Suparach Intarasopa

B.E. Robotics and Automation Engineer
Institute of Field Robotics, KMUTT, Thailand

My Profile: Suparach Intrarasopa
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I'm graduated with a bachelor's degree in Robotics and Automation Engineering at King Mongkut University of Technology Thonburi. I have a strong interest in Brain Computer Interface (BCI) and Human Robot Interaction. I possess experience in implementing human-robot interaction systems and creating BCI systems to analyze control commands from brain signals.

Education

Bachelor of Engineering 2024
Robotics and Automation Engineering Bangkok, Thailand
Institute of Field Robotics
King Mongkut's University of Technology Thonburi (KMUTT)
GPAX: 3.69

High School Graduate 2020
Rayongwittayakom School Rayong, Thailand

Research interests

Brain Computer Interface (BCI), Human Robot Interaction, Robotics Software Development

Skills

- Programming: Python, MATLAB, Unity (C#), JavaScript
- Neuroimaging Tools & Analyses: EEG, MNE, EEGLAB
- Robotics Tools & Framework: ROS2

Project &Work Experience

Undergraduate Thesis: Jun 2023 – May 2024
Evaluating the Potential of Low-Cost BCI Devices for Online Classification of Four-Class Motor Imagery States
Institute of field robotics (FIBO), KMUTT

- Conducted experiments using low-cost, consumer-grade EEG equipment (8-channel dry electrodes) with a limited electrode count.
- Utilized Python-MNE for the real-time classification of four motor imagery classes, employing a deep learning model (CNN-LSTM).
- Thesis paper accepted at the International Conference on Brain Informatics (BI 2024).

Research Assistance, Neuroscience Center for Research and Innovation Jun 2023 – Now
Learning Exchange (LX), KMUTT

- Experience on recruiting volunteer subjects for experiments, set up EEG BIOSEMI, and Real-time data monitoring.

- Preprocess collected EEG data (e.g. Epoch segmentation, data labeling, ICA) using MATLAB and Python.

Research Assistant, Human Computer Interface Lab Jun 2022 – Now
META MOBOT Team (Teleoperation of mobile robot control via virtual world)
Institute of field robotics (FIBO), KMUTT
- Implement software on Jetson Nano to control Dynamixel motors connected to omnidirectional wheels and control 6 DOF robotic arm (Openmanipulator-P) for move to desired position in either joint space or task space.
- Implement MQTT broker for receiving user's movement commands and sending feedback between mobile robot and the user in the virtual control room.
- FIBO Tour staff: Exhibited META MOBOT for real users test on 18-19 September 2022 & 12-15 January 2023 at Central RAMA 9, Bangkok.

Internship, Mitsubishi Motor Thailand Jul 2023 – Aug 2023
Manufacturing-Body
Laemchabang, Chonburi, Thailand
- Study the manufacturing process for producing body parts and explore the routine responsibilities of a manufacturing engineer.
- Have experience teaching industrial welding robots' arm (Fanuc) and providing instruction in basic Fanuc operation programming.
- Internship Project: Investigated methods to reduce the energy consumption of a robot arm without increasing the cycle time of line operations.

Teleoperation of Portrait Drawing with Robot Arm Sep 2023 – Nov 2023
Institute of field robotics (FIBO), KMUTT
- Utilize cycleGAN to generated portrait drawing image from input image then use the OpenCV library to extract lines for drawing with robot arm (UR3e).
- Implement WebRTC using PeerJS library for steam real-time video to the user while the robot is drawing.

BCI-SSVEP for Gripper Control Feb 2023 – Apr 2023
Institute of field robotics (FIBO), KMUTT
- Design a system to control gripper closing and opening using the SSVEP paradigm with different frequencies, specifically 6 Hz and 12 Hz.
- Utilize OpenBCI as EEG signal acquisition around visual cortex and set up experiment to pay attention to different frequencies, then implementing real-time classification commands to control the gripper.

Voice Controlled Robot Arm Feb 2023 – Apr 2023
Institute of field robotics (FIBO), KMUTT
- Design a system to select objects and colors for grabbing through voice commands using the UR3e robot arm.
- Utilize a depth camera to detect the position of the desired object with YOLO and transmit the position to the robot arm for grabbing.

3-DOF Robotic Arm Trajectory Tracking System Aug 2022 - Dec 2022
Institute of field robotics (FIBO), KMUTT
- Design 3DOF robotics arm to draw a sequence of letters by moving end-effector and simulation robotics arm tracking system in RVIZ with ROS2.

- Implement trajectory generator to create path for movement to target via points and trajectory tracker to control robotic arm move follow trajectory utilizing PI control.
- Create kinematics solver for calculating forward position kinematics, inverse position kinematics, and inverse velocity kinematics of 3-DOF robotic arm.

High Precision 1-DOF Robot Jan 2022 - Jul 2022
Institute of field robotics (FIBO), KMUTT
- Lead a software team to implement angular trajectory path and utilize cascade PID control with C language on STM32 Nucleo-F411R for control a DC motor to rotate 50 cm robot arm with less than 5 mm error.
- Implement close loop control system by modelling motor and create trajectory with MATLAB to identify PID value for used in real world system.

Teaching Experience

- "Brain Code 101-Brain Code Camp 2024, Thailand"
    - Duration: Aug-Oct 2024
    - Role: Teacher assistance
    - Highlights: Give advice and follow the progress of projects about EEG preprocessing and AI of students in camp.
- "Neuromedia: Exploring BCI Technology in Bio-Digital Age"
    - Semesters: Aug-Dec 2024
    - Role: Teacher assistance
    - Department: Media Technology (MDT), KMUTT
    - Highlights: Lecture on Brain Computer Interface experimental design with Unity.
- "Neuro Innovation for Real World Oscillation"
    - Semesters: Jul-Sep 2024
    - Role: Teacher assistance
    - Department: Darunsikkhalai School
    - Highlights: Facilitator on Basis Machine Learning and Signal Preprocessing.