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Hieu (Ian) Vu

Hieu M. Vu
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leetcode/lone17

Hieu (Ian) considers himself an individual who is intellectually curious, passion-driven and eager to better himself. He has been working in the industry for over 5 years, his work consists of both conducting research and developing solutions to suit the needs of clients. He's deeply interested in working with AI/ML and is open to any interesting topic/problem. He is looking for opportunities where he could stay current with the literature, develop and implement AI solutions that people enjoy using.

Publications

1 Nguyen, Bao-Sinh, Dung Tien Le, **Hieu M Vu**, Tuan-Anh D Nguyen, Minh-Tien Nguyen, and Hung Le (2022). "Improving Document Image Understanding with Reinforcement Finetuning". In: *International Conference on Neural Information Processing*. **Oral presentation**. Springer, pp. 51–63.

2 Son, Nguyen Hong, **Hieu M Vu**, Tuan-Anh D Nguyen, and Minh-Tien Nguyen (2022). "Jointly Learning Span Extraction and Sequence Labeling for Information Extraction from Business Documents". In: *2022 International Joint Conference on Neural Networks (IJCNN)*. **Oral presentation**. IEEE, pp. 1–8.

3 Nguyen, Tuan-Anh D, **Hieu M Vu**, Nguyen Hong Son, and Minh-Tien Nguyen (2021). "A Span Extraction Approach for Information Extraction on Visually-Rich Documents". In: *Document Analysis and Recognition–ICDAR 2021 Workshops: Lausanne, Switzerland, September 5–10, 2021, Proceedings, Part II 16*. **Best Paper Award, DIL - ICDAR 2021**. Springer, pp. 353–363.

4 **Vu**, **Hieu M** and Diep Thi-Ngoc Nguyen (2020). "Revising FUNSD dataset for key-value detection in document images". In: *arXiv preprint arXiv:2010.05322*.

Education

Bachelor Degree, Computer Science (Honours Programme) **Sep 2016 — Aug 2020**
University of Engineering and Technology - Vietnam National University, Hanoi *GPA: 3.83/4.00*

- **Highest Ranking Graduate.**

Honours and Awards

Best Paper Award **Sep 2021**
ICDAR 2021, Workshop on Document Images and Language
Paper title: A Span Extraction Approach for Information Extraction on Visually-Rich Documents
Accepted for oral presentation and awarded the Best Paper Award at Workshop on Document Images and Language, ICDAR 2021.

Certificate of Highest Ranking Graduate **Aug 2020**
University of Engineering and Technology - Vietnam National University, Hanoi
Awarded to students graduate with the highest GPA amongst the graduating class.

Certificate of Merit for Excellent Graduation **Aug 2020**
Vietnam National University
Awarded by the President of Vietnam National University, Hanoi to students with excellent academic performance and level of conduct during a 4-year undergraduate programme.

Certificate of Excellent Thesis Defence **Aug 2020**
University of Engineering and Technology - Vietnam National University, Hanoi
Awarded to the best thesis of the Undergraduate Thesis Defence Committee.
Thesis title: A Layout-aware key-value relation predicting model for document images.

Certificate of Excellent Student **2016 - 2020**
University of Engineering and Technology - Vietnam National University, Hanoi
Awarded annually to students with excellent academic performance and level of conduct.
3 times awarded.

Academic Encouragement Scholarship **2016 - 2020**
University of Engineering and Technology - Vietnam National University, Hanoi
Awarded to top 8% student every semester on the basis of academic performance and extracurricular activities.
4 times awarded, 6 times nominated.

Top 4 Zalo AI Challenge 2018 - Voice Track **Sep 2018**
Zalo, VNG Corporation (Individual participant)

Finished at 4th place on the Private Leaderboard of the Voice Gender/Accent Classification challenge.

Zalo AI Challenge 2018 is a Kaggle-like competition hosted by Zalo - one of the biggest tech companies in Vietnam. The competition attracted over 700 teams competed in 3 challenges.

