CAO LE CONG MINH

Embedded system
Computer vision
Machine learning

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EDUCATION

HCMC University of Technology and Education – Ho Chi Minh, Vietnam.
B.Eng. Mechatronics Engineering. Sep 2019

TECHNICAL SKILLS

*Programming languages***:** C/C++, Python, MATLAB, VBA, C#.
Computer vision libraries: OpenCV-CUDA, Numpy, Matplotlib.
Machine learning libraries: Scikit-learn.
Version control: Git.
Operating Systems: Linux-Ubuntu (Raspberry), Windows.
Embedded system development: Arduino, Arm – Keil, PIC – CCS.
Mechanical software: AutoCAD, Maple.

EMPLOYMENT HISTORY

Embedded Software Intern at **BOSCH -** Ho Chi Minh, Vietnam. Jul 2018 – Mar 2019

I was in a team that was responsible for embedded software development for both Diesel and Gasoline Engine Control System of BMW and Volkswagen customer.

- Found out the root cause of the warnings and error messages of the embedded programming, assessed those was critical or not (not fixed on code).
- Fixed code to obey the MISRA C – 2012 [repo] rules if there were any warning messages about the violation of MISRA standards.
- Coordinated with Packages Responsible (P-Res) to analyzed Function Component's lock conditions to see if it affected to Project Version's functionalities.
- Teck Stack: C/C++, VBA, Python, MS Office.

RESEARCH HISTORY

Fruit quality evaluation [repo] - HCMC University of Technology and Education. 2020
Proposed a method using computer vision to grade the quality of the fruit (mango & apple golden).

- Applied image processing algorithms (Canny edge detection) to separate the background for processing the significant area during the object evaluation - Image segmentation.
- Developed an algorithm to remove the peduncle/pedicle by analyzing the contour of the fruit.
- Extracted morphological features such as size and shape (projected area, length, width, perimeter).
- Built linear regression model to estimate weight of the fruit based on the number of pixels belonging to the area of each fruit excluding the pedicel/peduncle (achieved approximately 95% accuracy).
- Used OpenCV-CUDA both on CPU and GPU to try to accelerate the algorithm.
- Executed the algorithm by using multithreading and multiprocessing in python.

Key skills: C/C++, Python, OpenCV, CUDA, Scikit-learn, Digital Image Processing, Machine Learning.
Advised by M.S. Tran Tien Duc.

ACADEMIC PROJECTS

Driving fatigue detection using deep learning [thesis] – Graduation project. Feb 2019 – Jul 2019
Developed an algorithm using computer vision system to detect driver drowsiness based on behavioral indicators such as head and eyelid movements.

- Applied image processing algorithms (color balancing, histogram equalization and power law transformation) to enhance image qualification.
- Implemented various face detection technique such as Haar Cascades, deep neural network - DNN (Caffe and TensorFlow model).
- Extracted behavioral features such as eye blink duration, frequency, and yawning duration based on facial landmark detection.

Key skills: C/C++, OpenCV - CUDA, Dlib, Digital Image Processing.
Advised by PhD. Bui Ha Duc (NUS).

Digital image processing [repo] **–** Course project. Sep 2018 – Dec 2018
Implemented digital image processing algorithms from scratch.
Key skills: C/C++, Python.
Advised by M.S. Tran Tien Duc.

Dancing robot [repo] **–** Course project. Mar 2018 – May 2018
Built an autonomous robot dancing by beats/rhythms of music.
Key skills: AutoCAD, Arduino, C/C++.

Service robot [repo] **–** Course project. Mar 2018 – May 2018
Designed UI (user interface) by using WPF.
Key skills: C#, WPF.

AWARDS

Consolation award, 30th National Mechanics Olympic, Vietnam. May 2018
Tutored by Ph.D. Truong Quang Tri.