Punnawish KK Thuwajit

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Education

University of Wisconsin Madison, Expected Graduation 2025 (Madison, WI, USA) 2022 – 2025 (EST.)
GPA: 4.00 (Dean's List) BS in Computer Science and Mathematics Double Major:

- CS639 (Deep Learning in Computer Vision)
- CS839 (Graduate Generative AI)
- CS760 (Graduate Machine Learning)
- CS544 (Big Data Systems)
- MATH632 (Stochastic Processes)
- MATH431 (Probability Theory)

Technologies

- **Languages:** Python, Java, JavaScript, TypeScript, Bash, HTML, CSS, LaTeX
- **Machine/Deep Learning:** (Development) PyTorch, TensorFlow, Scikit-Learn (Deployment) Streamlit, Flask, Ngrok
- **Data Science:** (Analysis) NumPy, SciPy, Pandas (Visualization) Matplotlib, Plotly, Seaborn
- **Databases:** PySpark, Cassandra, Hadoop Ecosystem, Kafka, Docker, MySQL

Personal Projects

GANime - Unsupervised and Controllable Generation of Anime Faces
[PyTorch, NumPy] Constructed a custom VAE-GAN for image generation and customization without manual labels

Unofficial Implementation of UNIT-DDPM (Image-to-image Translation with Diffusion Models)
[PyTorch, NumPy] Followed the mathematical equations used in the paper and translated into a PyTorch model

Kuroma.dev (Personal Portfolio Website)
[Next.js, TypeScript, TailwindCSS] Created an informative website with interactive elements using the Next.js framework

Work/Research Experiences

Computer Vision Lab, Computer Science, UW-Madison, (Madison, WI, USA) **2023 – Present**
Position: Lab Team Member

- Currently researching the improvement of specific-object generation via diffusion models
- Currently working on real-time audio-condition lip syncing

Waisman Center, UW-Madison (Madison, WI, USA) **2022 – Present**
Position: Undergraduate Researcher

- Developed a denoising algorithm to convert fast and noisy (1-2 minutes) MRI scans into meaningful brain images.
- Learned a practical implementation of parallel training of large deep learning models

NXPO (Higher Education Science Research Policy Council) (Bangkok, Thailand) **2021 – 2022**
Position: AI Engineer Intern

- Analyzed over 1 million publications to determine weak signals of growing fields in research for policy construction.

Computer Engineering, Chulalongkorn University (Bangkok, Thailand) **2021 – 2022**
Position: AI Engineer Intern

- Developed a full-stack application for schistocyte detection and enumeration from blood smear images of anemia patients.

Vidyasirimedhi Institute of Science and Technology (VISTEC) (Rayong, Thailand) **2020 – 2023**
Position: Lab Team Member and Research Intern

- Developed a fast and accurate algorithm for seizure detection via EEG signals for epilepsy diagnosis.
- Developed a novel algorithm for respiratory rate estimation via wearable PPG signals for real-time monitoring.

Selected Publications

- Osathitporn, P., Sawadwuthikul, G., **Thuwajit, P.**, Ueafuea, K., Mateepithaktham, T., Kunaseth, N., ... & Wilaiprasitporn, T. (2023). RRWaveNet: A Compact End-to-End Multi-Scale Residual CNN for Robust PPG Respiratory Rate Estimation. *IEEE Internet of Things Journal*. **(Co-corresponding Author)**
- **Thuwajit, P.**, Rangpong, P., Sawangjai, P., Autthasan, P., Chaisaen, R., Banluesombatkul, N., ... & Wilaiprasitporn, T. (2021). EEGWaveNet: Multiscale CNN-based spatiotemporal feature extraction for EEG seizure detection. *IEEE Transactions on Industrial Informatics, 18(8)*, 5547-5557.

Awards and Certifications

- **TensorFlow Certificate for Machine Learning Development:** awarded for fluency in the framework.
- **Regeneron ISEF 2022 Finalist:** International Science and Engineering Fair (Atlanta, GA, USA)
- **Mathematics Olympiad:** Thailand Mathematics Olympiad gold medalist, qualified for IMO team selection camp.