NGUYEN TRONG DUY

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EDUCATION

Nguyen Tat Thanh Lower and Upper Secondary School **Sep 2023 - Present**

- GPA: **9/10** (Grade 10), **9.4/10** (Grade 11), **9.4/10** (Semester 1, Grade 12)
- SAT: **1540/1600**
- IELTS: **7.5**

HONORS AND AWARDS

Gold Medal – World Invention Creativity Olympics 2025, South Korea **July 2025**

- Competed in an international invention competition encouraging original, self-developed innovations addressing real-world societal and industrial challenges.
- Participated in an open-category evaluation format where projects were assessed on creativity, technical feasibility, practical impact, and clarity of presentation before an international judging panel consisting of university professors and industry leaders.
- Awarded Gold among 313 teams and 1,000+ competitors from 25 countries; showcased a finalised AI-based traffic management system and its potential for real-time deployment.

Silver Award – MSEC Forum (Global High School Forum in HINATA 2025), Japan **July 2025**

- Competed in an open-theme international research forum encouraging independent inquiry aligned with global issues and the UN Sustainable Development Goals (SDGs).
- Awarded Silver among participants from 7 schools across 4 countries (Japan, Taiwan, Vietnam, Thailand); presented an enhanced AI-based traffic management system with expanded training datasets and an improved evaluation process utilising Unity 3D simulations.
- Engaged in cross-disciplinary academic exchange with international peers, fostering global awareness, critical thinking, and socially responsible innovation.

First place - Youth Innovator Competition, Nguyen Tat Thanh L&U Secondary School **May 2025**

- Awarded 1 of 2 First Prizes among 16 recognised teams at the 10th Youth Innovator Competition - a school-based initiative aimed at promoting young leaders in creative thinking, problem-solving, and the ability to come up with effective application of interdisciplinary knowledge to real-world contexts.
- Developed and presented the initial prototype of an adaptive traffic management system, demonstrating both technical feasibility and practical impact.

Silver Award – 26th International Elementz Fair, Singapore **April 2025**

- Awarded Silver among 210 teams from over 80 schools at the International Elementz Fair hosted by Anderson Serangoon Junior College, a regional research and innovation platform where students present primary scientific research and prototypes addressing real-world issues.
- Co-researched the fabrication of Gd-doped Fe_3O_4@SiO_2 nanoparticles, a drug-carrying material aimed at safe and highly targeted delivery; presented results to the scientific community.

RESEARCH

The application of computer vision technology to optimise traffic counters in Vietnam **Mar 2025 - July 2025**

- Developed a cost-efficient and highly optimised AI-based traffic management system, utilising NVIDIA Jetson Nano for real-time edge deployment, YOLOv10 for vehicle detection and driver drowsiness monitoring.
- Designed the F-index, a lightweight temporal aggregation algorithm for fatigue assessment; benchmarked its performance against EAR, CNN, and CNN-LSTM approaches.

- Refined and evaluated models iteratively, achieving 94.4% vehicle recognition accuracy and 91.8% face-based drowsiness detection accuracy.
- Built and validated an end-to-end prototype by developing simulation environments in Unity 3D.

LEADERSHIP

Leader in AI-Based Traffic Management System Research **Mar 2025 - July 2025**

- Led a team of 5 members in system architecture design, model development, and experimental validation. Oversaw integration between traffic simulation and detection modules to ensure cohesive system functionality.
- Defined technical direction and delegated responsibilities across simulation development, model training, and algorithm refinement. Conducted feasibility study for system extension towards supporting multiple concurrent interchange deployments.
- Coordinated iterative testing and performance optimisation to improve system stability and accuracy. Ensured system's ability to process within 15ms per video frame in real-time and with a minimum mAP@0.5 of 94%.

EXTRACURRICULAR ACTIVITIES

Competitor, Robotics Innovation Competition 2025 – HNUE **May 2025**

- Participated in a tournament-based annual Hanoi National University of Education's robotics competition themed "GreenBot Alliance 2025", focusing on collaborative autonomous systems for sustainable solutions.
- Developed a GreenBot capable of operating within a simulated green industrial park. Completed key recycling objectives under time constraints, reached a Quarter-Final finish and demonstrated strong technical competence along with strategic execution.
- Oversaw coordination algorithms, autonomous navigation, and system testing, ensuring reliability and performance under competitive conditions.
- Directed team tactics and coordinated technical preparation, aligning robot design strategies with environmental and real-world challenge themes.

Volunteer - SOS Children's Village Hai Phong **Oct 2024**

- Participated in a school-organised volunteering visit supporting children at SOS Children's Village Hai Phong.
- Engaged in educational and recreational activities with residents, fostering meaningful peer interaction.
- Developed greater awareness of challenges in child welfare and strengthened a sense of social responsibility through direct community engagement.