Suparach Intarasopa

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

Portfolio: Suparach Intrarasopa
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Contact Information

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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

Research interests

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

Skills

- **Programming:** Python (Proficient), C/C++ (Intermediate), MATLAB (Intermediate), Javascript (Beginner)
- **Machine Learning Frameworks:** PyTorch, TensorFlow, Scikit-learn
- **Robotics Tools & Framework:** ROS2, Dynamixel SDK, Close Loop Control

Publication

Intarasopa, S., Sakulkueakulsuk, B., Chaisilprungraung, T. (2025). Evaluating the Potential of Low-Cost BCI Devices for Online Classification of Four-Class Motor Imagery States. *Brain Informatics. BI 2024.*

Work Experience

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, Tobii pro eye tracker, and Real-time data monitoring.
- Preprocess collected EEG data using MATLAB and Python.
- Implement Real-time EEG monitoring GUI program for real-time graph plotting and BCI-SSVEP based application.

Research Assistant, Human Computer Interface Lab Jun 2022 – Apr 2025
Institute of field robotics (FIBO), KMUTT

META MOBOT – Software Developer

- 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 robot-user telecommunication system, utilize MQTT for data transfer and Peerjs for webRTC video streaming.

AI Photobooth – Project Leader

- Lead the development of an AI-powered photobooth system utilizing Stable Diffusion for clothing and background style transfer, showcasing Thai traditional fashion.
- Designed and integrated image processing pipelines, web-based user interface and QR-code scanning system.

Internship, Mitsubishi Motor Thailand Jul 2023 – Aug 2023
Manufacturing-Body
Laemchabang, Chonburi, Thailand
- Studied industrial welding robots' arm (Fanuc) and providing instruction in basic Fanuc operation programming.
- Proposed methods to reduce the energy consumption of a robot arm without increasing the cycle time of line operations.

Projects

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).

Virtual art BCI with emotions May 2025
g.tec- BR41N.IO DESIGNERS' HACKATHON 2025
- Utilized machine learning to classify users' emotions (valence and arousal) from EEG signals in real time, generating dynamic virtual art that reflects changes in emotional states.

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.
- “ : Exploring BCI Technology in Bio-Digital Age”
    - Semesters: Aug-Dec 2024, Feb-May 2025
    - Role: Teacher assistance
    - Department: Media Technology (MDT), KMUTT
    - Highlights: Lecture on Brain Computer Interface experimental design with Unity. Provide example code of brain signal preprocessing and machine learning classification.
- “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.

Exhibition and Staff

META MOBOT Exhibition: Provide participants can control mobile robot via virtual reality (VR).

- FIBO Tour: META MOBOT on 18-19 September 2022 at Central RAMA 9, Bangkok
- FIBO x Kid Day Future Land: 12-15 January 2023 at Central RAMA 9, Bangkok

AI Photobooth Exhibition: Using AI to generate participant clothes and background in Thai traditional theme on 2 June 2025 at SCBX Next Tech, Siam Paragon, Bangkok.