

**University of the Witwatersrand, School of Electrical and Information Engineering**

**Software and Machine Learning 4<sup>th</sup> Year Investigation Projects**

**Weekly Meeting Minutes**

**WEEK 6: 28 October 2022**

The 6<sup>th</sup> meeting of the Software and Machine Learning 4<sup>th</sup> Year Investigation Projects was held in the 4<sup>th</sup> year Common room. The meeting commenced at 11:10 am and was facilitated by group 22G74, Chairperson Mohammed Haffejee(1435060) and Secretary Thabo Tshabalala(1826096), with assistance from Joseph Baggott(2169705).

**Open Remarks:** Mohammed Haffejee welcomed everyone to the meeting. The meeting began with an announcement from Prof. Estelle Trengove about the details on Open Day which takes place the following week.

**Attendees:**

Supervisors: Prof. Estelle Trengove, Dr. Martin Bekker.

Groups: 22G75, 22G18, 22G15 ,22G51, 22G74, 22G67,22G36,22G90 ,22G48

**Apologies:**

Prof. Scott Hazelhurst

**General Meeting Agenda:** Groups discuss the current week's project progress and next week preparations for next week's Open day.

**Opening Issues and Announcements:**

- **Students are reminded that** Wednesday is the dry run and Thursday is the presentation for Open Day. Students won't be able to physically demonstrate their project in person, but you will need to have good photos. Don't have too much text but have nice photos. It should be able to appeal to a wide range of people, students, etc.
- Students need to explain their projects in such a way that you could explain it to your genius granny. Think about how you would explain your project to the ordinary layman project in a simple and efficient way. The presentation won't count towards the final mark of the project.
- During the interview you need to be clear about what the individual work of the project was. The marks are then decided there and then after you the examiners have gone through all the projects.
- For the posters look at something called better poster. Invariable a bad poster is too in-depth about how the actual algorithm works. Some bullet points and good photos are what you should look for.
- Focus on the report, leave yourself 7 or 8 days to work on the report. You then need to talk about why you couldn't finish.
- Students need to show that you followed an engineering process and how you could do things differently the route that you followed. You need to do a serious introspection of your project, including reflecting on dead ends – this can be used as how hard you worked. The solution didn't just fall on your lap.

## **Students Presentations:**

### **Project 22P101**

Project Title: Facial recognition

Project progress, plan and problems encountered: Yesterday the app was released to retrieve feedback from the cohort group. The aim is 70% accuracy, and this is something that they are achieving. (Accuracy refers to the image that the user returns to the original image). Most of the time was spent on detecting whether the face had glasses, however this was a failure. Finding beards was a success. It hasn't been tested on large data sets, but on smaller data sets have been successful. The beard detection algorithm uses a similar software to find whether users have a mask, and the group is hoping to use this once the last outcome has been achieved. The work has been split, such that half the group

### **Project 22P34, Group 22G67:**

Project Title: Mapping the Rainbow

Project progress, plan and problems encountered:

Discussion on data:

This week the group decided to finally analyse tweets in Johannesburg, this includes likes, mentions ect. Furthermore, the group focused on the tweets within Johannesburg. The group can find all the usernames and they are able to find all the people that they have mentioned last month. However, they were getting users that weren't found in Johannesburg. They have managed to display some graphs for 500 graphs that show the relationships between the users within Johannesburg. The final graph won't be a circle as shown in the demonstration. The issue is that even 50000 tweets is creating a very large graph and so the final graph will be more in depth. The next goal is to show the communities within Johannesburg better in a more visual way.

Final takes from Group:

Final scrape of all the tweets. Going to look at student led protests. Going to use content analysis to find the tweets that don't fall within the correct municipalities.

Note from bekker:

The main challenge of this is how you going to cluster the communities.

### **Project 22P33, Group 22G75:**

Project Title: The lost cities of South Africa.

Project progress, plan and problems encountered:

Plan for the week was to get the ResNet model to work, there were problems with the previous performance of the older models. When it gets to 60% the older model starts to crash. The new model already works better than the previous model and operates at 60%.

Plans for next week:

Feed the model images and when an image achieves 60% confidence, they will move the model to a new folder to be used later. The model can detect kraals with good confidence, higher resolution has better confidence. The front-end part of the system allows the user to upload either a photo or a satellite image and the system will crop to the image of where the kraal is located. The system might be able to return the location if the location is contained within the data. A DATAs set from the South African satellite service could be used.

**Project 22P62, Group 22G48:**

Project Title: Fast Genotype calling

Project progress, plan and problems encountered:

The group explored the different clustering algorithms and have settled on the caymans clustering algorithm. However, this algorithm works well on only small data sets. The problem with the algorithm is outliers, furthermore the issue is that the data sets that are given is larger than what is required by the algorithm needed in the project. The group was given a document that they are using to explore possible future solutions as to how to run the code in the cluster. The aim is to remove the outliers and to be able to run the algorithm on the cluster.

**Project 22P87, Group 22G15:**

Project Title: Cheap Air Quality Reporting Station.

Project progress, plan and problems encountered:

Last week they were discussing tests and evaluations, furthermore machine learning was applied to the learning data. Humidity is causing problems as it is being read as pollution, machine learning is being used to counter act this. They are allowing the microcontroller release wifi which allows the user to access the settings. When high pollution is detected, the device will send a SMS to the operator of a warning.

**Project 22P61, Group 22G90:**

Project Title: Network firewall management and visualisation

Project progress, plan and problems encountered:

Last week struggled to create conversions, hoping to complete the project before the deadline. Furthermore, hoping to have visualisations for open day. IP address is an issue as the model does not see numbers as variables even if you use it as a string variable or an integer.

**Project 22G63, Group 22G51:**

Project Title: Location aware scientific workflows.

Project progress, plan and problems encountered:

Everything is working with slurm, this week there is a focus on testing. The load testing is challenging as the cluster is relatively quiet, as a result the group is going to need to create a backlog. The static and the dynamic characteristics of the loads are very similar. Three tests are run per condition to achieve an average as well as two conditions per test. AWS has been delayed as focus was put on the graphics. Implementing the AWS will be difficult in terms of technicality as well as security. A new library is going to be used determine when load is has been placed on the system.

**Project 22P21, Group G74:**

Project Title: App to scan pool water test strips

Project progress, plan and problems encountered:

**Adjournment:** The meeting was concluded at 12:15 pm by Prof. Estelle Trengove and Dr. Martin Bekker and they gave their final regards.

**Minutes Submitted by:** Thabo Tshabalala and Mohammed Haffeejee.