Juyoung Oh

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EDUCATION

Korea University   **Expected Graduation Date:** Feb. 2026
Bachelor of Computer Science

The University of Nottingham   **Expected Graduation Date:** July 20
Bachelor of Computer Science   UK grade: 67/100 (Second First, Division One)
                                                        US grade: 3.7/4.0

Publications

FIQ: Fundamental Question Generation with the Integration of Question Embeddings for Video Question Answering
Ju-Young Oh, Ho-Joong Kim, and Seong-Whan Lee,
SMC 2025

An ANN-Assisted Control for the Power Decoupling of a Multiple Active Bridge DC-DC Converter
Giampaolo Buticchi, Amin Farjudian, **Juyoung Oh**, Luca Tarisciotti**,**
IECON 2022

RESEARCH EXPERIENCE

FIQ: Fundamental Question Generation with the Integration of Question Embeddings for Video Question Answering   September 2024 – May 2025
- Identified key limitations of Vision-Language Models (VLMs) in the traffic video question answering (VQA) task, particularly in interpreting complex scene context, and improved model accuracy from 46% to 48%.
- Generated foundational question-answer pairs to enhance comprehensive video understanding and developed a cross-attention-based method to incorporate task-specific information effectively.
- Developed a novel cross-attention mechanism that integrates question embeddings with temporal and spatial video features, enabling more task-specific information extraction.
- Leveraged the CLIP model to encode visual features from raw traffic video data, allowing for fine-grained semantic representation of frames and improving multimodal alignment.
- Incorporated advanced language models such as GPT-4o-mini and T5 to synthesize context-aware question-answer pairs, automating the QA generation pipeline.

An ANN-Assisted Control for the Power Decoupling of a Multiple Active Bridge DC-DC Converter   September 2022 – May 2023
- Explored function inversion using neural networks in the context of low-power embedded systems, building a foundation in model design and implementation.
- Utilized a neural network (Multi-Layer Perceptron) to achieve optimal trade-off between computational efficiency and accuracy in embedded system function inversion tasks.
- Analyzed the performance of neural and linearized models across input domains, gaining practical insight into hybrid modeling strategies.
- The experience in neural network architecture and evaluation later supported the development of multimodal models for video question answering tasks.

Final Year Dissertation- Computational Power of Neural Networks (Passed with First Class)
September 2022 – May 2023
- Studying function inversion using neural networks in the context of low power embedded systems.
- Conducted a **comparative analysis** of the **energy efficiency** of neural networks in relation to **CPU processing time**, with other function inversion algorithms, Newton method and Bisection method. Faster CPU processing time indicates higher computational efficiency.
- Developed MultiLayer Perceptron (MLP) to reduce CPU time. Additionally, established threshold of Newton method and Bisection method based on the neural network's error rate for fair stopping criteria.
- The experiment result shows that MLP demonstrates faster CPU time as the complexity of the function increases. In contrast, the Newton method and the Bisection method exhibit faster CPU time when applied to simpler functions.
- Employed Python libraries: Tensorflow, numpy and pandas libraries.
- Supervisor: Amin Farjudian

Group Project- Cultural Heritage Center: Soul jars   **(Passed with First Class)**
October 2021– June 2022
- Collaborated with the University of Nottingham and Ningbo Museum on a project to digitally preserve Song dynasty Chinese soul jars using laser scanning.
- As a **team leader**, managed project timeline, equipment, and stakeholder communication to meet quality and quantity requirements. Also recruited and supervised interns to ensure project goals are met.
- As an **engineer**, developed a comprehensive user manual for 3D model modification for training interns and conduct training sessions on 3D model modification software Artec Studio 16 and Spider laser scanner.
- Supervisor: Dave Towey

SKILLS

Software Tool Skills:
Python
JAVA
C++
C
Pytorch,
Tensorflow
Artec Studio 16
Android programming (JAVA based)
Language:
Korean (Native)
English (Professional Working proficiency)