TEERAPONG PANBOONYUEN (KAO)

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All about me 🌐 **Website:** `https://kaopanboonyuen.github.io`

RESEARCH INTERESTS

- Human-AI Interaction; Computer Vision; Learning Representations; Large Language Models (LLMs); Diffusion Models

- **Tech Toolkit:** Python; PyTorch; TensorFlow; GCP; AWS; GPT; HuggingFace; GenerativeAI; Git; API; Swagger UI

EDUCATION

Postdoctoral Visiting Scholar in AI for Earth and Social Good　　　　　　　　*2022 - Present*
Chulalongkorn University
Research Topic: Land Use and Land Cover Classification through a Self-Supervised Learning Approach with Vision Transformers
(Published a paper in a top-tier, Q1 journal)

Postdoctoral Researcher in AI　　　　　　　　*2021 - 2022*
Chulalongkorn University
Research Topic: Semantic Labeling in Remote Sensing Datasets through Knowledge Distillation and Self-Attention Mechanisms
(Published a paper in a top-tier, Q1 journal)

Ph.D. in Computer Engineering　　　　　　　　*2017 - 2020*
Chulalongkorn University (GPA: 4.00/4.00)
Dissertation Title: Tackling Multi-Class Semantic Segmentation on Remote Sensing Data using a Deep Encoder-Decoder Model
Thesis Evaluation: Very Good Score (Outstanding Achievement)

M.Eng. in Computer Engineering　　　　　　　　*2015 - 2016*
Chulalongkorn University (GPA: 4.00/4.00)
Thesis Title: Semantic Road Segmentation on Remotely-Sensed Images Using Deep Neural Networks and Landscape Metrics
Thesis Evaluation: Very Good Score (Outstanding Achievement)

B.Eng. in Computer Engineering　　　　　　　　*2012 - 2015*
KMUTNB (Top 5 Student Admission Quota)
Thesis Title: Lumbar Spinal Canal Stenosis Classification (Thesis Evaluation: Grade A)

Pre-Engineering School in Pre-Electrical Engineering (PET21)　　　　　　　　*2010 - 2012*
KMUTNB (Senior High School: 10th - 12th Grade)

PROFESSIONAL EXPERIENCE

Senior Research Scientist | Motor AI Recognition Solution (MARS)　　　　　　　　*Jan 2022 - Present*

- Pioneered the development of the **MARS** AI model: **M**ask **A**ttention **R**efinement with **S**equential Quadtree Nodes, showcased at ICIAP 2023 in Udine, Italy, and featured in the conference proceedings.

- Initiate and drive new research projects involving AI model development for tasks such as Image Classification, Object Detection, Instance Segmentation, and Explainable AI (XAI). Focus on creating, reproducing, and validating cutting-edge solutions for the auto insurance sector.

- Facilitate the integration of pre-trained models into production by providing APIs for frontend and backend service teams, enhancing car insurance and garage-related operations.

- Explore and create novel models with potential to challenge and redefine existing design paradigms, drawing from top research databases like CVPR, ICLR, ICCV, ECCV, NeurIPS, and PAMI.

- Architect and deploy advanced deep learning solutions for autonomous systems, making significant contributions to the development of self-driving cars, drones, and robotics.

- Develop innovative Semantic Distillation and NLP frameworks using deep learning techniques, revolutionizing language understanding and generating applications with a transformative impact.

- Lead research efforts in creating and authoring influential papers, actively submitting to high-impact journals and conferences, and contributing to the advancement of AI technologies.

Visiting Faculty | College of Computing, Khon Kaen University *June 2023 - Present*

- Deliver lectures in the following courses:

    - **SC310005 Artificial Intelligence and Machine Learning Application**: Covering foundational AI and ML concepts along with their practical applications.

    - **CP020002 Smart Process Management**: Focusing on strategies for optimizing and automating business processes.

