Norawit Nangsue

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EDUCATION

Master of Engineering, Robotics and Automation Engineering 2018-2022
King Mongkut's University of Technology Thonburi, Bangkok, TH

Bachelor of Engineering, Electrical Engineering 2014-2018
Chulalongkorn University, Bangkok, TH

Certificate in Technical Education, Electrics and Electronics 2011-2013
King Mongkut's University of Technology North Bangkok, Bangkok, TH

WORK EXPERIENCES

Software Engineering Supervisor 2022-Present
Industrial Service, Institute of Field Robotics, KMUTT, Bangkok, TH
Lead and oversee engineering projects in software aspects, design system architecture, guide fellow programmers and initiate several core technologies such as

- Behavior tree, media controller, and robot status manager.
- Navigation stack aka. amcl, gmapping, robot_localization and move_base
- 8+ hardware interfaces including drives, a linear actuator, Modbus, and UWB.
- Robot-elevator integration including localization and regulating a mobile robot towards small elevator gap.
- In-house AI framework that integrates speech-to-text (STT), small language model (SLM), and text-to-speech (TTS), bringing service robots to life.

Electrical Engineering Trainee 2017
Silicon Craft Technology PLC, Bangkok, TH
Designed and implemented a two-stage operational amplifier, and developed an AES-256 encryption and decryption module for FPGA using VHDL.

PROJECTS

Remote Container Inspection Robot 2023-Present
Project Delivering to PTTGC by FIBO Industrial Service
Lead Programmer - A mission-specific robot designed to measure container thickness using advanced localization techniques for precise 3D constrained positioning.

Golf Cart Modification for Autonomous Capability 2023-Present
Project Delivering to YAMAHA by FIBO Industrial Service
Lead Programmer - An Ackermann steering golf cart implemented with ros2_control that features dual Raspberry Pi redundancy, to enable reliable autonomous navigation.

Shopping Center Surveillance Robot 2022-2024
Project Delivered to Siam Paragon by FIBO Industrial Service
Lead Programmer - A specialized robot that autonomously patrols multiple floors, monitors security, and provides real-time alerts for fire, puddles, or suspicious individuals to enhance safety throughout the mall.

Autonomous Mobile Robot with Workpiece Gripping Arm 2022
Project Delivered to NECTEC by FIBO Industrial Service
Lead Programmer - The first robot developed in Thailand to utilize the concept of behavior trees and drag-and-drop programming in a mobile manipulator.

Autonomous Robot for Land Surface Preparation in Salt Farming 2018-2022
Master's Thesis
The first fully automated clay roller, inspired by a family salt harvesting business, integrates robotics into traditional practices by replacing all fuel-powered components with modern electric systems.

MINERVA: A 6U Nanosatellite with an Autonomous Intelligent Biological Operating System (AIBO) for Deep-Space Experiment 2021
2nd place - 7th Mission Idea contest for Deep Space Science and Exploration
Orbit Design & Simulation - A 6U nanosatellite to culture genetically modified C. elegans in cis-lunar orbit, testing their radiation tolerance in deep space, serving as a foundation for future space biology research and advancements in space exploration.

SOFA: An Autonomous Telemedicine Mobile Robot 2020-2021
FIBO Against COVID-19 (FACO), FIBO Industrial Services
ROS Programmer - A mobile robot designed to assist medical personnel by providing remote patient monitoring and diagnostics, equipped with PTZ and thermal cameras to reduce the need for physical presence during COVID-19.

Student Small Satellite Project (SSS) Summer Program 2017-2019
Asia-Pacific Space Cooperation Organization (APSCO)
Delegate of Thailand - Participated in satellite systems seminars at Beihang University, Middle East Technical University, and Shanghai Jiao Tong University, as well as the Microsatellite Contest.

Analysis and Design of 5 GHz Planar Phased Array Antenna 2018
Outscored - Bachelor's Senior Project
A 2x2 microstrip phased array antenna for 5.8 GHz, analyzed, designed, developed, and tested on FR4 substrate using the feed-translation technique.

SkinDoc: AI-Powered Skin Detection and Diagnosis 2018
The Best Team Winner - Azure Inspire 2018 : Geek-a-Thon
Business Lead - A startup application mock-up leveraging Azure's Custom Vision image classifier for preliminary skin disease diagnostics.

Chulalongkorn University Mini Design Challenge 2017
Solo Champion
Implementing a UART transmitter and Receiver, a sine wave generator, and an 8-bit PCM audio player on an FPGA using VHDL.

PROFICIENCIES

Programming Expertise
C++, CMake, Python, ROS1/2, MATLAB, JavaScript, VHDL.
Technical Expertise
Robotics Architectural Design, Hardware Interfaces, Robotics Navigation, SLAM, Control Systems, Point Cloud/Image Processing, Computer Vision, Sensor Fusion, Behavior Trees, Path Planning, Hierarchical Finite State Machines, Scheduling Systems, Vehicle Routing Problem, Convex Optimization, Neural Networks.

FIELD OF INTEREST

Artificial Intelligence, Optimization, Legged Robot, Robotic Manipulation

PUBLISHED PAPERS

High-altitude balloon platform for studying the biological response of living organisms exposed to near-space environments
Heliyon, 2024 *10.1016/j.heliyon.2024.e27406*
Supporting Contributor - High-altitude balloon experiments observing microbial survival under UV irradiation compared to other extreme conditions.

MINERVA: A CubeSat for demonstrating DNA damage mitigation against space radiation in C. elegans by using genetic modification
Heliyon, 2022 *10.1016/j.heliyon.2022.e10267*
Supporting Contributor - A CubeSat with a biology payload utilizing genetic modification to enhance radiation tolerance in C. elegans, testing DNA damage protection for future space exploration.

Complete Coverage Navigation for Autonomous Clay Roller in Salt Farming Application
ACIRS, 2021 *10.1109/acirs52449.2021.9519339*
Lead Author - A complete coverage navigation framework for an autonomous clay roller in salt farming applications, incorporating both a path planner and a path tracker.