Trong Tuan Nguyen

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EDUCATION

Hanoi University of Science and Technology — Hanoi, Vietnam
*BASc, Major in Mathematics - Informatics (**Talented Program**)* — *Aug. 2017 – June. 2022*

PROFESSIONAL CERTIFICATES

Microsoft Certified: Azure AI Engineer Associate
Sept. 2023

HONORS AND AWARDS

Zalo AI Challenge 2023: Elementary Math Solving – Zalo Careers — Dec. 2023
TeamLead

- Achieved the Top-5 private leaderboard.
- Hosted by Zalo - one of the biggest tech-company in Viet Nam.
- The challenge focused on developing a language model/system capable of answering elementary-level math questions in alignment with the Vietnamese Education Program.

MLOps Marathon 2023 – vietnamnews — June. 2023 – Sept. 2023
TeamLead

- Achieved the First Prize at the end of the competitions.
- Organized and supported by experts from the University College Cork (Ireland), MLOpsVN, and the Open Factor Foundation, in collaboration with leading technology companies in Viet Nam, including FPT, Techcombank, AWS, CMC, Sotatek, and DopikAI.

HoChiMinh City AI Challenge 2021 – hochiminh.gov.vn — Nov. 2021 – Dec. 2021
Member

- Achieved a Consolation Prize at the end of the challenge.
- An annual challenge hosted by Ho Chi Minh city government to promote AI development and to help building Ho Chi Minh city into a smart city.

PUBLICATIONS

1. **Trong-Tuan Nguyen**, Van-Dat Thang, Van-Thin Nguyen, Phuong T. Nguyen, *SGD method for entropy error function with smoothing l_0 regularization for neural networks*, Applied Intelligence, 2024. [paper, code]
2. Tuan-Linh Nguyen, **Trong-Tuan Nguyen**, Van-Thin Nguyen, *Adaptive Gradient Methods with L_2 and H-Regularization for Non-Convex Optimization*, Under Preparation
3. **Trong-Tuan Nguyen**, Thai T. Vu, John Le, *Refusal-Guided-Attack: Robust and Transferable Jailbreak method Guided by Refusal References*, Under Preparation

INDUSTRY EXPERIENCE

VNPT AI — May. 2023 – Present
NLP Engineer — *Hanoi, Vietnam*

- Implement and optimize the Key Information Extraction (KIE) engine to extract the most important information from the documents, and varied table formats. The developed engine is both fast and accurate. It is designed to have capability to adapt to new show-up documents quickly.
- Responsible for the development of the Large Visual Language Model (LVLM) to bring the best performance in the field of document understanding.
- Be a part of the MLOps team to develop and maintain the life-cycle of the AI models.

Upwork — Nov. 2022 – May. 2023
Top Rated Plus Freelancer in AI & Machine Learning — *Self-Employed*

- Be the Top Rated Plus Freelancer which is the highest prestigious rank in the the Upwork platform.
- 100% of the projects are completed on time and to the client's satisfaction.

- Interest on developing custom CNN models and optimizing the Inference Process.
- Interest on the development of the Large Language Model (LLM) at the time and its related research fields such as the Visual Language Action Model (VLA) topic.

AI VIET NAM July. 2021 – May. 2023

Computer Vision Lecturer, Teacher Assistant *Hanoi, Vietnam*

- Participate in the preparation and teaching of computer vision lectures and projects that included both theoretical and practical knowledge related to both traditional and modern methods.
- Directly guide students in the learning process of the AIO 2021, AIO 2022, and AIO 2023 courses to help them gain a deep knowledge of machine learning and its needed mathematics.
- Participate in research activities by contributing new ideas as well as feedback on proposed ideas.

Techainer, JSC Nov. 2020 – Oct. 2022

Computer Vision Engineer *Hanoi, Vietnam*

- Be in charge to develop the OCR model for document understanding task. Responsible for the whole development process from data processing, training and inference engineering.
- Be a part of the AI camera team which is responsible to develop and build the AI camera system for the company. The system is required to be fast and also robust with small objects.
- Be the host of weekly AI seminars for members to share their knowledge acquired during their daily work at the company. The discussed topics are varied like Data Management, Data Quality Control, Inference Techniques.

WorldQuant, LLC June. 2018 – Sept. 2018

Research Consultant *Hanoi, Vietnam*

- Part-time and work remotely to create and develop high-quality predictive signals (Alphas) through a research platform of the company (BRAIN).

OPEN SOURCE PROJECTS

LLM for Elementary Maths Solving – gitlab

- Design and implement a solution that can solve elementary math problems with high accuracy utilizing both Large Language Model (LLM) and rule-based approach.
- Separate the pipeline into Two stages. Stage 1 is the Reasoning step with Retrieval Augmented Generation (RAG) to provide few-shot examples. Stage 2 is the Final Answer Choice step with three different approaches: Regex Matching, LogProbs Maximization, and Self-Consistency LogProbs.
- Collect Match Problem data from multiple high reliable teaching websites. I generate the Reasoning data by using ChatGPT which is GPT-4 at the time. The data is used to improve the reasoning of the model and to provide few-shot examples for the RAG step.
- Incorprate a regex matching pipeline to extract Math Equations into the model's response and use tool to re-calculate the result to ensure the accuracy.

Gdrive-ops backed YOLO Training Pipeline – github

- Design and implement a training pipeline for YOLO models using Ultralytics and Google Drive Storage.
- The training pipeline can be triggered automatically when new versions of datasets are added to Google Drive. Training results and logs are stored back to Google Drive.
- Support managing available GPUs and running multiple training jobs in parallel.
- Support training monitoring through Weights & Biases or Comet.

COVID-19 Forecasting and Control – github

- Develop a stochastic model based on the SEIR model to predict the outbreak of the coronavirus pandemic.
- The model's parameters are estimated using Metropolis-Hastings algorithm.
- Collect a data about COVID-19 in China from Chinese government.
- The subsequent situation of the epidemic in China also coincided with the model's prediction.

Reproducing ResNet paper – github

- Re-implemented ResNet training pipeline to faithfully reproduce ImageNet-1K results and enable further research.
- Used ClearML for experiment tracking and visualization.

Single Object Tracking with Mean-Shift – github, slide

- Implement Mean-Shift and CAM-Shift from scratch in Python, with enhancements using Hough Transform and SIFT.