    - **SC320002 Business Intelligence**: Teaching techniques for data analysis and decision-making in business contexts.

    - **CP020001 Introduction to Computers and Programming**: Introducing students to computer systems and fundamental programming skills.

- Develop and refine course materials, including syllabi, assignments, and assessments, to ensure a comprehensive educational experience in each subject.

- Contributed to the academic community through the Ministerial Order on the Appointment of Academic Staff **(Order 5907-2566)** and received two Invitation Letters for Special Lecturer Positions **(Orders 660301.26/24844 and 660101.26/13320)**.

Dept. of Survey Engineering | Chulalongkorn University *July 2022 - Present*

- My postdoc research focused on designing and providing an alternative perspective by treating LULC as a sequence-to-sequence prediction task on remote sensing corpora.

- Supervisors: Chalermchon Satirapod and Chaiyut Charoenphon

AI Research Scientist (Department Manager) | CJ Express Group and CJ Express Tech (TILDI) *Nov 2020 - Aug 2021*

- Apply Data Science and AI technology (PySpark, Deep Learning) in Barter for Demand Forecasting in Retail Grocery Stores.

- Working as Artificial Intelligence Researcher with Machine Learning, Big Data Solutions; Hadoop, PySpark for Demand Forecasting Project via Data Innovation Team.

- Fine-Grained Time Series Forecasting at Scale with PySpark, Deep Learning, and Visualizing Demand Seasonality.

- Artificial Intelligence Research Scientist (Department Manager), C.J. Express Group Co., Ltd., Office Silom

Dept. of Computer Engineering | Chulalongkorn University *Sep 2015 - Apr 2022*
Postdoctoral Researcher, Ph.D./M.Eng. Candidate
- I focus on designing deep encoder-decoder networks for semantic segmentation of satellite imagery. My passion is at the intersection of Remote Sensing, Computer Vision, and Machine Learning. Proud member of the Machine Intelligence and Knowledge Discovery Lab (MIND Lab).

- My PostDoc Research (Full Paper, 2021): https://www.mdpi.com/2072-4292/13/24/5100

- My Publication Dissertation (Full Text, 2020): http://cuir.car.chula.ac.th/handle/123456789/70297

- My Publication Thesis (Full Text, 2016): http://cuir.car.chula.ac.th/handle/123456789/55593

- Supervisors: Peerapon Vateekul and Siam Lawawirojwong

Graduate Teaching Assistant | Chulalongkorn University *Sep 2015 - Apr 2022*
Co-taught the annual machine learning course for undergrads and grads.
- Updated the syllabus to feature hands-on Python programming experience.

- 2140101 Computer Programming (Java, ISE, Chulalongkorn University)

- 2110101 Computer Programming (Python, 1st year bachelor of Faculty of Engineering)

- 2110627 Big Data Tools (Master Student)

- 2110446 Data Science and Data Engineering (3rd-year bachelor of Computer Engineering)

- (Online Course, Head TA) Intro to Data Analytics and Big Data (https://mooc.chula.ac.th)

- (Online Course, Head TA) Practical Data Analytics Using Rapid Miner (https://mooc.chula.ac.th)

Freelance AI Specialist (Part-Time) | GISTDA *Mar 2016 - Dec 2020*

- Conducted cutting-edge AI research under Siam Lawawirojwong's laboratory.

- Led the development of an automated land-use/land-cover (LULC) classification map production system using deep learning.

- Pioneered a multi-class deep learning approach for LULC classification of LANDSAT-8 satellite images.

- Developed a deep learning-based system for forest fire classification in LANDSAT-8 satellite imagery.

Lead Data Science Mentor (Part-Time) | Bangkok Innovation House *Dec 2018 - Jan 2020*

I served as the Head TA for the data science pathway team at Chula MOOC, where I spearheaded Volunteer Teaching in Practical Data Analytics. I utilized RapidMiner and Python to deliver hands-on learning experiences, helping students gain practical skills and knowledge in the field.

