COM S 573: Machine Learning (Spring 2021)
Project Proposal

1 Project Title

Prediction of the individual with over-weighted based on the center of mass acceleration data during the gait cycle.

2 Team Members

- Yu-Pin Liang

3 Project Details

3.1 Project Objective

Please describe your project objective in this part.

- What is the project Objective? An algorithm that can predict the personal whether over-weighted or not based on Accelerometer data, Gyroscope data, and Magnetometer of human body during gait cycle.
- What problem to solve? Does the over-weighted body size change the gait from normal pattern to abnormal pattern?
- Why the problem is important? If the gait pattern change, this imply that the whole body kinematic and kinetic chain are also changed. That kind of changes will lead to alternate the joints force and some pathological effect.
- Why machine learning can help to solve the problem? By using SVM, the over-weighted identifying problem can be solved.

3.2 Datasets

Please describe your dataset in this section.

- What is the data and where you obtain it? This is a on going project, the data is mainly from Biomechanics Lab
- How the data is collected? The Inertial Measurement Unit was placed at knee and lower back when the subject was walking.
- What will be the features and labels you will use? Features: acceleration data in three different directions Label:Over-weighted or not
- How many examples for training, validation, and testing? training:50 validation:10 testing:20

3.3 Machine Learning Algorithm

SVM Machine
Please justify your selection. SVM machine is a good classifier for the binary problem.

3.4 Expected Outcomes

What is your expected outcome for this project? We can know if the center of mass acceleration change for the over-weighted population.