Trung Dao

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PUBLICATIONS

(*) denotes equal contribution.

[**P1**] **Trung Dao***, Duc Hong Vu*, Cuong Pham and Anh Tran. "EFHQ: Multi-purpose ExtremePose-Face-HQ dataset." CVPR, 2024.

[**P2**] **Trung Dao**, Thuan Nguyen, Thanh Le, Duc Vu, Khoi Nguyen, Cuong Pham, Anh Tran. "SwiftBrushV2: Make Your One-step Diffusion Model Better Than Its Teacher." ECCV, 2024.

[**P3**] Hao Phung*, Quan Dao*, **Trung Dao**, Hoang Phan, Dimitris N. Metaxas, Anh Tran. "DiMSUM: Diffusion Mamba - A Scalable and Unified Spatial-Frequency Method For Image Generation." Under review, 2024.

[**P4**] Quan Dao*, Hao Phung*, **Trung Dao**, Dimitris N. Metaxas, Anh Tran. "Self-Corrected Flow Distillation for Consistent One-Step and Few-Step Image Generation." Under review, 2024.

EXPERIENCE

- **VinAI Research** — Vietnam
  Research Resident — *March 2023 - Current*
  - **Advisor**: Dr. Anh Tran, Dr. Cuong Pham.
  - **Research Focus**: Generative vision models, with emphasis on GANs and diffusion models.
  - **Past works**:
    - Improved quality of one-step and few-step text-to-image diffusion models [**P2, P4**] .
    - Introduced novel architecture integrating Mamba to diffusion models in order to improve efficiency and performance [**P3**].
    - Developed a large-scale face dataset to enhance face synthesis quality and benchmark face recognition models [**P1**].
  - **Managing HPC cluster**: In charge of managing and optimizing cluster of 48 A100 GPUs. Boosted **x30** real-time GPU utilization by proposing a novel queuing strategy.

- **VinAI Research** — Vietnam
  AI Engineer — *December 2020 - March 2023*
  - **Advisor**: Dr. Dzung Nguyen, Dr. Anh Tran, Prof. Hoai Nguyen.
  - **Face Recognition Module**

    <u>Role</u>: *Module Owner.*
    - Multi-node model training on large-scale datasets (up to 60M images) using HPC systems; optimized training process on SLURM by creating a framework for profiling and parameter tuning.
    - Developed Face Recognition Models in various domains: Masked Face in Access Control, Surveillance CCTV (tested and daily used with the scale of 50K identities).
    - Customized Face Recognition Model is **ranked 8th Overall**: **ranked 2nd on Masked Dataset** and **ranked 10th on Multi Racial Dataset** on *ICCV21-MFR Competition* (July 2022).
    - Built multiple supporting apps for Face Recognition: Model Visualization, Video Inference, Data Labeling Tool (support semi-automated interclass/ intraclass cleaning).
    - Quantized and deployed module of 3 models (up to 30 concurrent streams) using TensorRT for NVIDIA's device, Qualcomm's AIC100, ONNX/MNN/NCNN for Android.
  - **Face Detection Module**

    <u>Role</u>: *Module Co-Owner.*
    - Built multi-task masked-face detector for surveillance cameras, which needs to handle tiny faces and blocking artifacts.
    - Deployed/ Optimized various modules to SDK running on Xilinx devices. Involved in building an asynchronous inference flow for multi-stream (using DeepStream), the final SDK can run up to **60 streams** simultaneously on Xilinx ZCU104.
    - Built an Object Detection visualization tool based on open-source project to analyze data and model output.
    - Built a framework to generate pseudo-mask for existing datasets using both 2D-based and 3D-based methods.
  - **Traffic Sign/Light Recognition Module for Autonomous Driving**

    <u>Role</u>: *Module Co-owner.*
    - Built a novel data pipeline upon CVAT-an open-source data labeling tool to aid the acceleration of video dataset labeling and handling hierarchical multi-label classification data type. The final dataset has *6 superclasses and 317 child classes*.
    - Semi-Managed/Communicated with labeling team to guarantee the data's quality.
    - Built a multi-task model based on the team's previous detector to handle long-tail distribution with a customized loss.
    - Proposed customized hierarchical label loss for traffic sign classification model. The final model has **F1-Score of 98.3** on a private dataset with **171 classes**.

- Attempted to tackle various lightning conditions and track with ReID model for traffic signs.
- Quantized and deployed models using TensorRT for NVIDIA's device.

○ **Noise Cancelling on Smartphone**

Role: Engineer.

In charge of converting models in various frameworks (PyTorch, TensorFlow, ONNX) into TFlite, quantizing and deploying on smartphones. Implemented and optimized process including FFT algorithm, reduced runtime by **40%**.

○ **SmartData**

Role: Engineer.

Refactor existing data labeling pipeline of the current backend system, built in Flask. Added a new feature: An end-to-end multi-step labeling system to improve **30%** labeling time. Built some statistics on the company's data lake.

- **Got It Inc.**   Vietnam
  Software Engineer   _Oct 2019 - January 2020_
  - ○ **GotIt Backend System**
    - Worked on task scheduling for the email system.
    - Techstack: Celery, Flask, ReactJS, PostgresSQL
- **Holomia**   Vietnam
  Game Developer   _Feb 2018 - June 2019_
  - ○ **TopOfVietnam: VR Game**
    - In charge of the backend system: autonomous communication with the Game Booth System and users' database storage. The final product has been deployed at Landmark 81 SkyView and still stable while used by **thousand users**.
    - Techstack: UE4 C++ and Blueprints, Flask, PostgresSQL

Professional Services

Reviewer: ICLR(2025), WACV(2025), NeurIPS(2024), ECCV(2024), CVPR(2023, 2024), ACCV(2022, 2024).

Certificates, Honors and Awards

Top 3 Extraordinary Students
Thang Long University   _2016-2021_
Rank 2nd
VietAI Machine Learning Foundation Hanoi   _2020_
Rank 2nd of Fintech track
Junction X Hanoi   _2018_
Rank 76th
ICPC Asia Hanoi Regional Contest   _2018_

Education

Thang Long University   Vietnam
Bachelor of Computer Science; GPA: 3.79 (9.0/10.0 - Valedictorian)   _Aug 2016 - April 2021_
High School for Gifted Students Nguyen Hue   Vietnam
French Major; GPA: 3.75 (9.0/10.0)   _Aug 2013 - Aug 2016_

Skills Summary

Languages: C++, Python, Unix scripting, SQL
Tools: PyTorch, TensorFlow, TensorRT, ONNX, NCNN, MNN, OpenCV, Docker, Git, Jira

References

Dr. Nguyen Tri Dung: Senior Research Engineer, VinAI Research, Vietnam: v.dungnt244@vinai.io
Dr. Tran Tuan Anh: Senior Research Scientist, VinAI Research, Vietnam: v.anhtt152@vinai.io
Dr. Mai Thuy Nga: Thang Long University, Vietnam: mai_nga@yahoo.com