Identifying project

My main issue with identifying the subject matter for my project was setting an appropriate level of complexity. This was partly caused by the insufficient amount of research I carried out prior to settling on this project. This unfamiliarity with the subject matter led me to make a range of incorrect assumptions. I think if I looked deeper into the task I was preparing for, I would have either simplified the objective or selected a different project.

Designing project

I broke my objective down into ten tasks at the beginning of the project. But this had a flaw. The tasks I chose were not sufficiently decomposed, meaning that deciphering the volume of work and exact tasks to complete in each week to keep up with deadlines was difficult.

Planning project

Initially, I considered some of the obstructions that would be likely to impede the progress of my project. However, I did not foresee some of them, such as the DofE practice expedition. Also, I didn't look at my time management on a smaller scale. I designated weeks of the project to specific tasks, but I didn't incorporate the project into my weekly routine. Finally, my initial plan was very optimistic. I am now aware that any task typically takes much longer than one estimates before carrying it out. Throughout the project, I also frequently returned to my plan for the management of the remaining project time, which I think was a strength of this project. However, the way in which I responded to interruptions to my project or missing deadlines was inefficient. Perhaps the way in which I revised my plan for the project still suffered from other issues which I did not identify. For example, focussing on the 'big picture' of the project exclusively, where I should have gone further and broken tasks down as much as possible: to the point of knowing exactly what I must do in each hour of work.

Project execution

Documentation

Overall, I think I captured most of the events of the project in the documents I produced. The journal contains the most of my thoughts, reflections and notes from research. However, I could have made it more cohesive by adding more justifications for my thought process and my decisions in greater detail. The journal also contains the programs I produced throughout the project descriptions of their function. This gives an idea of what I was aiming to do with my code, however, most of the programs do not contain embedded annotations, which would explain the function of the programs more clearly and in greater detail.

Adjusting to obstacles

Throughout the project, I demonstrated initiative to explore a range of solutions to roadblocks I encountered. For example, I discovered that the Arduino's processor was incapable of executing the machine learning models I ambitioned to use. As a result, I decided to offload the processing of the machine learning model from the Arduino to my personal computer. On a smaller scale, I decided to change the ultimate function of my artefact from recognising faces to simply detecting faces. However, a weakness of the project was the lack of primary research I carried out. I think that seeking out discussions about the subject matter of my project could have helped substantially with several aspects of my project. Engaging in discussions with peers or teachers may have led me to consider more potential directions in which my project could move, especially in relation to issues and roadblocks I encountered. In future, I will be sure to be more conscious of this and the benefits it may bring.

Organising information

Notes

These were made inconsistently, as they were made alongside research. At times, I was not entirely sure what to keep track of without the luxury of hindsight. In future I should try to summarise the days' worth of notes after research, so they make more sense in future. Another improvement would be including in-text citations for notes. I did not do this for my project, as I viewed citations as a final touch one adds to a document. In future, I should be more vigilant of this and use tools that facilitate the process. For example, I adopted the use of a piece of reference management software named Zotero. This made organising my citations and bibliography much easier to pull my portfolio of work together. However, I now see that they are instrumental to keeping track of where information comes from and when it was accessed. This helps tremendously with summarising the events and motivations of the project afterwards.

Journal

This part of my portfolio which consists of all my rough working and thoughts I kept track of as my project developed. As a result, the organisation ranges from detailed explanations of concepts I encountered in my research to disjointed notes. To preserve the sense of continuity throughout the journal, I included a short summary of the information the rough notes explain. Additionally, I included in-text citations where appropriate throughout the document.

Report

This part of my project is more logically structured than others, providing an overview of my project with the necessary background, theory and events required to understand it. However, one of its weaknesses is its abrupt end to the methodology and findings, which came about because I did not include events from June to August, since they did not produce any sort of result which I could discuss.

Applying information

I applied information to developing my artefact logically, but I was not cautious enough. I made some assumptions based on a great depth of research in some areas, and shallow research in

others. For example, I investigated how the camera module sends and receives data. However, I made an incorrect assumption about how the Arduino communicates over Wi-Fi based on minimal evidence.

Taking decisions critically

My thought process and decision-making process was linear and constrained. I considered several directions I could move in at many stages of the project; however, I think they were limited by my own knowledge. If I engaged in discussions with peers or teachers about my project as it developed, I think my horizons would have broadened a little more. This would have allowed me to make slightly more balanced decisions, by being able to consider more options.

Outcomes related to objectives

The artefact I set out to create is incomplete. However, progress was made toward the artefact, such as testing components, creating designs and investigating machine learning theory. For example, I tested the camera module by using a circuit diagram and a test program to extract data from it. However, I found that two programming tools I investigated were incompatible with the processor my Arduino had. Another test I carried out was with a programming tool to enable Wi-Fi communication between my computer and the Arduino. The tests on my computer were successful, however, a similar test on the Arduino did not show the expected result. Overall, I think most of the outcomes of the project were those with respect to research and my own learning.

Outcomes related to learning

Over the course of the project, I developed in many respects, which link to the aims I set out to achieve at the beginning of the project. For example, I learned how to create and apply machine learning models to problems with the TensorFlow library for the Python programming language. I developed my knowledge of machine learning theory, exploring topics such as Markov decision processes, the parts of a supervised machine learning model and neural networks, as well as some of the statistics which underlie machine learning models. I practiced the exercise of assessing the validity of the information I consume. This typically involved researching the authors or organisations responsible for a publication and searching for any vested interests or other sources of bias which could impact the validity of the source. I learned a little more about electrical circuits by finding out how to use a breadboard. Throughout the project I learned my weaknesses in organising a long-term project and time management. I improved in C++ and learned a little C, by creating programs for the Arduino and examining the files of two libraries I planned to use for my artefact. To my surprise, I ended up using more Python than C++, because of the API centred second design. Also, I did not do as much programming as I expected to. However, I did not do any primary research. I think looking for people to talk to about what I had been doing or issues I was encountering could have allowed the project to develop much more quickly and allowed me to move past many of the roadblocks I found myself challenged with over the course of the project. Additionally, the research I carried out was

inconsistently deep. I made many strides in learning about statistics and mathematics, but in terms of theory that could be directly applied to practice, I didn't find much.