Nguyen Minh Duc

Education

VNUHCM-University of Science — Ho Chi Minh City, VN
Bachelors of Science – Honor Program in Physics — *Sep. 2024 – June 2028*

Experience

Outsource Project Team — May. 2025– Present
Machine Vision AI Developer

- Developed lightweight, few-shot AI models for real-time industrial camera inspection.
- Applied OpenCV extensively for image processing and feature engineering in machine vision.
- Collaborated on AI integration for inspection apps; exposure to ONNX/TensorRT.

Quantum Lab @ VNU-HCM — Dec. 2024– Present
Research Assistant — *Advisor: Prof. Lan Nguyen Tran*

- Benchmarked the capabilities of the GA algorithm combined with Quantum SVM for solving classification problems.

Projects

Vietnamese OCR Project Github — May 2025
Computer Vision

- Achieved up to 25% training speedup using NVIDIA DALI, optimizing data processing and augmentations.
- Developed and released a PyTorch Lightning OCR model (ResNet+BiLSTM+Attention) trained on diverse English/Vietnamese data for robust multilingual recognition.
- Engineered and open-sourced 11M+ OCR images datasets with character normalization for better learning.

Wordle Solver Using Reinforcement Learning Project — Sep 2024
RL

- Using transfer learning from 10 words and progressively expanded to 100 words and the full 2,315 words.
- Faced long training times as the action space increased, achieving 25% accuracy on 100 words (compared to 6% random guessing).

Train GPT-2 with TPU Project — Aug. 2024
Language model

- Reproduced the GPT-2 124M based on GPT-2 and GPT-3 paper on Kaggle.
- Implemented gradient accumulation, distributed data parallel (GPU and TPU), half-precision, and flash attention.
- Sped up training by 33 times compared to GPU T4 x2 using TPU, BF16, and some other TPU optimization.
- Surpassed GPT-2 result with validation loss 3.2754 over 3.2924 and HellaSwag evaluation 0.2962 over 0.294463.

Confined Quantum Random Walk Project, Report — July 2024
MaSSP - Math and Science Summer Program — *Math, Physics, Python*

- Explored quantum random walks (QRWs) using the Creutz ladder model, a quantum lattice structure with localization properties.
- Conducted numerical simulations that confirmed the analytical results, showing zero probability of the particle moving beyond the confined range.

Awards

Top 2% of users on Kattis Problem Archive — Feb. 2024

- Solved numerous advanced algorithmic challenges across domain including data structures, dynamic programming and graph theory.

Skills & Interests

Programming: C, C++, Python

Libraries: Pytorch, Numpy, Pandas, Scikit-learn

Languages: English, Vietnamese

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