Huy Gia Tong

Candidate for BSc. in Information Technology @ VNUHCM-US
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TGHuybu Huy Tong

Education

- **Candidate for BSc. in Information Technology** *2021 - 2025*
  VNUHCM - University of Science, Vietnam Current GPA: 3.07/4.00
- **High School Diploma** *2018 - 2021*
  Elite High School of Can Tho University, Vietnam Final Year Average Score: 8.4/10

Skills and Interests

Areas of Interest: Data Science, Scientific Machine Learning, Deep Learning, Numerical Methods, Astronomy, Computational Astrophysics.
Languages: Vietnamese (native), English (proficient).
Programming and Other Languages: Python, C++, HTML, CSS, LaTeX.
Libraries: NumPy, Matplotlib, OpenCV, TensorFlow, PyTorch.
Development Tools: Visual Studio Code, Anaconda, Git, GitHub.
Electronics: Arduino UNO R3, ESP8266 NodeMCU.
Operating Systems: Windows 10, Ubuntu 22.04.
Past Coursework: Data Structures & Algorithms, Discrete Mathematics, Applied Mathematics and Statistics, General Physics 1 (Mechanics - Thermodynamics), Calculus 1 & 2, Linear Algebra, Multivariate Statistical Analysis, Operating System, Object Oriented Programming, Statistical Machine Learning, Applied Digital Image and Video Processing, Computer Vision, Mathematical Methods for Visual Data Analysis, Parallel Programming.

Technical Projects

- **Neural Network in C++ and CUDA**
  A simple neural network implemented in C++ and CUDA
  - Used C++ to implement from scratch some basic neural network operations: forward calculation, backward (gradient calculation), and train. Used CUDA to convert sequential execution on CPU to parallel execution on GPU.
  - Gained experience in parallel programming and optimization.
  - Technology Used: C++, CUDA.
  - GitHub Repository: TGHuybu/CUDA-Neural-Network
- **MNIST Handwritten Digit Classification**
  Softmax regression model to perform digit classification on MNIST dataset
  - Used Python and NumPy to construct and train an image classification model using softmax regression.
  - Gained basic knowledge in fully-connected neural network with softmax activation function, and in gradient descent technique for model optimization.
  - Technology Used: Python, NumPy.
  - GitHub Repository: TGHuybu/MNIST-Digit-Classification
- **C++ Computer Vision Program with OpenCV**
  Program to perform image processing and feature detection
  - Implemented from scratch image processing techniques, edge and corner detection algorithms.
  - Gained experience in managing and working with third-party C++ libraries in Ubuntu environment.
  - Technology Used: C++, OpenCV, Ubuntu 22.04.
  - GitHub Repository: TGHuybu/CPP-OpenCV-Works
- **Image Colour Compression Software**
  Implementation of k-means clustering to reduce the number of colours in an image
  - Used unsupervised k-means clustering to group the RGB vectors and reduce the amount of colour present.
  - Gained understandings of the basic structure of digital RGB images as well as NumPy calculations.
  - Technology Used: Python, NumPy.
  - GitHub Repository: TGHuybu/colour-compression

Research Experience

- **Graduation Thesis on Machine Unlearning** *January 2025 - August 2025 (Expected)*
  VNUHCM - University of Science HCMC, Vietnam (On-site)
  - Work on the novel topic of machine unlearning under supervision of Assoc. Prof. Thai Hoang Le.
  - Research on unlearning method for generative adversarial network (GAN).
  - Collaborate with a fellow student to implement GAN adaptation function using Elastic Weight Consolidation.

- **NCTS-TCA Summer Student (Certificate)** *July 2024 - August 2024*
  Institute of Astronomy and Astrophysics, Academia Sinica Taipei, Taiwan (Remote)
  - Worked on a 2-month summer project under supervision of Dr. Hsien Shang and Dr. Somdeb Bandopadhyay.
  - Studied the basics of physics-informed neural network (PINN) and used PINN to solve nonlinear 1D Burgers' equation.
  - Gained introductory experience in working with the DeepXDE library for implementing PINNs.
  - Presented result orally at the National Tsing Hua University (participated remotely).

- **Research Assistant** *September 2023 - May 2024*
  Project: Probing intermediate-mass black holes in spiral galaxies Remote
  - Supervisor: Dr. Dieu Duc Nguyen.
  - Research computer vision approaches to study the structure and morphology of spiral galaxies.
  - Study the relation of galactic spiral arms' properties and the central black hole.
  - Assist in sample selection.

- **Research Assistant** *August 2022 - Current*
  Project: Hunting intermediate-mass black holes with ELT/HARMONI Remote
  - Supervisor: Dr. Dieu Duc Nguyen.
  - Hands-on experience in reading and referencing academic papers.
  - Assisted in galaxy sample selection and astronomical data acquisition for future observations.
  - Provide occasional computing support for simulation and data analysis procedures.

Conference, Workshop, and School Attendances

- **9th Vietnam School of Astrophysics** *July 2025*
  on galactic physics and research Quy Nhon, Vietnam
- **2024 NCTS-TCA Summer Student Program Mini-workshop** *July 2024*
  on multiple theoretical and computational topics in astronomy Taipei, Taiwan
- **2023 SAGI Astrophysics Workshop** *November 2023*
  on Dust Polarimetry and Applications in Astrophysics Quy Nhon, Vietnam

Publications

Dieu D. Nguyen, Michele Cappellari, Hai N. Ngo, Tinh Q. T. Le, Tuan N. Le, Khue N. H. Ho, An K. Nguyen, Phong T. On, **Huy G. Tong**, Niranjan Thatte, and Miguel Pereira-Santaella (2025). *Simulating intermediate black hole mass measurements for a sample of galaxies with nuclear star clusters using ELT/HARMONI high spatial resolution integral-field stellar kinematics*. Astrophysical Journal, 170, 124. (DOI: 10.3847/1538-3881/ade9ba)

Extracurricular & Competitions

- **SIMIODE Challenge Using Differential Equations Modeling (SCUDEM)** *October 2024 - November 2024*
  Meritorious Award (Certificate) Online
- **University of Science Astronomy Club (USAC)** *November 2021 - Current*
  Media Team Member HCMC, Vietnam
  - USAC is one of the leading astronomy club in Southern Vietnam, aimed to make knowledge about science and space publicly available.
  - Design promotional products (posters, videos) for public outreach events.
  - On-site event photographer.
  - Occasional author of short informational articles about astronomy, published on the club's fanpage.
- **International Astronomy and Astrophysics Competition (IAAC)** *June 2020*
  Pre-finalist (Certificate) Online