DEPARTMENT OF BIOMEDICAL ENGINEERING
COLLEGE OF ENGINEERING AND APPLIED SCIENCES

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

APPLICATION DEADLINE: 03/01/2024

PROJECT TITLE: <u>Graphical User Interface (GUI) for KickStat</u>

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Project Description

A wide variety of medical applications utilize electrochemical biosensors, notably glucose monitors for patients with diabetes. As wearable electronic devices for health monitoring applications have become increasingly popular, there is a push for these biosensor devices to measure analytes in the user's sweat, becoming smaller, faster, and easier to interface with. These biosensors depend on potentiostats, instruments capable of measuring electrochemical cells necessary for amperometric sensing. We have previously developed KickStat , a miniature potentiostat that can measure cocaine in simulated sweat using cyclic voltammetry and square wave voltammetry. KickStat can also perform general electrochemical measurements of potassium ferricyanide using chronoamperometry and normal pulse voltammetry. We are improving our hardware to include Bluetooth Low Energy (BLE) capabilities, allowing KickStat to wirelessly interface with a smartphone to send data and configure system settings. KickStat will also include software adjustable gain and multiple channels for simultaneously measuring multiple analytes while maintaining the continuous demand for smaller hardware.

To make it easier interfacing with KickStat easier, we are developing a

graphical user interface (GUI), allowing researchers and students to easily
to interface with KickStat. The GUI will allow users to send necessary
commands to send necessary commands, and receive data all within an easy to
user, plot and analyze the data to interpret the signals that were received.
and easy-to-read interface.