Pume Tuchinda

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Education

B.S. Computer Engineering, Purdue University, West Lafayette, IN 08/2019 - 12/2022

Focus: Computer Vision and Machine Learning

Professional Experience

Vidyasirimedhi Institute of Science and Technology (vistec)

Research Assistant - Natural Language and Representation Learning Lab 08/2024 - Present

- **Multilingual Reasoning** [1]: Investigating multilingual reasoning in large language models via program-of-thought (PoT) prompting, and preparing an extended analysis on PoT test-time scaling methods for submission to TMLR 2025 under the supervision of Dr. Sarana Nutanong.
- **Datasets**: Developing a Thai cultural benchmark and instruction-tuned dataset to evaluate and improve large language models' understanding of Thai culture; targeting submission to EMNLP 2025.
- **Vision Language Model**:
  - Optimizing vision-language model efficiency using knowledge distillation techniques; targeting submission to WACV 2025 under the supervision of Dr. Peerat Limkonchotiwat.
  - Collaborating with SEACrowd to develop and evaluate multilingual vision language models tailored for Southeast Asian languages and cultural contexts.
- **Open Source Software**: Maintaining the WangchanX Finetune Toolkit and training Thai large language models for public release under the WangchanX project.

AI and Robotics Ventures

Data Scientist 06/2022 - 07/2024

- Fine-tuned YOLOv8 for signboard detection, achieving 85.20% mAP@50 on a diverse dataset of over 50,000 images, and deployed onto AWS Batch and SageMaker for nationwide inference, boosting detection accuracy by 25% over the baseline model across 100+ locations.
- Integrated and deployed Llava for land-use classification and change detection on satellite and drone imagery which significantly increased the efficiency of each municipality.
- Developed an automated image labelling pipeline for object detection and segmentation, increasing the labelling efficiency by 1.5x and accelerating development time for new use-cases by 2x.

Purdue University

Research Assistant - Image Processing and Analysis Lab 08/2021 - 12/2022

- Led a team of 6 students on researching the perception system for self-driving cars to perform traffic object detection, lane intance segmentation, and drivable area segmentation within a unified model, under the supervision of Dr. Edward Delp and Dr. Carla Zoltowski.
- Doubled the frame rate of multi-task networks from 30 to 60 FPS while maintaining state-of-the-art accuracy with 69.8% mIOU for traffic object detection and 84.76% mIOU for lane and drivable area segmentation on the BDD100K Dataset.
- Explored self-supervised monocular depth estimation to extend YOLOv5 to be able to perform depth estimation from a single image and map out the distances of each object in the image.

Research Assistant - cam2 Lab 01/2021 - 07/2021

- Optimized YOLOv5 for ball and person detections using Quantization Aware Training and pruning methods to receive an increase in computation time by 30-40% while sacrificing at most 5% accuracy.

- Developed an image stitching algorithm to stitch a single or dual field of view image taken by a Solar Sail to create a a 360° panoramic image of the sail for generating a 3D model used in image analysis.

Publications

[1] Towards Better Understanding of Program-of-Thought Reasoning in Cross-Lingual and Multilingual Environments
Patomporn Payoungkhamdee, **Pume Tuchinda**, Jinheon Baek, Samuel Cahyawijaya, Can Udomcharoenchaikit, Potsawee Manakul, Peerat Limkonchotiwat, Ekapol Chuangsuwanich, Sarana Nutanong
Findings of the Association for Computational Linguistics (**Findings of ACL**), 2025

Skill

Languages: English (Native), Thai (Native), Japanese (Limited Working Proficiency)
Programming Languages: Python, SQL, C++, C, MATLAB
Frameworks & Libraries: PyTorch, JaX, Transformers, vLLM, Scikit-learn
Tools & Platforms: Docker, AWS (EC2, S3, Batch, Sagemaker)