

SCIENCE FAIR LOGBOOK

January 12th [Introduction]:

By this time, I had begun researching my topic and decided to get a brief overview of my entire project so that I would know how to map out all the components of the presentation.

I've noticed the development of AI, and its uses nowadays. If AI could be used to detect early symptoms of Alzheimer's, it would help with medication later on, possibly even curing the condition earlier on. It would greatly impact our medical field, which is why I decided to research this topic.

Jan 13:

I'm searching for common symptoms of Alzheimer's, which would include memory loss, difficulty with familiar tasks, language issues, disorientation, visual and spatial issues, problems with planning and problem-solving, withdrawal from public activities or social activities, and changes in sleep patterns. I also searched for some ways that AI can gain this information to diagnose the patient earlier on, which would be using medical imaging and brain scans, cognitive and behavioural assessments, wearable devices for monitoring, etc.

Jan 14:

Today, I checked some articles on how AI could be used for Alzheimer's detection, which was really interesting to read. I learned that using AI models enhances the performance of dementia screening tests since it provides fewer errors and works faster than human input. AI increases the discrimination sensitivity (ability to differentiate between specific items or classes) by 4% and specificity by 3%. In speech pattern tests, the accuracy results of using AI were around 94%, with DLT in brain scan analysis being close to 92%, so using AI does improve efficiency and makes little to no errors overall in all analysis factors. Tomorrow, I'll research more on this and possibly check some dataset models that previous scientists used to train their AI models.

Jan 15:

Today, I checked the dataset models I previously mentioned. The one I used most during this research was [KAGGLE FOR ADNI SCANS](#), which provided me with the MRI scans I needed for my project.

I also searched for images that showcase the differences in scans between mild, moderate, and no dementia, while also using one that differentiates a healthy brain and one with Alzheimer's, pointing out the key differences.

Jan 16:

I started putting this all in my presentation and began writing my description with the introduction to my topic. I also used [MDPI](#) for information on how they trained their AI model using the datasets collected.

Jan 17:

I outlined my presentation, planning out how to explain certain parts, since I need to be able to explain medical scans, neuroimaging, and AI's usage in simple terms. I also started drafting my slides, and am happy with how they're turning out. I added some of the images that I got on January 3rd, uploading them to my presentation.

Jan 18:

I had very little time today to work on my project since I had some volunteer work. I continued working on my presentation, but I wasn't able to find clear biomarker imaging for Alzheimer's, so I had to spend more time searching for some and ended up just not using any for now. I'm a bit frustrated that I couldn't find any that were clear enough, but maybe I might have luck tomorrow.

Jan 19:

Today, I did some research on how AI is already being used in the medical field, which gave me a clearer understanding of how much this helps patients receive treatment sooner than usual, which also reduces the risk and possible severity of the issue or disease. This may not be the case with all diseases, but it definitely helps to get help earlier so we have a greater chance of treating the patient.

Jan 20:

I decided to practice the speech I'll be giving in the presentation while also typing up some of the information that has to be in the explanation. I went over a couple of different key points and worked out how to explain everything concisely while also being clear and direct. This helped me solidify my voiceover for the presentation. Now, I just have to finish working on my slides.

Jan 21:

I'm pretty much done, I just need to wrap up my work and later upload all data and information to the presentation and D2L shell [and CYSF].