**Daily Log Project M.Sc. ECMM451**

**Student Name: Mark Ebel**

**Project Name: Predicting athletic performance**

**Internal Supervisor: Diogo Pacheo**

**External Supervisor: Matthew Black**

**Daily Log of Activity**

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| Date: | Activity | Outcomes | Comments |
| 08/02 | First meeting | In this meeting I met Diogo, we both introduced each other and he briefly introduced the project and potential uses if the work is successful | He also mentioned that the work will be used for future grant applications to continue the work and it was a proof of concept project more than producing an application. |
| 16/02 | Kick off meeting | This meeting I Diogo introduced me to Matthew. I learnt the aims for this project to enable real world monitoring with particular emphasis on the use case in long distance cycling due to the races having sprint stages. The 3 minute test was introduced as a test of the power output of an athlete. Critical power was also introduced and W prime. The disadvantages of the 3 minute test were also discussed. | Matthew and Diogo are big fans of their cycling/spin classes and suggested long term they could online shared races to gather a large dataset. Critical power is a threshold associated with power output. When this power level is exceeded the energy reserve of an athlete starts to decrease. W prime is the energy reserve. The disadvantages of the 3 minute test were: it cannot be performed during a race, and as it is exhaustive is not good to do before a race. Matthew also suggested it would be useful for me to do these tests. |
| 18/03 | Ramp test | I went to St Luke's campus and performed a ramp test. Discussed other work and the facilities. The initial dataset was talked about and to be sent over. Matthew mentioned a large dataset was not as necessary and the accuracy of the machines used to perform the tests was high. It also showed me that they had to be calibrated before each test. | This test will be used for the 3 minute test. I had a mask on for my VO2 to be measured and then cycled on a spin bike. The resistance slowly increased during the test until I couldn’t push the pedals at any real speed. I was not tired after the test, my legs ached a bit (pumped full of blood feeling), but cardiovascular and respiratory systems were fine. |
| 22/03 | 3 minute test | I attended St Luke’s campus. The setup was similar to the last test but the cycling machine was setup for the resistance to be constant instead of changing. This resistance was calculated from the ramp test. | Hell. The test was definitely to exhaustion. Matthew shouted (motivated) at me to continue to cycle as hard as possible. He said it was a useless sample if you take a break halfway through. I understood the limitations of the test. |
| 25/03 | Project proposal | On the 09/02, I received a IDSAI Research Awards application created by Diogo and Matthew. From helped me form the project proposal. | Created the basic scope and objects of the project as well as formally introducing the background. |
| 30/03 | New features - derivates |  |  |
| 06/04 | PCA/LDA |  |  |
| 13/04 | Finding peaks |  |  |
| 11/05 | Oversampling |  |  |
| 18/05 | Analysis of different errors |  |  |
| 25/05 | Baseline model |  |  |
| 1/06 | Binning values |  |  |
| 8/06 | Save/Load model |  |  |
| 22/06 | Looking at graphs of each feature over time / exploring the data |  |  |
| 29/06 | Data preprocessing |  |  |
| 06/07 | Test train split |  |  |
| 13/07 | Grouping samples |  |  |
| 27/07 | Combining all into one function |  |  |
| 03/08 | Presentation |  |  |
| 10/08 | Report |  |  |
|  | Report |  |  |
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24 weeks in total to summaries what happened

Remember to write it like a diary. This week I did such and such…. Today….

Holiday:

Yorkshire – Caving: 14th April - 18th April

Austria - Kayaking: 10th June - 19th June

Salsa festival - 14th July– 18th July