Bao L. Q. Nguyen

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EDUCATION

Le Hong Phong High School for the Gifted
English-Specialized & Informatics Selected Team Member *2021.09-2024.09*

SKILLS

Engineering

- **Languages** - Python, C/C++/C#, Java (Android), JavaScript
- **Deep Learning** - Python, TensorFlow, Pytorch, Cuda Programming, Huggingface
- **AI Deployment** - Onnx, TensorRT, OpenVino, Cloud AWS, Nvidia Triton, Kaolin
- **Web development** - HTML, CSS, Boostrap, JavaScript, Flask/Django, Nodejs
- **Software System** - CMake, Git/Github, Qt, ImGUI, Docker, Linux/Ubuntu
- **Computer Graphics** - OpenGL, Vulkan, GLSL, Blender, Unity
- **Graphic Design** - Adobe Photoshop, Illustrator, XD, Figma

RESEARCH

- **Current research**
  - **Computer Graphics with Computer Vision**
    - Build my own 3D Graphics Engine - Vortex to simulate advanced physical properties e.g., blood flow, heartbeats, and neuron activation. This can be applied to robotics training simulations & synthetic data generation, aligning with trends like NVIDIA Omniverse.
  - **Other Interest:** Vision Language, 3D Point Clouds, Image Generation, Camouflage, Graph Neural Network, Protein/Molecule structure simulation.
- **Conference papers**
  - RotCAtt-TransUNet++: Novel Deep Neural Network for Sophisticated Cardiac Segmentation.
- **Preprints**
  - Multimodal Contextualized Support for Enhancing Video Retrieval System.
  - Novel 3D Binary Indexed Tree for Volume Computation of 3D Reconstructed Models.

ACHIVEMENTS & HONORS

- 2nd Prize & Special Award (ACM), International Science and Engineering Fair (ISEF), 2024.
- 1st Prize, Vietnam Science & Engineering Fair (VISEF), 2023–2024.
- 3rd Prize, HCM City-level Computer Science, Competitive Programming Competition, 2024.
- 1st Prize "Hacker Award" & 1st Prize "User Experience Award" at a nationwide Hackathon, 2023.
- Top 10 team at final AI Innovation competition (by VinUni x VinAI), 2023.
- 2nd Prize, HCM City-level English Language Specialized Competition, 2021.

PROJECTS

Recent side projects

- **Fast-Vision-CPP**: computer vision in C++ with opencv and accelerated performance backends e.g., onnx, tensorrt, openvino, etc.
- **Custom-Operations**: implementation of both most popular and cutom operations of deep learning in c++ (for cpu) and cuda programming (for gpu).
- **Nvidia-Triton**: triton inference server with different deep learning inference backends for AI product serving and deployment.

- **VasculAR**: Medical-aided software for 3D cardiovascular reconstruction via Deep Learning.
  - ***Time***: Sep.2023–May.2024
  - ***Technologies***: Cython, Python, C, C#, Unity, PyTorch, TensorFlow, Firebase.
  - ***Team lead. Responsibilities***:
    Design, implement, and experiment novel Deep Learning with SOTA methods.
    Implement, optimize and evaluate the 3D reconstruction algorithm.
    Research and implement the algorithm for 3D volume computation(*details*).
    Develop 2 main user interfaces and partly involve in VR development.
    Gather practical feedback from experts in clinical settings.
    Design posters and write/publish research papers.

- **TedUp**: Website equipped with AI-backend for assisting students with ill mental health.
  - ***Time***: Jul.2023–Sep.2023
  - ***Technologies***: Flask/Django, Python, MySQL, Streamlit. Bootstrap.
  - ***Team lead. Responsibilities***:
    Experiment RNN, BiLSTM and BERT for 12 emotional classification.
    Develop hybrid recommender system (neighborhood collaborative & content-based filtering).
    Devise Q-value formula and Q-system for numerically evaluating user's mental quality.
    Design and develop a clean minimal and friendly user interface.

ACTIVITIES

Internship at CoTAI Studio

- **Time**: June to December 2024
- **Role/position**: AI Engineer/Researcher
- **Responsibilities**:
  - Solidify advanced Math foundation and its application in ML, Probabilistic Deep Learning and Generative AI (e.g. diffusion-based models).
  - Research on computer vision, from historical models (e.g., MobileNet, ResNet) to modern advancements like SAM, DINOv2, and GANs.
  - Built/deployed a retrieval system using multimodal models on local servers & AWS.
  - Engineered efficient workflows with Docker, deploying ONNX models on backends like TensorRT and OpenVINO, using Triton Inference Server and FastAPI.

Mentee/Volunteer at PIMA (Project in Mathematic Application)

- Studied Calculus, Linear Algebra, and Linear Programming, etc
- Conducted a project on Graph Combinatorics, focusing on Integer Linear Programming (ILP), the domatic number problem, and properties of the hypercube.
- Volunteer at the puzzle-solving game at Math Open Day.

Captain Basketball Team at LHP High School

- Former captain, now Technical Skills Trainer. MVP in every match, led team to City-Level Quarterfinals (2021-2022).
- Silver Medalist at District-Level (2022-2024); Gold (District) and Silver (City) Medals (2023-2024).
- Organized and played in a charity basketball league.
- Served as an organizer, designer, and referee at the Le Hong Phong Basketball League (LBL) in 2023 and 2024. Earned Gold and Silver Medals at the LBL in 2023.