AWARDS AND HONORS

- Best Student Paper Award in International Conference on Computing and Information Technology (2017)

- Best Young Researcher Paper Award in 1st International Conference on Smart Technology and Urban Development (2019)

- Global Young Scientists Summit (GYSS) Scholarship from Her Royal Highness Princess Maha Chakri Sirindhorn

- H.M. the King Bhumibhol Adulyadej's 72nd Birthday Anniversary Scholarship (Master)

- The 100th Anniversary Chulalongkorn University Fund for Doctoral Scholarship (Ph.D.)

- The 90th Anniversary of Chulalongkorn University Scholarship (Ph.D.)

- Ratchadapisek Somphot Fund for 2021 Postdoctoral Fellowship, Chulalongkorn University (PostDoc)

- Ratchadapisek Somphot Fund for 2022 Postdoctoral Fellowship, Chulalongkorn University (PostDoc)

- Ratchadapisek Somphot Fund for 2023 Postdoctoral Fellowship, Chulalongkorn University (PostDoc)

- Ratchadapisek Somphot Fund for 2024 Postdoctoral Fellowship, Chulalongkorn University (PostDoc)

- Ratchadapisek Somphot Fund for 2025 Postdoctoral Fellowship, Chulalongkorn University (PostDoc)

- Served as a reviewer for top-tier international journals and conferences—more details at WOS ID: AAO-4985-2020.

REFEREED PUBLICATIONS

1. **Panboonyuen, Teerapong**, et al. MeViT: A Medium-Resolution Vision Transformer for Semantic Segmentation on Landsat Satellite Imagery for Agriculture in Thailand. Remote Sensing 15.21 (2023): 5124.

2. **Panboonyuen, Teerapong**, et al. MARS: Mask Attention Refinement with Sequential Quadtree Nodes for Car Damage Instance Segmentation. International Conference on Image Analysis and Processing. Cham: Springer Nature Switzerland, 2023.

3. **Panboonyuen, Teerapong**, et al. Object Detection of Road Assets Using Transformer-Based YOLOX with Feature Pyramid Decoder on Thai Highway Panorama. Information 13.1 (2022): 5.

4. **Panboonyuen, Teerapong**, et al. Transformer-Based Decoder Designs for Semantic Segmentation on Remotely Sensed Images. Remote Sensing 13.24 (2021): 5100.

5. **Panboonyuen, Teerapong**, et al. Semantic Labeling in Remote Sensing Corpora Using Feature Fusion-Based Enhanced Global Convolutional Network with High-Resolution Representations and Depthwise Atrous Convolution. Remote Sensing 12.8 (2020): 1233.

6. **Panboonyuen, Teerapong**, et al. Semantic Segmentation on Remotely Sensed Images Using an Enhanced Global Convolutional Network with Channel Attention and Domain Specific Transfer Learning. Remote Sensing 11.1 (2019): 83.

7. **Panboonyuen, Teerapong**, et al. Road segmentation of remotely-sensed images using deep convolutional neural networks with landscape metrics and conditional random fields. Remote Sensing 9.7 (2017): 680.

8. **Panboonyuen, Teerapong**, et al. An enhanced deep convolutional encoder-decoder network for road segmentation on aerial imagery. International Conference on Computing and Information Technology. Springer, Cham, 2017.

9. **Panboonyuen, Teerapong**, et al. Image Vectorization of Road Satellite Data Sets, Journal of Remote Sensing and GIS Association of Thailand (2017)

10. Wichakam, I., **Panboonyuen, T.**, Udomcharoenchaikit, C., and Vateekul, P. (2018, February). Real-Time Polyps Segmentation for Colonoscopy Video Frames Using Compressed Fully Convolutional Network. In International Conference on Multimedia Modeling (pp. 393-404). Springer, Cham.

