Adam Purnomo

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Education

Tohoku University — Sendai, Japan
M. Eng in Robotics — *Oct. 2020 – Sep. 2022*

Tohoku University — Sendai, Japan
B. Eng in Mechanical and Aerospace Engineering — *Oct. 2016 – Sep. 2020*

Research Projects

Sparse Identification of Lagrangian for Dynamical Systems | *Python, PyTorch, Sympy*
- Formulated the problem of Lagrangian identification into a learning-based framework
- Investigated and implemented robust optimization methods for sparse solutions
- Implemented simulations of four ideal nonlinear dynamical systems to validate the proposed method
- Improved noise robustness from previous Lagrangian identification algorithm up to 6 order of magnitude

Deep Learning-based 6-DOF Grasp Estimation | *Python, C++, TensorFlow, OpenCV, NxLib, INtime*
- Investigated implicit 3D rotation representations of the end-effector for 6-DOF grasp estimation from depth images
- Developed a CNN-model for 6-DOF grasp estimation for bin-picking
- Built NxLib camera API for python interface
- Integrated the inference library with INtime RTOS API using python socket programming
- Improved grasp success rate up to 66% from 4-DOF grasp estimation.

Personal Projects

Good Apps, App Reviews Website | *Python, Django, PostgreSQL, Bootstrap, jQuery*
- Built a dummy website app that manages CRUD operation from user input, and handles AJAX request
- Implemented features such as user authentication, create/edit posts, upvote/deupvote posts, add/delete reviews, and like/dislike reviews

Mathematical Modelling for Cancer Growth | *Python, Numpy*
- Built a visualization of cancer growth and propagation based on reaction-diffusion equation
- Implemented explicit finite difference method to perform cancer simulation

C3 Robot Arm Control | *C, Linux, QNX*
- Solved forward and inverse kinematics, and implemented simple path planning for a 6-DOF C3 robot arm
- Implemented Resolved Motion Rate Control for a redundant manipulator (7-DOF robot arm)

Pen π | *Raspberry* π*, Python*
- Contributed to the development of a prototype pen which converts handwriting to latex code with MEMS sensors
- Implemented Kalman Filter and quaternion transformation for raw data processing

Simple Car Navigation System | *C, OpenGL*
- Implemented Djikstra's Algorithm for shortest path search from dummy map data
- Built an interactive GUI car navigation system built using OpenGL packages

Skills

Programming Languages: Proficient (Python; C) , Knowledgeable (C++; Java; HTML; CSS; JavaScript)

Frameworks and Tools: Django, Bootstrap, jQuery, PostgreSQL, Pytorch, TensorFLow, OpenCV, NxLib, Git

Languages Proficiency: English (full professional working proficiency), Japanese (limited working proficiency; JLPT N2), Indonesian (Native)

Honors and Awards

Tohoku University President's Award (2021), **Sato-Yo International Scholarship** (2020-2022), **Monbukagakusho Scholarship** (2016-2020)