Nhan H. T. Luong

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My interest lies in the intersection of computer science and (astro)physics. Within the field of computer science, my primary interests is within **visual computing** (computational imaging, computer graphics, visualization, computer vision) as well as **data-intensive science** (numerical methods, simulation, data processing, machine learning, deep learning).
I am also passionate about teaching and inspiring new generation of scientists and engineers by cultivating their love for science and technology.

Education

Monash University — Melbourne, Australia
BCompSci (Honours) in Computer Science; ***First Class Honours - GPA: 4.00/4.00*** — *Jul 2021 – Jul 2022*

- **Thesis:** An Exploration of Immersive Smoothed-Particle Hydrodynamics Data Visualisation in Astrophysics and Astronomy (PDF version).
  Supervisors: Prof. Daniel Price, Dr. Barrett Ens, Dr. Maxime Cordeil.
- **Coursework:** Statistical modelling; Machine learning; Computer vision; Deep learning; Data visualization.
  Audited courses: Astronomy; Introduction to astrophysics.

Monash University — Melbourne, Australia
BCompSci in Advanced Computer Science; ***High Distinction - GPA: 3.60/4.00*** — *Jul 2018 – Jul 2021*

- **Coursework:** Advanced algorithms & data structures; Computational modelling & simulation; Functional programming; Object-oriented design; Databases; Theoretical computer science; Parallel programming; Operating systems; Mathematics for modelling (linear algebra; multivariable calculus).

Hanoi University of Science - Vietnam National University — Hanoi, Vietnam
BSc (Advanced) in Physics — *Jul 2017 – Dec 2017*

- **Transferred.**
- Top 1 score on entrance exam.

Skills

Languages: Python, Java, C#, JavaScript, MATLAB, R, Swift, Kotlin.

Technologies: PyTorch, TensorFlow, Flask, Node.js, React.js, MongoDB, Git, Docker, Cloud Computing, Unity, Tableau

Work Experience

VinUniversity — Hanoi, Vietnam
Teaching Assistant — *Oct 2022 – Present, Part-time*

- COMP1010 & BANA3020 - Introduction to Programming (Fall 2022, Fall 2023).
- COMP3010 - Algorithm Design (Spring 2023)
- PHYS2030 - Physics III (Spring 2023).

Deloitte Digital — Melbourne, Australia
Software Engineer Consultant — Industry-based Learning — *Jan 2021 – Jun 2021, Full-time*

- Digital consulting and Agile software development experience.
- Experience with Confluence, JIRA, BitBucket/Git, Azure build pipelines and SonarQube.
- Software design, development, testing, pilot readiness and delivery.

Research Experience

VinUniversity — **Security and Artificial Intelligence Lab** Hanoi, Vietnam
Research Assistant *Oct 2023 – Present, Part-time*

- Conducted literature survey and designed taxonomy of contemporary federated learning landscape in communication efficiency perspective under supervision of Assoc. Prof. Kok-Seng Wong.
  (Manuscript in preparation for ACM Computing Survey, December 2023)

VinUniversity — Digital Material Science Lab Hanoi, Vietnam
Research Assistant *Oct 2022 – Present, Full-time*

- **AI for MOF material discovery project (in collaboration with UC Berkeley & Monash University)**
  Developed image recognition system and web application for fast batch crystal detection from automated microscopy images of high-throughput chemistry experiments. Implemented, trained, and conducted performance benchmark of state of the art image classification methods (architectures, augmentations, regularization) on our new dataset of metal-organic framework crystals (MOFs) images.
  Proposed a novel method for dataset-specific augmentation using StyleGAN3 for reliable mixing.
  (Manuscript in preparation for Nature Communications, early 2024)
- **Inverse design for nanophotonics metasurface material topology optimization**
  Conducted literature review to identify current trends in nanophotonics material inverse design using deep neural networks. Led an initiative to investigate practicality of applying published methods for finding materials with desired optical properties via topological optimization.

Monash University — **Immersive Analytics Lab** Melbourne, Australia
Research Scholarship *Nov 2021 – Mar 2022, Full-time*

- **Hand Gesture Capture for Interactive Data Analytics**
  Took over development of an user study web application to record intuitive hand gestures for data exploration and navigation in real-world space akin to augmented reality. Prepare and conduct user study to gather data for analysis under the supervision of Dr. Barrett Ens.

Awards & Achievements

Teaching Excellence Award for Teaching Assistants – Awarded to 2 Teaching Assistant and 8 Faculty members who were nominated by colleagues and students for delivering excellence in teaching and supporting student learning.
(VinUniversity, 2023)

Undergraduate Vacation Research Scholarship – Awarded to undergraduate students who was selected take part in research projects at Monash University over a vacation period.
(Monash University, 2021)

Information Technology IBL Placement Scholarship – Awarded to undergraduate students after a highly selective multi-round interview process to work at a partner organization as a full-time graduate-level employee for one semester.
(Monash University, 2021)

Information Technology International Merit Scholarship (3 years) – Awarded to incoming international students with outstanding academic background and achievements.
(Monash University, 2018)

Public outreach & Other activities

Public lecture/Teaching demo – Computational thinking and algorithm design for high school students.
(VinUniversity, 2023)

Workshop – D3.js for data visualization.
(Monash Association of Coding, 2022)

Hackathon – MACathon 2022: Enable opportunity for university students work together and develop a solution for bettering Australia.
(Monash Association of Coding, 2022)

Peer mentoring – Provided mentoring guidance to 11 student mentees as they started first year at Monash, supporting them through orientation and their transition to university.
(Monash University, 2020)