Muneeb Nasir

Malaysia muneeb9189@gmail.com (+60) 1156903819 mune98.github.io muneeb-nasir

As a recent Master's graduate, I have developed a strong foundation in artificial intelligence, research, and technology. With my acquired skills, I am fully committed to contributing to cutting-edge research and innovative projects. My goal is to develop and leverage my skillset to solve real-world problems and advance the field of AI. As a highly driven lifelong learner, I am dedicated to continuous growth across all facets and eager to make a positive impact.

Education

Universiti Teknologi PETRONAS (UTP) *July 2021 – June 2024*
MSc in Electrical and Electronics Engineering

- **Mode**: Full-time Research, Graduate Research Assistant sponsored by PETRONAS.
- **Thesis**: "Hyperclass Transformer for RSS-based Indoor Localization with Network Sparsification Methods For Reduced Latency and Storage."

Universiti Teknologi PETRONAS (UTP) *Jan 2017 – Dec 2020*
BEng in Electrical and Electronics Engineering with Honours

- **GPA**: 3.51/4.0 (Second-Upper Class)
- **Thesis**: "Unsupervised Image Segmentation using Deep Neural Networks."
- **Awards**: Sedex Silver FYP Award, Multiple Dean's Lists.

Experience

Graduate Research Assistant *Perak, Malaysia*
UTP–PETRONAS Project *Oct 2021 – Mar 2023*

- Conducted research on indoor localization by developing two novel Transformer-based solutions, which were tested using private and public datasets of RSS-based fingerprinting data. Our approach is 270 times smaller and outperforms PETRONAS's existing solution on their private dataset and other deep learning methods on the public dataset. The project successfully passed the internal PETRONAS Technology Readiness Level 4 assessment and resulted in 1 publication.
- Utilised Microsoft Azure and MLflow to train and track models. Created an Android app with AWS integration (SageMaker, Lambda, API Gateway, DynamoDB) to curate a private dataset, perform real-time inferencing, and test model deployment on the cloud.
- Implemented and validated state-of-the-art pruning methods (Standard Magnitude Pruning, Lottery Ticket Hypothesis, and SynFlow) to reduce the latency and storage demands of the proposed indoor localization solution.
- Assisted in developing a novel sparse orthogonal weight initialization scheme, Sparsity Aware Orthogonalization (SAO), to train deep neural networks (up to 1000 layers) to completion. Applied method on the proposed indoor localization Transformer network.

AI Research Intern *Penang, Malaysia*
ViTrox Technologies Sdn. Bhd. *Sep 2019 – April 2020*

- Researched unsupervised semantic segmentation using invariant information clustering and generative adversarial networks (GauGAN) coupled with neural style transfer to generate a synthetic and semi-realistic image dataset of integrated circuits.
- Performed optimization and benchmarked pre-trained models from different deep learning frameworks-TensorRT, ONNX, PyTorch, and TensorFlow.

Undergraduate Research Assistant *Perak, Malaysia*
UTP *Aug 2018 – Aug 2019*

- Supervised by Dr. Eric Ho Tatt Wei, explored neuroimaging through probabilistic models and computer vision. Trained Variational AutoEncoders to reconstruct 2D brain scans using TensorFlow.

Publications

- Nasir, M., Esguerra, K., Faye, I., Tang, T. B., Yahya, M., Tumian, A., & Ho, E. T. W. (2024). HyTra: Hyperclass Transformer for WiFi Fingerprinting-based Indoor Localization. Transactions on Energy Systems and Engineering Applications, vol 5(1), pp 1–24.
- Esguerra, K., Nasir, M., Tang, T. B., Tumian, A., Ho, E. T. W. (2023). Sparsity Aware Orthogonal Initialization of Deep Neural Networks. IEEE Access, vol. 11, pp. 74165-74181.

Projects

Undergraduate Final Year Project *May 2020 - Dec 2020*

- Leveraged representational learning to accomplish self-supervised image segmentation based on the state-of-the-art self-supervised classification (SimCLR) and popular image segmentation architecture, U-Net. The proposed segmentation model was successfully trained and tested on a self-generated synthetic 2D and 3D shapes dataset, as well as the STL-10 image recognition public dataset. The project was awarded the SEDEX Silver FYP award.

Integrated Systems Design Project *May 2020 - Dec 2020*

- Led a team of three electrical engineering students tasked with designing a robot that manoeuvres around an obstacle course to reach its destination, where it would monitor and control the temperature of a closed system at a set point.
- I worked on robot navigation (training YOLOv4 for obstacle detection and syncing with ESP32 for path planning), integrated all subsystems, and designed and hosted a website on a local server (using Flask) to transmit live video and temperature readings from the robot.

Engineering Team Project *Jan 2019 - Mar 2019*

- Led a team of engineering students from non-EE backgrounds with no experience in deep learning to create an assistive device for the visually impaired within eight weeks.
- The device employed object detection (YOLOv3 trained using Tensorflow) to identify objects in a scene; the user is then guided to the desired object by simple directions (left, right, forward, and backward) via speech. The object detection algorithm was deployed on a Raspberry Pi harnessed to a user's chest, and the video with predictions was live-streamed to a laptop for validation.

Technologies

Programming: Python, C, MATLAB, HTML/CSS

Machine Learning & Data Visualisation: Pytorch, Pytorch-Lightning, TensorFlow, Numpy, Pandas, Matplotlib, Plotly

Cloud & Web Technologies: Azure Machine Learning, AWS (SageMaker, EC2, API Gateway, Lambda), Flask, REST, Docker, Kubernetes, Git

Certificates, Courses, and Tutoring

Professional Certificates

- Certified Graduate Engineer from the Board of Engineers Malaysia (BEM).

Courses

- Online Courses (Coursera): Andrew Ng's Deep Learning Specialisation, Daphne Koller's Probabilistic Graphical Models
- UTP Courses: Probability & Random Processes, Vector Calculus, Differential Equations, Numerical Meth-

ods, Digital Signal Processing, Computer Systems Architecture, Microcontrollers

- Self-Study: Linear Algebra, Python, Computer Vision, Machine Learning, Deep Learning, Natural Language Processing

Tutoring

- Tutored foundation mathematics (Calculus) during Master's.
- Curated deep learning coding tutorials for the MSc Intelligent Systems course.

Interests

Martial Arts, Sports, Cooking, Videogames, Reading, Philosophy and Religion, Cinematography, Travel