Experience

AI Research Engineer **Nov 2018 — Present**
Cinnamon AI *Hanoi, Vietnam*

- **Developing Knowledge-hub technologies for Insurance Domain.**
  - Developing a platform for efficient Large Language Model (LLM) pipeline building: allowing users to build workflows that consists of LLM, Prompts, Vector Stores, Indexers and Retrievers, Agents, Output Parsers, etc.
  - Building demo for LLM workflows targeting the Insurance domain.
  - Building mock UI for pipeline visualization and execution.
  - Working closely with Sale/BizDev teams to shape the product.
  - Related skills: Large Language Models, Prompt Engineering, Information Retrieval, Software Engineering, Business-oriented Development.
  - Technologies used: OpenAI, Cohere, LangChain, LangFlow, Github Actions, HuggingFace, LlamaIndex, Haystack.
- **Researched, developed, and implemented AI solutions for Document Image Understanding.**
  - Co-authored 3 peer-reviewed papers on Key Information Extraction.
  - Key Information Extraction on document images low-resource languages:
    - Implemented MVLM pre-training task for LayoutLM (and variants).
    - Adapted the English pre-trained weights to a low-resource language (Japanese).
    - Pre-trained LayoutLM-based models for the Japanese language and performed fine-tuning on several client data sets, increased the f1-score by 2% - 7%.
  - Document Image Classification, over 85% accuracy achieved on a client data set with 20+ classes.
  - Other: Document Segmentation; Document Object Detection (logos, stamps, check marks, etc.); Data Synthesis/Augmentation (Image Processing based); Text Segmentation; printed/handwriting OCR.
  - Related skills: Research, Training/fine-tuning, Language Model Pre-training, Image Processing, Computer Vision, Natural Language Processing.
  - Technologies used: Python, Pytorch, Tensorflow/Keras, Transformers (Hugging Face), OpenCV, Scikit-learn, LaTeX, DVC, Neptune, CircleCI, Docker.
- **Developed data-driven products and processes.**
  - Worked on Data Management CLI tool: Synchronization and local version control, used by AI Engineers and Researchers to query data from a central database and manage the local copy.
  - Roadmap planning for data-related objectives: lead discussions, identify issues, propose solutions, decide action items for data centralization, data management, data integrity, labeling UI improvement, etc.
  - Initiated data standardization: defined and implemented processes regarding data life cycle and organization, enabling datasets from different client to be re-useable collectively.
  - Related skills: Data Management, Label Schema Design, Data-driven Development, Software Engineering.
- Other tasks: Supporting cross-department alignment; Conducting/Facilitating technical sharing sessions; Training/Mentoring.

Undergraduate Research Assistant **Aug 2017 — Sep 2019**
IOT Lab, University of Engineering and Technology - Vietnam National University, Hanoi *Hanoi, Vietnam*

- **Worked on the Machine Learning Toolkit of the Well Insight platform**
  - Built predictive models for geophysical data using machine learning and statical methods.
  - Worked in conjunction with domain experts and FE/BE engineers to ensure requirements are met.
  - Problem worked on: Facies/rock type classification; Time-series Analysis; Permeability Regression; Integrated Prediction Error Filter Analysis (INPEFA) curve calculation; Cumulative and Federated Learning.
- Related skills: Data Science, Machine Learning, Time-series Analysis.
- Technologies used: Python, Keras/Tensorflow, OpenCV, Scikit-learn, XGBoost, Javascript.

Personal Projects

Data Utility Improvement Experiment for DECAF **Oct 2022 —- Nov 2022**
Personal research

- Studied about Causal Inference, Algorithmic Fairness and specifically the paper DECAF: Generating Fair Synthetic Data Using Causally-Aware Generative networks.
- Conducted experiments on improving data utility of the DECAF method using alternating graph during synthesization while still achieving similar level of fairness.
- Gave discussion and suggestions on the choice of data utility metrics.

Voice Gender/Accent Classification **Aug 2018 — Sep 2018**
Zalo AI Challenge 2018

- **4th place** on the Private Leaderboard, achieved **79.208% accuracy**.
- Individual participant, participated only during the last 10 days/1 month+ of the competition.
- Problem description: Classify the speaker's voice in a recording (typically under 3 seconds) by gender(male/female) and regional accent (northern/central/southern).
- About the competition: Zalo AI Challenge 2018 is a Kaggle-like competition hosted by Zalo - one of the biggest tech companies in Vietnam. The competition attracted over 700 teams competed in 3 challenges.

Electric Meter OCR **Oct 2019 — Nov 2019**
University Coursework Project

- Achieved **0.08 on edit distance** while having the size of just **under 10MB** and processing time of under **0.3 seconds** per image on a normal laptop.
- Problem description: Extract the value on the dial from images of electric meters. The solution is meant to be used in embedded hardwares.

Skills

Programming	**Python**, C/C++, Java, Shell Script.
ML/AI Technologies	**Pytorch, Transformers (Hugging Face), Langchain, Langflow**, Tensorflow/Keras, Scikit-learn, OpenCV.
Tools and Technologies	**Git, Github Action**, CircleCI, DVC, Docker.
AI Domains	**Information Extraction, Large Language Models**, Document Intelligence, Document Understanding, Data Science, Natural Language Processing, Computer Vision.
Environments	GCP, AWS, Linux, Windows.
Languages	Vietnamese (native), English (fluent), Japanese (JLPT N4).
Misc	Problem Solving (hrefhttps://leetcode.com/lone17Leetcode profile), Attentive to detail, Presentation, Communication, Academic Research (Google Scholar profile).

Outreach

Cinnamon AI Bootcamp 2023
Mentoring

- Mentored a group of 4, which won the 3rd prize for their graduation project.
- 2 students received internship offers (out of 5 total offers).
- (These kids gave me serious peer-pressure).
- Design syllabus, prepared entrance tests.

Cinnamon AI Bootcamp 2022
Mentoring

- Mentored a group of 4, which won the 2nd prize for their graduation project.
- (These kids are amazing, far more gifted than I could ever be).
- Design syllabus, prepared entrance tests, interviewed candidates.

Cinnamon AI Bootcamp 2020
Teaching/Mentoring

- Mentored a group of 3.
- Gave lectures on Language Modelling and Transformers to a class of 15 students, most of them hold a Master degree or are Master students.
- Contributed to syllabus design, interviewed candidates.