Do Van Minh

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EDUCATION

Nanyang Technological University (NTU)   Singapore
Master of Engineering in Computer Science   *Jan. 2021 – Aug. 2023*
- **Thesis**: "Multi-Camera Tracking for Smart Urban Mobility".
- **GPA**: 4.5/5.0 (**First-class Honours**).

The University of Da Nang, University of Science and Technology (DUT)   Da Nang City, Viet Nam
Bachelor of Engineering in Electronics and Telecommunications Engineering   *Aug. 2011 – Aug. 2016*
- **Thesis**: " Robotic Arm Design for Armless People Controlled by Head Gestures and Eyebrow".
- **GPA**: 8.14/10 or equivalent to 3.36/4.0 (**Distinction**), **ranked 5/240 in class.**
- **Awards**:

  GE (General Electric) Foundation Scholar-Leader Scholarship (US$3450), **one of ten** undergraduate students in Vietnam   2012 – 2016

  3rd prize at the Science Research Contest of DUT   2016

  1st prize at Vietnam TI MCU Design Contest of Texas Instrument Company   2015

  Exchange program at Utsunomiya University in Japan   2015

  January Star Award from Viet Nam Students Association   2015

WORKING EXPERIENCE

School of Computer Science and Engineering, NTU   Singapore
Master of Engineering in Computer Science | AI, Computer Vision & Embedded System   *Jan. 2021 – Aug. 2023*
- **Multi-Camera Tracking for Smart Urban Mobility.**
  - Devised and implemented an enhanced multi-camera tracking in distributed camera network on an ARM processor, significantly boosting system efficiency and performance on embedded platforms.

School of Computer Science and Engineering, NTU   Singapore
Research Engineer | AI, Computer Vision & Embedded System   *Nov. 2016 – Now*
Key contributor to major projects like TUMCREATE and PUDO, focusing on transport and vehicle interaction in Singapore.
- **Infrastructure to Vehicle (I2V) Communication for Driving Assistance**
- Developed real-time, efficient computer vision algorithms for traffic analysis on embedded systems, reducing cost and power usage.
- Analyzed traffic data from 19 cameras, using object detection and tracking for urban traffic management.
- Implemented and optimized a lightweight AI model for vehicle tracking and crowd counting, enabling 4 edge devices (Odroid N2+) to process live feeds from 9 cameras and communicate with Autonomous Vehicles.
- Supervised and trained 15 student assistants in AI data preparation and annotation.
- **Sensing and Management for Agile Transport**
- Designed and configured multiple cameras (27 cameras) at 8 locations, collecting high-quality videos for accurate traffic demand analytics.
- Developed lightweight computer vision algorithms, trained and optimized AI models on embedded platforms for real-time traffic density estimation, illegal parking detection, illegal entry detection, virtual right of way, crowd counting, and vision-based smart traffic light systems.
- Supervised algorithmic optimization and field testing on various embedded platforms (Odroid XU4, Odroid

N2+), contributing to traffic management innovations at NTU and Singapore-wide.
- **Simultaneous Localization and Mapping (SLAM)**
  - Improved visual SLAM robustness by refining dynamic outlier removal in RGB-D/stereo data, bolstering pose estimation and mapping accuracy.
  - Advanced loop closure detection in long-term SLAM, minimizing false matches with location semantics, and deployed on embedded systems.

Electronics and Telecommunication Department, DUT   Viet Nam

Undergraduate Research Assistant | IoT & Embedded System   Jun. 2014 – May. 2016
- **Team leader, Robotic Arm Design for Armless People project**
  - Designed and programmed a robotic arm with an integrated circuit and microcontroller, enabling user control for item manipulation.
- ***Team leader, Smart Home project***
  - Engineered power sources and electronic circuits using sensors and microcontrollers, and developed algorithms for automated control of electronic devices in various scenarios.

TECHNICAL SKILLS

- **Software and Hardware Experience**
- **Language**: Python, C/C++.
- **Framework**: Pytorch, Tensorflow, NCNN, OpenCV, ROS.
- **Hardware**: sensors (humidity, lighter, infrared, temperature, accelerator, cameras), microcontrollers (8051, MSP430, Arduino), embedded platforms (Odroid N2+, Odroid XU4, Jetson TX1).
- **Software tools:** Git, Visual Studio Code, Docker.
- **Deep learning skills:** Data preparation, learning techniques (transfer learning, distillation learning, supervised, self-supervised learning and unsupervised learning), compression techniques (quantization, pruning), deploying deep learning models on embedded devices.
- **Computer vision skills:** Used to work with change detection, image classification, object detection, image segmentation, crowd counting, single and multi-camera tracking.
- **Language Proficiency**
- Vietnamese: Native language.
- English (IELTS 6.5, tested on Dec 2020).

PUBLICATION

- **Van Minh Do**, Meiqing Wu, Siew-kei Lam, and Thambipillai Srikanthan. "Real-time Deep Visual Tracking on a Tight Budget", 2024 ACM/IEEE International Conference on Cyber-Physical Systems (**submitted**). The work was accepted as the Work-in-Progress (WIP) paper at the 60th Design Automation Conference (DAC).
- **Van Minh Do**, Meiqing Wu, Siew-kei Lam, and Thambipillai Srikanthan. "Real-time Multi-Camera Tracking in Distributed Camera Networks", 2024 30th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) (**submitted**).
- Singh, G., Wu, M., **Van Minh Do**. and Lam, S.K., 2022. Fast Semantic-Aware Motion State Detection for Visual SLAM in Dynamic Environment. IEEE Transactions on Intelligent Transportation Systems, 23(12), pp.23014-23030. (Link).
- Gaurav Singh, Meiqing Wu, Siew-Kei Lam, and **Van Minh Do** "Hierarchical Loop Closure Detection for Long-term Visual SLAM with Semantic-Geometric Descriptors", 24th IEEE International Conference on Intelligent Transportation (ITSC), September 2021. (Link).