Title page

# Introduction

* How the report is laid out
* The 180-hour work plan was in correct and a new one was constantly being drafted to match the work available.

The purpose of this report is to describe and critically evaluate the work produced during the 180-hour placement that was undertaken at Edinburgh Napier University. The report provides an overview of the research topic and its relation to the current computing industry. Next, it presents a skill audit which demonstrate the skills and techniques and skills that were learned, used and developed throughout the project. This is followed by the project artefact sections which will further provide evidence of the work undertaken. The penultimate section of this report contains a critical evaluation of the placement and the appendices will form the last section of this report.

# Context

The project undertaken was a research topic regarding facial recognition with an emphasis on jaw movement. There were constraints on the project which involved it being developed in the Unity engine and using the OpenCv (Open Computer Vision) library. Furthermore, documentation regarding the project and what has been researched was to be produced and handed in at the end of the placement. The client for the research project was Gregory Leplatre, a lecturer at Edinburgh Napier University.

Due to the nature of the research project, following the 180-hour work plan was not feasible as it was difficult to estimate how long each stage of the project would take. Thus, this plan was modified and has been supplied along with the original work plan that was submitted. Further information of this is provided in the project artefact section.

The duties as a research student included:

* Documenting research done.
* Provide sample solutions.
* Weekly meeting with client to discuss work.
* Something to make list look more impressive.

# Skills Audit

One of the key assets that I brought to this research project was my understanding of algorithms and code complexity. This was essential in quickly identifying what algorithms should be used over others to have a well optimised solution. For example, when it came to converting an image from the Unity Texture2D to a Mat image, several solutions were possible. One of which involved nested for loops. This was quickly identified as a performance issue and an improved solution was quickly introduced instead. Another instance of my knowledge of algorithms proved to be useful was when researching how the OpenCv functions were implemented, for example the Haar Cascade function. I identified how the function worked and what limits should be imposed on it to keep the project feasible in real-time.

Another skill that I found useful while undertaken this project was my knowledge of computer graphics. The knowledge that I got from the ‘Computer Graphic’ module helped me to understand how the post processing worked on image manipulation. This was essential for face detection, as the previous steps before detecting objects was turning an image to grayscale, followed by equalising the histogram.

A major technique that I used to make consistent progress throughout the project was the agile method. I limited myself to weekly sprints in which I gave myself an aim to achieve. This was used in conjunction with the MOSCOW method, in which, you prioritise aspects of your program in the following order: Must have, should have, could have, won’t have. An element of the project can shift columns in the MOSCOW structure. This benefitted me as it provided structure to my research topic and helped me focus on what should be done next as I was working independently.

When an I initialise an agile sprint the first stage is to identify what the aims of the sprint is, after that has been decided I follow it up with research on the area, I record my research into a document (appendix 2?). Once the document has a rough draft, an implementation is attempted. As the deadline of the sprint is approached, I review my implementation and determine if it is being a suitable result. The outcome of this is recorded into the document and other alternatives are looked at.

* Agile – weekly sprint, adapted the Moscow formula to prioritise what I needed to do each week.
* Problem Solving.
* Time management.
* Research and documentation.
* Image manipulation.
* Code optimisation.
* Working independently.

# Project artefacts

* Document
* Code snippets
* Emails?
* Sketches
* Texture conversion (nested for loop vs memory stream).

# Log Book

* Original one
* New one
* Why changes were made.

# Evaluation

* Struggled with work at start
* Started to gain more consistency/ confidence working on my own.
* Documentation could be improved more.

# Appendix