Guntitat Sawadwuthikul

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EDUCATION

Korea Advanced Institute of Science and Technology — Daejeon, Korea
B.Sc. (Hons) Computer Science, Electrical Engineering, and AI (Summa Cum Laude, GPA: 4.06/4.30) — August 2019 - February 2023

Kamnoetvidya Science Academy — Rayong, Thailand
High School Diploma (GPA: 4.00/4.00) — May 2016 - February 2019

EXPERIENCES

Gauss Labs — Seoul, South Korea
Applied Scientist — March 2023 - Current

- Build regression model on online streaming data to solve virtual metrology in semiconductor manufacturing using online convex optimization and deep learning.
- Speed up the training and inference time of online model by 2 - 5 times with preserved prediction accuracy using pruning technique.
- Maintain in-house Python machine learning repository for model development and benchmark with >85% test coverage.
- Implement tooling and visualization dashboard using for large-scale model orchestration and production monitoring over thousands of datasets and models using Ray, MLflow, Streamlit, and Apache Beam which significantly improve the team's productivity with automation.
- Integrate continuous development cycle on AWS with Helm and GitHub Actions for in-house softwares and Python packages.

Sense AI — Remote, Thailand (Part-time)
Research Engineer — April 2023 - September 2023

- Published two peer-reviewed research papers in top IEEE journal and conference (IEEE IOTJ and SSP) on sleep study and sleep apnea detection.
- Productized B-Sense, a personalized AI-driven home-used sleep apnea sensing leading to its first launch.

Vidyasirimedhi Institute of Science and Technology — Rayong, Thailand
Research Assistant — April 2019 - June 2019, March 2022 - October 2023

- Published two papers in IEEE TII and IOTJ (impact factor >10).
- Developed a human-robot interaction framework which helped the robot locate human target efficiently by applying human-in-the-loop optimization, active learning, and computer vision.
- Published an effective deep neural architecture using deep convolutional network to extract breathing rate from PPG signal with <2 breath per minute error.

Siam Commercial Bank — Bangkok, Thailand
Data Scientist Intern — June 2022 - August 2022

- Developed a new reject inference algorithm for the bank by extending state-of-the-art research in deep semi-supervised learning to using LightGBM on tabular data, doubling the F1 score. The approach was later deployed as the bank's product.
- Documented valuable tools that can be used to track ML experiments such as TensorBoard, DataBricks widgets, and custom loss in LGBM models for the team's reproducibility.

Institute for Basic Science — Daejeon, Korea
Research Intern — December 2021 - August 2022

- Conducted experiments on deep residual neural network to solve climate downscaling super-resolution tasks. The work was published in SIGKDD 2022.

Publications

Special markers: * = first author

[1] Choksatchawathi, T.*, **Sawadwuthikul, G.***, Thuwajit, P., Kaewlee, T., Mateepithaktham, T., Saisaard, S., Sudhawiyangkul, T., Chaitusaney, B., Saengmolee, W., Wilaiprasitporn, T. (2024). "ApSense: Data-Driven Algorithm in PPG-Based Sleep Apnea Sensing". In IEEE Internet of Things Journal. [paper]

[2] T. Choksatchawathi*, T. Kaewlee, **G. Sawadwuthikul**, B. Chaitusaney, N. Jaimchariyatam, T. Wilaiprasitporn, T. Sudhawiyangkul. "An Extended System for External Sensors Data Acquisition and Validation During Conducting Polysomnography". In: *2023 IEEE Statistical Signal Processing Workshop (SSP)* (2023), pp. 656-660. [paper]

[3] S. Dash*, P. Gajbhiye, P. Sawangjai, **G. Sawadwuthikul**, T. Sudhawiyangkul, R. K. Tripathy, R. B. Pachori. "Dyadic boundary points based empirical wavelet transform for the elimination of eye movement and eye blink-based ocular artifacts from EEG signals". In: *Biomedical Signal Processing and Control* 85 (2023), pp. 104996. [paper]

[4] P. Osathitporn*, **G. Sawadwuthikul***, P. Thuwajit, K. Ueafuea, T. Mateepithaktham, N. Kunaseth, T. Choksatchawathi, P. Punyabukkana, E. Mignot, and T. Wilaiprasitporn. "RRWaveNet: A Compact End-to-End Multi-Scale Residual CNN for Robust PPG Respiratory Rate Estimation". In: *IEEE Internet of Things Journal* (2023). [paper] [code]

[5] **G. Sawadwuthikul***, T. Tothong, T. Lodkaew, P. Soisudarat, S. Nutanong, P. Manoonpong, and N. Dilokthanakul. "Visual Goal Human-Robot Communication Framework With Few-Shot Learning: A Case Study in Robot Waiter System". In: *IEEE Transactions on Industrial Informatics* 18.3 (2022), pp. 1883–1891. [paper]

Honors and Awards

- (2023) Summa Cum Laude and Outstanding Graduate (top 7% by GPA) of 2022 - 2023, KAIST
- (2022) KAIPlus Scholarship Award, KAIST
- (2022) 2x Dean's List of College of Engineering, KAIST (Spring, Fall 2022)
- (2021) Creativity Prize, Thailand Machine Learning for Chemistry Competition (TMLCC)
- (2021) Most Human-Centered Award, CS374 Design Project, KAIST
- (2019) Class Valedictorian, Kamnoetvidya Science Academy
- (2018) Champion Team Award, American Regions Mathematics League Local Thailand
- (2018) Honorable Mention, International Mathematical Modeling Challenge

Community Services

- Journal reviewer: Biomedical Signal Processing and Control, IEEE Transactions on Industrial Informatics, IEEE Sensors Journal
- Social enterprise for education: Saturday School, The White Room Enterprise