SIRAWIT PUTPAT

Email	ppsirawitgm@gmail.com	LinkedIn	linkedin.com/in/sirawit-p-7ab084143
Phone	Thai (+66) 84 760 7924	GitHub	github.com/witignite
Website	sirawit-github.github.io	GitLab	gitlab.com/SirawitP

About

A robotics software engineer with ~1 year of experience who is passionate about the digital transformation and about building software infrastructure that will help create the autonomous world.

My work at AI & Robotics Ventures (a start-up of a petroleum company PTTEP) revolves around improving the autonomous level of the subsea pipeline inspection robot by solving challenging problems in computer vision, robotics, machine learning and deep learning domain. We design and develop the code from scratch and it's a very fun experience.

Education

Korea Advanced Institute of Science and Technology
(Discontinued) MSc Electrical Engineering
Urban Robotics Lab
Aug 2020 – Oct 2020

Korea Advanced Institute of Science and Technology
BSc Electrical Engineering (Computer Science minor)
Aug 2015 – Mar 2020

Mahidol Wittayanusorn School
2013 – 2015

Experience

Robotics Software Engineer
AI & Robotics Ventures *(Oct 2020 – Present · 11 mos)* [Video]
Autonomous Underwater Vehicle for Subsea Pipeline Inspection

- Lead 1 AI project. Implement object detection and tracking, and geometrical path planning algorithm, which improves the auto docking process by reducing the operation time from an hour to less than 10 minutes.
- Optimize all deep learning models currently used in the robot for real-time inference.
  Keywords: model quantization, Intel OpenVINO, Nvidia TensorRT
- Work on anomaly detection using synthetic data. Currently working on dataset generation in Unity.
- Develop machine learning models for pipeline inspection. Write a custom 3D point cloud segmentation/clustering algorithm which improves the robot navigation.
- Implement a custom sonar simulation as a Gazebo plugin using computer vision techniques, allowing us to verify the whole algorithm in simulation without having to go offshore. The algorithm is written in CUDA, ~2-3x faster than OpenCV.
- Implement sensor fusion based on EKF.
- Write and maintain hardware drivers interfacing with the AUV, including INS and USBL communication system.
- Develop and currently migrate software stack from ROS1 to ROS2.

Graduate Research Student
The University of Tokyo *(Apr 2020 - Aug 2020 · 5 mos)* [Link]

- Participated in the research discussion at Kamijo Lab.

Undergraduate Research Intern
Urban Robotics Lab *(Aug 2019 – Mar 2020 · 8 mos)* [Link]

- Worked with a team to develop a perception software for a real car, as part of a Self-Driving Competition in South Korea.
- Trained a deep learning model for LiDAR-based 3D object detection. Optimized for the inference by using ONNX and Nvidia TensorRT, running ~18 FPS on a laptop-grade GPU.
- Proposed a data augmentation technique to mitigate the sensor difference, increasing accuracy by ~10%.
- Implemented 3D tracking using Kalman filter (tracking by detection).

Undergraduate Research Intern
Vertically Integrated Architecture Research Group *(Sep 2018 – Jul 2019 · 11 mos)* [Link]

- Implemented a custom-designed accelerator for a sparse CNN model using Vivado High-Level Synthesis Language (HLS).
- Tried to hack into TVM (Open Deep Learning Compiler) and use it to compile a deep learning model into a hardware code that runs on a custom-designed FPGA-based accelerator.

Embedded Software Engineer Intern
Toyota Tsusho Nexty Electronics CO., LTD *(Jul 2018 – Aug 2018 · 2 mos)* [Link]

- Implemented PID control software on Renesas RX62T controller board.
- Worked on path following simulation in MATLAB.

Undergraduate Research Intern
National Electronics and Computer Technology Center (NECTEC) [Link] *(Jan 2018 – Feb 2018 · 2 mos)*

- Studied analog circuits for energy harvesting devices

Projects

3D Object Detection using Bird's Eye View LIDAR Data *(Fall 2019)* [Link]

- A reimplementation of PIXOR 3D object detection from CVPR paper

Monocular Visual Odometry *(Fall 2019)* [Link]

- Implemented a simple monocular visual odometry from scratch, including feature extractions, RANSAC, fundamental matrix estimation, pose estimation, and motion-only bundle adjustment in MATLAB

Autonomous Ball-Collecting Robot using Reinforcement Learning *(Capstone Design class, 2018)* [Link]

- Implemented a reinforcement learning-based approach (Deep Q-Learning) for the planning of the robot in Python
- Implemented on NVIDIA Jetson TX2 board, using 2D LiDAR data at running time

Movies Recommendation System *(Big Data Analytics class, 2017)*

- Implemented a recommendation system using collaborative filtering approach with latent factors

Awards

- Silver Medal, 12th National Thailand Physics Olympiad

Selected Online Course Certificates

- Production Machine Learning Systems [Credential]
- Machine Learning with PySpark [Credential]
- Deep Learning Specialization [Credential]
- Advanced Deployment Scenarios with TensorFlow [Credential]
- TensorFlow Developer Specialization [Credential]
- Motion Planning for Self-Driving Cars [Credential]
- State Estimation and Localization for Self-Driving Cars [Credential]
- Visual Perception for Self-Driving Cars [Credential]

Skills

Language	C/C++ • Python • MATLAB • Scala (Novice)
Python	Numpy • Scipy • Scikit-learn • Pandas • OpenCV • pybind11 • PySpark (Basic)
C++	CMake • STL • Eigen • Boost • Point Cloud Library
ML	TensorFlow • PyTorch • TensorRT • OpenVINO • ONNX
GPU	CUDA
Robotics	ROS1 • ROS2 • Gazebo
Productivity	Git • Jira
IDEs	VS Code • PyCharm • CLion • Nvidia Nsight Eclipse
Others	Linux • Shell Scripting • Unity (Basic) • Qt5 (Basic)