Muscle Cramp Detecting Wearable Device

SCOPE OR CHALLENGE STATEMENT

Early detection and diagnosis of **muscle cramps** is especially helpful for athletes and receive the appropriate care. The idea is to develop a non-invasive wearable device that disclose muscle cramps using **Near-infrared spectroscopy** (**NIRS**).

IMPLEMENTATION

The device would compute lactate threshold, hypoxia (low levels of oxygen in body tissues), and blood electrolyte levels (sodium, potassium, and chloride), and the indispensable data would be analysed to deliver a pertinent result on muscle cramping.

The spectroscopic technique makes advantage of the electromagnetic spectrum's **near-infrared area** between 780 and 2500 nm.

By implementing the datasets to a decision tree. We can implement **Random-Forest** Algorithm as it has applications with computational biology to review the different sets of data and to produce a decisive result on muscle cramps.

STRENGTH

earlier prediction of muscle cramp.

a non-intrusive method.

a higher accuracy rate.

real-time results reporting.

cost effective

WEAKNESS

not including electrolyte levels.

Results are dependent on assumptions.

can only determine when a cramp will occur, not the actual muscle.

OPPORTUNITIES

useful in the realms of sports and athletics.

can be combined with NIRS devices that currently exists.

to prevent injuries as swiftly as feasible

THREATS

data protection.

There are times when it's less predicative.

FEEDBACK

Mentors had cleared up a lot of our queries and steered us in the correct direction; the positive feedback encouraged us to proceed. After carefully weighing all of the possibilities, we developed the idea of creating a machine learning model that can be built as a software module that can be coupled with existent NIRS devices.