

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 LLMs-powered applications 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, L<sup>A</sup>T<sub>E</sub>X, 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

- **Developed the Machine Learning Toolkit of an online wellbore data interpretation and management platform.**

- Built predictive models for geophysical data using machine learning and statistical 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 synthesis 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 hardware.

## SKILLS

<b>Programming</b>	Python, C/C++, Java, Shell Script.
<b>ML/AI Technologies</b>	Pytorch, Transformers (Hugging Face), Langchain, Langflow, Tensorflow/Keras, Scikit-learn, OpenCV.
<b>Tools and Technologies</b>	Git, Github Action, CircleCI, DVC, Docker.
<b>AI Domains</b>	Information Extraction, Large Language Models, Document Intelligence, Document Understanding, Data Science, Natural Language Processing, Computer Vision.
<b>Environments</b>	GCP, AWS, Linux, Windows.
<b>Languages</b>	Vietnamese (native), English (fluent), Japanese (JLPT N4).
<b>Misc</b>	Problem Solving ( <a href="https://leetcode.com/lone17">https://leetcode.com/lone17</a> Leetcode profile), Attentive to detail, Presentation, Communication, Academic Research ( <a href="#">Google Scholar profile</a> ).

## 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.