Punnawish Thuwajit

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Education

University of Wisconsin Madison, Class of 2026 (Madison, WI, USA) **2022 – Present**

GPA: 4.00 Computer Sciences and Mathematics Majors, related coursework includes:

- CS639 (Deep Learning in Computer Vision)
- CS400 (Programming III)
- MATH376 (Multivariable Calc & Differential Eq.)
- MATH375 (Multivariable Calc & Linear Algebra)

Suankularb Wittayalai School (Bangkok, Thailand) **2016 – 2022**

GPA: 4.00 Graduated Valedictorian

Technologies

- **Languages:** Python, Java, JavaScript, Bash, HTML, CSS, LaTeX
- **Machine/Deep Learning:** (Development) PyTorch, TensorFlow, SK-Learn (Deployment) Streamlit, Flask, Ngrok
- **Data Sciences:** (Analysis) NumPy, SciPy, Pandas (Visualization) Matplotlib, Plotly, Seaborn

Work Experiences

Waisman Center, UW-Madison (Madison, WI, USA) **2022 – Present**

Team Member and Research Intern: Undergraduate Student

- Currently working on denoising fast and noisy (1-2 minutes) MRI scans into meaningful brain images

Faculty of Medicine Siriraj Hospital, Mahidol University (Bangkok, Thailand) **2022 – Present**

Post-hackathon Collaboration

- Currently working on implementing a real-time in ward blood pressure (along with other vital signs) monitoring for hypertension, cardiovascular disease, and myocardial infarction patients
- Planned to extend into an AI-in-medicine service under the name "RuOK - Make Sure They are OK"

NXPO (Higher Education Science Research Policy Council) (Bangkok, Thailand) **2021 – 2022**

Intern: AI Engineer

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

Department of Computer Engineering, Chulalongkorn University (Bangkok, Thailand) **2021 – 2022**

Intern: AI Engineer

- 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 – Present**

Team Member and Research Intern: Undergraduate (formerly High-school) Student

- Developed a fast and accurate algorithm for seizure detection via EEG signals for epilepsy diagnosis.
- Developed a novel algoritm for respiratory rate estimation via variable PPG signals for real-time monitoring.
- Currently working on an algorithm for real time sleep-staging and sleep disorder analysis via variable PPG signals.

Publications

- Osathitporn, P., Sawadwuthikul, G., **Thuwajit, P.**, Ueafuea, K., Mateepithaktham, T., Kunaseth, N., ... & Wilaiprasitporn, T. (2022). RRWaveNet: A Compact End-to-End Multi-Scale Residual CNN for Robust PPG Respiratory Rate Estimation. *arXiv preprint arXiv:2208.08672*. **(Co-corresponging 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)
- **First and Second Hackathon Awards:** for medical innovation hackathons hosted by the Faculty of Medicines Siriraj and Ramathibodi Hospitals, Mahidol University.
- **Mathematics Olympiad:** Thailand Mathematics Olympiad gold medalist, IMO team selection camp attendee.

Additional Skills

- **Bilingialism:** English (Proficient), Thai (Native)
- **Origami Artist**: designer and folder. Combined mathematical concepts into designing new models.

Reference Persons

- **Assist. Prof. Theerawit Wilaiprasitporn, PhD (VISTEC, Rayong, Thailand):** theerawit.w@vistec.ac.th
- **Steven Kecskemeti, PhD (Medical Physics, UW-Madison, WI, USA):** kecskemeti@wisc.edu