11. Vajeethaveesin, T., **Panboonyuen, T.,** Lawawironjwong, S., Srestasathiern, P., Jaiyen, S. (2022). A Performance Comparison between GIS-based and Neuron Network Methods for Flood Susceptibility Assessment in Ayutthaya Province. Trends in Sciences, 19(2), 2038-2038.

12. Vateekul, P., **Panboonyuen, T.,** Lawawirojwong, S., and Srisonphan, S. (2017, December). Road map extraction from satellite imagery using connected component analysis and landscape metrics. In 2017 IEEE International Conference on Big Data (Big Data) (pp. 3435-3442). IEEE.

13. Chantharaj, S., Pornratthanapong, K., Chitsinpchayakun, P., **Panboonyuen, T.,** Vateekul, P., Lawavirojwong, S. (2018, July). Semantic Segmentation On Medium-Resolution Satellite Images Using Deep Convolutional Networks With Remote Sensing Derived Indices. In 2018, the 15th International Joint Conference on Computer Science and Software Engineering (JCSSE) (pp. 1-6). IEEE.

14. Kantavat, P., Hayashi, Y., City, G. S., Kijsirikul, B., **Panboonyuen, T.,** Achariyaviriya, W., ... & Vateekul, P. Transportation Mobility Factor Extraction Using Image Recognition Techniques, First International Conference on Smart Technology & Urban Development (STUD 2019).

15. Intarat, K.; Rakwatin, P.; **Panboonyuen, T**. Enhanced Feature Pyramid Vision Transformer for Semantic Segmentation on Thailand Landsat-8 Corpus. Information 2022, 13, 259.

16. Thitisiriwech, K., **Panboonyuen, T.,** Kantavat, P., Iwahori, Y. and Kijsirikul, B., 2022. The Bangkok Urbanscapes Dataset for Semantic Urban Scene Understanding Using Enhanced Encoder-Decoder with Atrous Depthwise Separable A1 Convolutional Neural Networks. IEEE Access.

17. Thitisiriwech, K., **Panboonyuen, T.,** Kantavat, P., Kijsirikul, B., Iwahori, Y., Fukui, S., & Hayashi, Y. (2023). Quality of Life Prediction in Driving Scenes on Thailand Roads Using Information Extraction from Deep Convolutional Neural Networks. Sustainability, 15(3), 2847.

PROFESSIONAL SERVICE

- Invited Reviewer of IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)

- Invited Reviewer of IEEE Transactions on Geoscience and Remote Sensing (Publisher: IEEE)

- Invited Reviewer of IEEE Transactions on Industrial Informatics (Publisher: IEEE)

- Invited Reviewer of IEEE Transactions on Artificial Intelligence (Publisher: IEEE)

- Invited Reviewer of IEEE Transactions on Emerging Topics in Computational Intelligence (Publisher: IEEE)

- Invited Reviewer of Pattern Recognition (Publisher: Elsevier)

- Invited Reviewer of Neurocomputing (Publisher: Elsevier)

- Invited Reviewer of Scientific Reports (Publisher: Nature)

- Invited Reviewer of Computer Vision and Image Understanding (Publisher: Elsevier)

- Invited Reviewer of Remote Sensing (Publisher: MDPI)

- Invited Reviewer of PLOS ONE (Publisher: Public Library of Science)

- Invited Reviewer of Computers and Geosciences (Publisher: Elsevier)

- Invited Reviewer of Forests (Publisher: MDPI)

- Invited Reviewer of International Journal of Remote Sensing (Publisher: Taylor and Francis)

- Invited Reviewer of IEEE Access (Publisher: IEEE)

- Invited Reviewer of International Journal of Image and Data Fusion (Publisher: Taylor and Francis)

- Invited Reviewer of International Journal of Distributed Sensor Networks (Publisher: Hindawi)

- Invited Reviewer of International Journal of Imaging Systems and Technology (Publisher: Wiley)

