expert selection. The goal is to expand the transformer architecture in a manner suitable for both unimodal and multimodal tasks while maintaining a balance between model performance and complexity.

## RESEARCH EXPERIENCES

### Peafowl AI

06/2024 - Present

#### Evaluation Metrics and Benchmarking for Low-Resource Languages

- Conducted literature reviews to support the theoretical framework of the research.
- Provided theoretical insights and suggestions to guide the research direction and methodology.
- Contributed to the writing of research papers to ensure rigorous theoretical foundations.

### Codigo (Singapore-based), Yangon, Myanmar

06/2018 - 10/2019

#### *Worked on face anti-spoofing.*

The objective is to prevent spoofing attacks by verifying the liveness of users and contextual information of the images fed to the camera.

- Developed a challenge-response method to verify user liveness and assess the contextual integrity of images, effectively mitigating spoofing attacks.
- Used three different datasets of real and fake images and videos; NUAA, Replay Attack Dataset, and collected data of the organization.
- Proposed a dual-approach system for enhanced security:
  - **Patch-Based Approach:** Utilized Scale-Invariant Feature Transform (SIFT) for robust feature embedding extraction, creating patches of facial features to feed into a neural network.
  - **Depth-Based Approach:** Implemented a neural network leveraging facial depth data, providing a complementary layer of user authentication.
- Led the project from encompassing data acquisition, algorithm development, and comprehensive performance validation.
- Achieved benchmarked success, with significant loss reductions on multiple datasets: 0.102 on NUAA, 0.14 on an in-house dataset, and 0.2 on the Replay Attack dataset, showcasing the effectiveness of the proposed methodologies.

<b>PROFESSIONAL EXPERIENCES</b>	<b>Carro (Trusty Cars Pte Ltd)</b>	Singapore
	<i>Senior Data Scientist I</i>	09/2021 - 07/2024
	<ul style="list-style-type: none"> <li>- Led a PyTorch project using U2Net and Lama inpainting to generate car images, reducing the listing team's workload by 60%.</li> <li>- Gained extensive experience by utilizing MaskRCNN with ResNet101, YOLOv8, Transformer, and ViT for car object detection and segmentation, boosting MAP by 79%.</li> <li>- Developed a ResNet50-based audio classification model for car engine diagnostics, achieving 95% framewise accuracy.</li> <li>- Developed and deployed a predictive model for car pricing across multiple countries.</li> <li>- Collaborated in experiments using LLaMa 7B to fine-tune Q&amp;A models focused on car information</li> </ul>	
	<b>Huawei Cloud APAC</b>	Yangon, Myanmar
	<i>AI Solution Architect</i>	02/2020 - 09/2021
	<ul style="list-style-type: none"> <li>- Engineered business-focused AI solutions.</li> <li>- Deployed client-centric AI/ML systems.</li> <li>- Oversaw machine learning training cycles.</li> <li>- Directed Asia-Pacific Covid-19 AI diagnostics aiding healthcare professionals in Sri Lanka, and Myanmar.</li> <li>- Successfully rolled out OCR, eKYC, and facial recognition projects.</li> </ul>	
<b>LEADERSHIP AND INVOLVEMENT</b>	University of Information Technology, Yangon, Myanmar	
	<i>Student Leader</i>	2014 - 2016
	University of Information Technology, Yangon, Myanmar	
	<i>Advisor of Student Union</i>	2017- 2019
	AI Non-Profit Organization	
	<i>Cofounder</i>	
	<ul style="list-style-type: none"> <li>- Hosted offline and online workshops in universities  <a href="https://www.youtube.com/watch?v=z6fYiwUkbyw">https://www.youtube.com/watch?v=z6fYiwUkbyw</a> </li> </ul>	
	Yangon Data Science Community	
	<i>Core Member &amp; Community Leader</i>	
	<ul style="list-style-type: none"> <li>- Provided training and workshops collaborating with other organizations.</li> </ul>	
<b>ACHIEVEMENTS</b>	Delegate, ASEAN Young Leader Programme by <i>Common Purpose Singapore</i>	2018
	2nd Runner Up, Huawei Cloud and AI Contest by <i>Huawei Cloud</i>	2019
	Proposed Solution - “Smart Decision Support System using Face Recognition”	