The Machine Learning module has been varied in terms of activities and topics, which is why I think it is one of the most intellectually stimulating modules of my academic journey so far. While I did have some prior exposure to programming and some basic data analysis skills, this module took a much more complex turn. Although it was challenging to navigate both a job and learning about such difficult concepts, my overall feeling is positive, because I can see that my critical thinking has sharpened and I can understand difficult concepts more easily.

The first hands-on task that I completed was a correlation and regression activity. At first, I found the idea of “changing variables” a bit vague, since at first glance the variables looked randomised, but I began experimenting with different combinations and it soon became clear that the way you choose to randomise them is purposeful, giving you room to experiment.

Tackling the Jaccard coefficient activity left me stumped because, at face value, it was a simple exercise where you had to translate a mathematical idea into Python code, which is relatively straightforward. Still, doing the calculations manually and then running a test code proved that either I or the machine had misunderstood the task. Of course, I was the creator of the code, meaning that it was I who needed to properly adjust it. This introduced me to the challenge of defining similarity and variables, which is something I had never previously questioned beyond surface-level intuition.

Perceptrons and sigmoid functions sounded like a difficult subject at first glance, and although the concepts were complicated, the activity proved to be rewarding. Because the learning was rooted in experimentation, I had the opportunity to actually visualise mathematical formulas and review my understanding. I spent a fair amount of time adjusting the parameters to observe how the perceptron behaves and how it learns to classify data. As much as it is innovative, the perceptron is only the first step into the world of Artificial Neural Networks (ANNs), and fully grasping the concepts behind it meant that later reading was clearer and easier to digest.

One of the bigger early-module tasks was the group project. I participated early on with organising and coordinating activities such as identifying the primary questions, breaking down the project into smaller tasks, setting up task distribution, and eventually contributing to reviewing the code and writing the final report. The whole situation was quite stressful, group projects did not seem so complicated before, but dealing with grown adults with jobs and families turned out to be delicate. The main issue was with schedules; more often than not, they did not align, and participating in the video calls became difficult after the first few sessions. Of course, there were issues with the coding, the task was laborious, and I, for one, did not have any prior experience with writing such lengthy Python code. In hindsight, the most valuable part was learning to work with multiple people from diverse backgrounds and complicated lives, and making the most out of what little time you have for learning to navigate the group dynamic. I have never been one to take charge, and the whole experience of remote studying pushed me further into my shell, but this project taught me to communicate more clearly and embrace the role of shared responsibility.

An area I have always seen as a minefield is ethics, and we had plenty of ethical discussions around AI in this module. On one occasion, we were asked to reflect on an article about Robo-writers, bringing our own input to the conversation. I believe this topic was extremely interesting, which is why I can definitely say this was the first time I have enjoyed writing a text focusing on the ethical aspect of an issue. Through my research, I found many thought-provoking ideas, things that I was not even aware of, which highlighted the need to stay more in touch with current trends, as the field is rapidly evolving. My initial forum post about Robo-writers focused on opportunities and the very real challenges that come with them, still maintaining a positive tone. However, by the time I wrote the summary post, my view had become a little conflicted. As a takeaway, I am truly of the opinion that tools like GPT-3 or newer models are useful and can be excellent companions across multiple fields, but I am now increasingly anxious about how delicate the issue of implementation is. Reading the Wall (2019) article simply reinforced the idea of bias in machine learning models. Just as LLMs are capable of showing racial and gender bias, so too can a CNN model trained to classify images. The same issue persists: training ML on flawed data propagates the same stereotypes humans propagate. This made me realise how closely intertwined machine learning is with morals and social responsibility.

The final project was challenging, but proved to be easier than expected thanks to my experience with the group task. Using the CIFAR-10 dataset, I built my own CNN algorithm and incorporated a pre-trained model named VGG16. I was a bit intimidated at first, but once I began to research and gather documentation and tutorials, I realised it was manageable. I consider myself a perfectionist, and this task really put that to the test. I quickly had to come to terms with the realities of coding coupled with high computational cost. The idea of not knowing whether your result will be “good enough” frustrated me at first, but I believe that’s what made me appreciate it more when I finally submitted the project, feeling like I truly understood my work. The concept of a learning rate, for example, was something I understood better because I had watched what happens when it is not appropriately set.

The biggest outcome from this module is deconstructing how I think and learn. All of the small experiments we had to do shifted my very methodical and know-it-all approach. I have also started paying more attention to the ethical implications of technology and have grown to enjoy the challenge of discussing them. Lastly, I have realised that machine learning is a field that is constantly evolving and, while keeping up with it might be difficult, it is also rewarding.

References:

Wall, M. (2019) ‘*Biased and wrong? Facial recognition tech in the dock’.* Available at: <https://www.bbc.com/news/business-48842750> (Accessed 21 July 2025)