- Invited Reviewer of International Journal of Digital Earth (Publisher: Taylor and Francis)

- Invited Reviewer of International Journal of Pavement Engineering (Publisher: Taylor and Francis)

- Invited Reviewer of International Journal of Food Properties (Publisher: Taylor and Francis)

- Invited Reviewer of IEEE Transactions on Radiation and Plasma Medical Sciences (Publisher: IEEE)

- Invited Reviewer of IEEE Transactions on Vehicular Technology (Publisher: IEEE)

- Invited Reviewer of IEEE Transactions on Human-Machine Systems (Publisher: IEEE)

- Invited Reviewer of IEEE Transactions on Circuits and Systems for Video Technology (Publisher: IEEE)

- Invited Reviewer of IEEE Sensors Journal (Publisher: IEEE)

- Invited Reviewer of IEEE Intelligent Systems (Publisher: IEEE)

- Invited Reviewer of IET Image Processing (Publisher: IET)

- Invited Reviewer of Geo-spatial Information Science (Publisher: Taylor and Francis)

- Invited Reviewer of Sensors (Publisher: MDPI)

- Invited Reviewer of Computer Methods in Biomechanics and Biomedical Engineering

- Invited Reviewer of Mathematical Problems in Engineering (Publisher: Hindawi)

- Invited Reviewer of Journal of Spatial Science (Publisher: Taylor and Francis)

- Invited Reviewer of Journal of Healthcare Engineering (Publisher: Hindawi Limited)

- Invited Reviewer of IETE Journal of Research (Publisher: IETE)

- Invited Reviewer of Transactions in GIS (Publisher: Wiley-Blackwell)

- Invited Reviewer of Transactions on Network Science and Engineering (Publisher: IEEE)

- Invited Reviewer of Connection Science (Publisher: Taylor and Francis)

- Invited Reviewer of Transactions on Consumer Electronics (Publisher: IEEE)

- Invited Reviewer of Imaging Science Journal (Publisher: Maney Publishing)

- Invited Reviewer of Cybernetics and Systems (Publisher: Taylor and Francis)

- Invited Reviewer of Geocarto International (Publisher: Taylor and Francis)

SKILLS

Computer Languages	Python, Java, Processing, C, R, MATLAB, Golang
Tech Stack	GCP, AWS, Docker-Compose, Kubernetes, Streamlit, Swagger UI
Software & Tools	Git, RapidMiner Studio, Looker Studio, Tableau, Power BI
Machine Learning Libraries	PyTorch, TensorFlow, Keras, Theano, Pandas, Scikit-Learn
Other Libraries	Hugging Face, Gradio, GDAL, Beautiful Soup, Selenium, Plotly
Model Evaluation	Weights and Biases (WandB), TensorBoard, Streamlit
Advanced AI Techniques	Retrieval-Augmented Generation (RAG), Large Language Models (LLMs)
My code and see what I'm building	https://github.com/kaopanboonyuen

GET TO KNOW ME BETTER

Alright, let's break the ice! Beyond the research papers and tech jargon, here's the real scoop about me:

I'm a tech enthusiast with a serious passion for using technology to make the world a better place. When I'm not buried in code or geeking out over the latest tech, you might find me lacing up my running shoes or gearing up for a triathlon. Yep, marathons and triathlons are my thing—they keep me fit and remind me that anything's possible with a little grit and a lot of sweat.

I'm a lifelong learner at heart. Whether it's catching the latest tech trends, diving into new research, or just chatting with fellow nerds, I'm always on the lookout for the next big thing in technology.

But it's not all work and no play. I love giving back to the community and am always up for volunteering at events that spark my interest. Connecting with people and making a difference is what keeps me motivated.

So, if you want to swap stories about the newest gadgets, discuss the latest research, or just chat about anything under the sun, hit me up at panboonyuen.kao@gmail.com!

in Thai: ธีรพงศ์ ปานบุญยืน (เก้า)