Overview of Project Idea

My project is focused on finding and identifying positions in combat sports, specifically Brazilian Jiu-jitsu, freestyle wrestling or Judo (grappling arts), through machine learning (potentially semi-supervised learning). I intend to gather my own primary data wherever possible, either through the use of inertial sensors, or cameras and action recognition (computer vision) software.

The primary idea behind the project is to create software that is able to distinguish between the various grappling positions when fed data from two subjects engaging in a bout. The software may also have the capability to identify different submissions, takedowns and counters; details of this, or how feasible this is, are currently unknown. As a practitioner of the sports, I wish to use my own data and the data of a consenting partner wherever possible, and hope to gather data for people of varying body types, to maximise diversity and accuracy.

This data may then be applied for a variety of purposes – for analytical purposes (evaluating what a player could improve about their game), refereeing purposes (scoring players and keeping track of scores, as well as ending the bout if a submission occurs), educational/teaching purposes (pointing out the names of moves and potential counters/escapes), or evaluation purposes (sort of like a chess engine, evaluating which player is winning/has advantage at a point in time).

There are many potential routes I could take, and at this early on in the project, I have not decided what route to take – it’s possible that I may focus strictly on ground-fighting and analysis of ground-fighting, since it’s a much deeper and more complex form of combat. I train all three sports and know a lot of people who also train, some of whom have already made it clear that they would be happy to be involved in this project.