

Reflection

My contributions to the project

Situation

Do a research on classifying patients with similar diagnosis using data generated by flock of birds data. The data contained an idle (stationary data) at the start and end of the exercises.

Task

In order to detect and remove this stationary data automatically, a script needed to be developed. I took this task upon myself. Read papers on the diagnosis of musculoskeletal disorders, e.g. the paper written by the previous group.

Follow the machine learning and deep learning lectures and read useful materials on these topics that are available online. Ask fellow students from programming background for advice and to remove errors from my code. Try deep learning neural networks to classify the patient groups.

Action

I wrote a python script that can detect and removes a stationary data at the start and end of an exercise. I also developed a Convolutional neural network (CNN) model to predict the right patient group.

Results

The Remove idle was successful in detecting an idle in most the cases. The results (65% accuracy) were however in comparison with the best configuration, (69%) not that good. The CNN showed to be a promising model in predicting the right patient groups. The model predicts with a 72% accuracy the right patient group. Furthermore, the CNN model is better in predicting patient group 2 which the logistic regression failed in.

Reflect

The Remove Idle function worked well and therefore removed biases in that a model could have been overfitted on. I advise future projects to also consider removing the idle first before trying a predictive model. The CNN was very good in differentiating patient group 2 from 3 since it's a more complex model then logistic regression.

Next time I would like to spend more time in model configurations, rather than making more data representations.

Transfer

I would like to advise the next ortho eyes project group to look into CNN, since it has more capacity in detecting minor difference between patient groups.

My own learning objectives:

Situation

My background is civil engineering and I do not have any programming skills. My main objective is to get a grip of Data Science concepts and be able to use existing techniques to reach a more reliable and factual conclusion.

Task

Pass the written test which proves that I at least know the basic concepts of Data Science. In order to do this, attend most of the machine learning lectures and make summaries during the lecture.

Furthermore, follow all the DataCamp courses in order to understand and implement python scripts.

Follow an online course on deep learning course to understand the basic concepts of it and how its implemented.

Build a machine learning model on the left and write limb data of an exercise for practice.

Learn how to write a research paper in order to write one.

Action

I completed DataCamp course and an online deep learning course on Udemy. I also attended most of the machine learning lectures and made useful notes on the topics. I built a logistic regression model to classify the left and right limb data of an exercise for practice. For the research paper I read a couple of papers on the subject and did a lot of discussions with my project group.

Results

With my python skills, I can write python script, like the Remove idle function. I am also able to train a machine learning model and a CNN neural network. I Can validate and evaluate the results of a model and make sound judgements based on these results. Furthermore I passed the written test exam with 8.3/10.

Reflect

Developing my Data Science techniques, e.g. model and evaluation metrics helped me pass my written exam test and contribute to the project group on doing the research. The amount of effort I have stopped into this minor is a lot since I had to learn everything from scratch. I am happy with the results I got so far and how far I have come.

Next time I would like to spend more time in doing literature studies in the field of the research.

Transfer

In the future I would like to use predictive analysis in Civil engineering and use the outcome in making better and reliable decision.

Evaluation on the project group:

Situation

The project group consisting of 7 students, by which two were from abroad (Germany and France) were placed in the project group Ortho-Eyes of the minor Applied Data Science at the Hague university of Applied Sciences.

Task

The goal of the project was to do research if by using data recorded by the flock of birds system is sufficient enough in classifying (grouping) patients with different diagnosis using different Data science techniques. Verify the analysis made by last group and build upon their research. To achieve this goals we had to gain domain knowledge in both the medical in field in which we were doing the classification on and in Data Science.

Action

Together we come up with relevant research question and sub questions that helped us in answering the main question. We used scrum frame for planning our research. One of the early tasks we did was develop our python and Data Science techniques. We also read relevant papers on the medical field and Data Science. We had a couple of meetings with the researchers at the LUMC and got more insight in how the data is collected and processed. Furthermore, we analysed the steps made by last project group and come to a sound conclusion. We redid their analysis without any assumptions in the data and wrote a research paper on this.

Result

As a project group we worked we achieved our goal in classifying patient groups using kinematic recordings. Every group member had something to contribute to this and bring the project to the right conclusion.

Reflection

As a project group we worked well together, despite our different backgrounds. Working with international students and ICT students was for me a new experience and I learnt a lot along the way. I am happy with the overall achievements of the project group and the specially the research we did.

Transfer

I would like to advise the next ortho eyes project group to communicate better since this a key in achieving better results as a project group.