SUMMER RESEARCH 2024/25
PROJECT ABSTRACT

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

PROJECT # 29

SUPERVISOR/S: Dr. Anany Dwivedi & Dr. Mahonri Owen

PROJECT TITLE: GestureQuest: Crafting the Future of Gesture Recognition with Muscle-Machine Interface

FIELD: Mechatronics Engineering, Robotics

DIVISION/SCHOOL: HECS - Au Reikura School of Computing and Mathematical Sciences

PROJECT LOCATION: Hamilton

PROJECT ABSTRACT:
This project focuses on the design and development of a portable, low cost data recording interface using microphones, inertial measurement units (IMUs), and Arduino to capture mechanomyography (MMG) data. The primary goal is to create a system for recording, preprocessing, and classifying gestures based on MMG signals. Undergraduate students will engage in the hands-on assembly of the data recording interface, ensuring its functionality and reliability. They will develop software tools for data acquisition and preprocessing, facilitating a deep understanding of the MMG data characteristics. The project will also involve collecting MMG data corresponding to various gestures, forming a valuable dataset for assessing system performance. This project aims to equip students with practical skills in interfacing hardware and software and also introduces them to the exciting field of gesture recognition through MMG, paving the way for future innovations in human-computer interaction.

STUDENT SKILLS:

- Experience with circuit design
- Experience with Python

PROJECT TASKS:

1. Design and assemble an interface using microphones, IMUs, and Arduino to record mechanomyography (MMG) data.
2. Use the developed interface to make recordings of MMG data and analyse data
3. Document the entire project process and prepare a poster.

EXPECTED OUTCOMES:

- Student's Research Poster (as per clause 6 of the Scholarship regulations)
- Design and assemble a functional data recording interface using microphones and/or IMUs, and Arduino.
- Develop software for data acquisition and analysis of MMG data.