School of Computing 

COMP5200M Project Specification

***NOTE to student****: ensure you have discussed the content with the supervisor. Submit an* ***electronic version*** *of this form in pdf via the COMP5200M module page on Minerva; with filename of the format WENJIE23-Spec ( e.g. SMITH17-Spec.pdf).*

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| **Student Name: Wenjie Zhang** |
| **Programme of Study: Advanced Computer Science** |
| **Supervisor Name: Toni Lassila** |
| **Name of External Company** (if any)**: None** |
| **Type of Project:** |
| **Provisional Title of Project:**  Machine learning classification of aneurysms using imaging and simulation data |
| **Aim of Project:**   * Design and create Machine learning and Deep learning classifier model that classify cerebral aneurysms, base on the input data (morphological features of different cerebral aneurysms and simulation-derived features), give out a predicted succeed probability of the treatment by endovascular flow diversion. * Compare these model, and improve the model that gives the best accuracy, then train the model again |

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| **Objectives:**   * Background research on previous similar projects to generate a basic idea * Understanding the data by give research on the data * Choose and collect suitable data for model training from a different website * Background research on different Deep learning and machine learning model, aim to choose suitable classifiers and neural network structures * Design input data types and preprocessing methods for the data * Design prototypes of different Deep learning and machine learning model * Use Python to create the preprocessor for the original data, so that data can be input to the model * Use the Python libraries torch and sklearning to create the models * Train and test the models with the preprocessed data, and give labels to different cerebral aneurysms. * Conclude the result by observing the prediction accuracy to evaluate different models * Change the structure of models and see if there will be some improvement in the prediction accuracy * Evaluate the models again, repeat the processes a couple of times * Write the final report that compares the different models and concludes the findings |
| **Deliverables:**   * Final report * Python Code * trained deep learning or machine learning model * Excutebale software that visualize the algorithm |