Nguyen Tri Cao

Data Scientist / AI Engineer

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About me

I am an enthusiastic and dedicated student pursuing a degree in Ha Noi University of Science and Technology, eager to apply my academic knowledge and passion for data science, artificial intelligence in a practical setting. I am seeking an internship opportunity as a Data Scientist/AI Engineering to gain hands-on experience, contribute to real-world projects, and learn from industry professionals

Education

- **Hanoi University of Science and Technology** — HaNoi, VietNam
  Bachelor of Computer Science - TROY IT — *2021 – Present*
  GPA: 3.4
- **AI VIETNAM** — 2023 - 2024
  Student

Experiences

- **SotaTek** — HaNoi, VietNam
  AI Engineer Intern — *6/2025 – Present*
  - **Project:** BLOOM AI - Sustainable Agriculture AI Support System
    - **Situation:** Sustainable agriculture faces challenges with chemical fertilizer overuse, leading to environmental pollution and reduced soil health. A client needed an AI system to optimize biofertilizer recommendations.
    - **Task:** Develop a prediction algorithm to recommend optimal biofertilizer amounts based on soil composition (clay, silt, sand), nutrient deficiencies (N, P, K), pH, and organic matter.
    - **Action:**
      - Build a system of workflow agent
      - Collected and cleaned a dataset of 10,000 soil samples from partner farms.
      - Built an automated data processing pipeline to standardize soil metrics.
      - Experimented and compared multiple regression models (Random Forest, XGBoost, Neural Networks).
      - Integrated USDA/FAO standards into the algorithm to ensure scientific validity.
    - **Result:** Achieved 94% accuracy in predicting fertilizer requirements on the validation set. Reduced excess fertilizer usage by 20% in initial field tests.

- **Research in AI VIETNAM**
  Support Teacher Assistant — *10/2024 – Present*

Certificates

- **Coursera**
  - **Link**: IBM AI Engineering
  - **Link**: Data Science with Python
  - **Link**: Data Visualization with Python

- **Link**: Advanced Computer Vision with TensorFlow
- **Link**: Deep Neural Networks with PyTorch
- **Link**: Introduction to MongoDB

Personal Projects

- **VLM Large Vision Language Models**:
  - **Situation:** Existing Vision-Language Models (VLMs) often underperform on Vietnamese datasets due to a lack of high-quality training data. Accuracy on the ViVQA dataset was only around 65
  - **Task:** Fine-tune a VLM (Qwen2VL) on the ViVQA dataset to improve its ability to understand and answer questions about images in Vietnamese.
  - **Action:**
    - Preprocessed the ViVQA dataset: cleaning, normalization, and data augmentation.
    - Selected Qwen2VL as the base model for its multilingual capabilities.
    - Performed Supervised Fine-Tuning with an appropriate learning rate schedule.
    - Evaluated the model using VQA-Accuracy metrics.
  - **Result:** Increased accuracy from 65% to 82% on the ViVQA test set. The model demonstrated a better understanding of Vietnamese cultural context, effectively answering complex questions about local cuisine and landmarks.
  - **GitHub**
- **Multi Agents LLMs**:
  - **Situation:** Traditional single-agent chatbots are limited in handling complex tasks that require different specialized roles.
  - **Task:** Build a multi-agent system with two distinct agents ("Assistant Agent" and "UserProxy Agent") that can communicate and collaborate to solve complex user tasks.
  - **Action:**
    - Configured the Assistant Agent to handle specialized tasks (e.g., coding, data analysis).
    - Configured the UserProxy Agent to manage user interaction and workflow.
    - Designed an efficient handoff and communication protocol between the agents.
  - **Result:** The system successfully handled 95% of tasks (code generation, data analysis).
  - **GitHub**
- **End-to-End Question Answering**:
  - **Situation:** Existing Question Answering systems often struggle to find precise information from large document collections and answer complex questions accurately.
  - **Task:** Build an end-to-end QA system with two core modules: a Retriever (to find relevant text) and a Reader (to extract the answer).
  - **Action:**
    - Used FAISS to build a high-performance vector store for efficient retrieval.
    - Fine-tuned DistilBERT for both dense passage retrieval and reading comprehension.
    - Implemented a re-ranking mechanism to improve retrieval quality.
    - Evaluated the system on the SQuAD 2.0 dataset.
  - **Result:** Achieved an F1-score of 85% and an Exact Match score of 78% on the SQuAD 2.0 dev set. Achieved 92% retrieval accuracy for top-5 passages.
  - **GitHub**
- **Object Tracking**:
  - **Situation:** A traffic monitoring application required accurate, real-time tracking of multiple vehicles under varying lighting conditions and camera angles.

- **Task:** Develop a complete object tracking system to monitor vehicles in video streams for security and traffic monitoring applications.
- **Action:** Python, YOLOV8, DeepSORT
  - Fine-tuned YOLOv8 on the MOT17 dataset to improve detection accuracy.
  - Optimized the video processing pipeline for real-time performance.
  - Implemented DeepSORT for object tracking based on appearance features.
  - Addressed challenging scenarios: occlusions, ID switches, and lighting changes.
  - Evaluated performance using standard metrics: MOTA, MOTP, IDF1.
- **Result:** Achieved a MOTA of 68.5% on the MOT17 test set, outperforming the baseline by 12%. The system maintained stable tracking even in crowded and low-light conditions.
- **GitHub**

- **Visual Question Answering**:
  - **Descriptions:** Visual Question Answering (VQA) is a common problem in Machine Learning, applying related techniques from the fields of Computer Vision and Natural Language Processing.
  - **Data:** VQA - Yes/No Question
  - **Tech stack:** Python, CNN, YOLOV8
  - **GitHub**

- **Train-a-mini-ChatGPT-RLFH**:
  - **Descriptions:** Application of model improvement based on RLHF (Reinforcement Learning From Human Feedback) for summarization text..
  - **Tech stack:** Python, RLHF, ChatGPT
  - **GitHub**

- **Poem Generation**:
  - **Descriptions:** Implement a program that uses the Text Generation model with the topic of Vietnamese poetry generation is based on a Vietnamese word input from the user..
  - **Tech stack:** Python, GPT2
  - **GitHub**

- **Scene Text Recognition**:
  - **Descriptions:** Build a Scene Text Recognition program using YOLOv8 and CRNN
  - **Data:** ICDAR2003
  - **Tech stack:** Python, YOLOV8, Pytorch
  - **GitHub**

- **Predict Diamond Price**:
  - **Descriptions:** With color, carat, cut, clarity, shape can predict diamond price
  - **Tech stack:** Python, Machine Learning
  - **GitHub**

Skills

- **Languages:**Python, SQL
- **Frameworks:** PyTorch, TensorFlow, LangChain, LangGraph, CrewAI
- **Tools:** Docker, Git, MongoDB, PostgreSQL, Microsoft SQL Server, PySpark
- **English:** Fluency