1.1 Bsc (Hons) Software Engineering Learning Outcomes

- Demonstrate an understanding of the principles of object orientation in the context of analysis and design.
- Apply project management techniques in order to plan, monitor and control a project.
- Explain and utilise fundamental object orientation concepts such as classes, encapsulation, inheritance and polymorphism and relate them to their practical situations including library and graphical user interface (GUI) development.
- Utilise in-depth, practical experience of the types of software tools that can support an object-oriented software lifecycle and develop this through practical experience.
- Utilise and understand methods and appropriate software tools for software development, including Software Testing Tools, Version Control and Project Management.
- Demonstrate an understanding of the fundamental, basic issues of software testing.
- Evaluate and apply design patterns for the development of high-quality, object-oriented software systems.
- Build robust, secure distributed systems using techniques such as messaging, persistent storage, remote methods and components.
- Have a range of programming skills to apply in the software engineering environment.
- Demonstrate that they can participate in and complete a substantial project, involving research, planning, specifying, designing, building and testing software, integrating knowledge gained from the core units on the award.

(MMU, 2017)

1.2 Project Background

Image classification in static images is one of the most popular subjects of research within the computer vision field. It involves letting a computer program look at an image and let it try to guess what it contains. Its applications are far-reaching including areas such as filtering images via content **(Vailaya et al., 2001)**, which could be used in web image search, or searching through local photo libraries. While much research has already been done into the area, it is still fast developing and only recently have major consumer applications started to make use of image classification. For example, 'Quick, draw!' is an online game which prompts a user to draw a certain object on the screen, then using image classification techniques it tries to guess what a player has drawn **(Quickdraw.withgoogle.com, 2017)**. While the task of recognising a certain object within an image is generally trivial for a human