# **Higher Nationals**

# **Assignment Brief – BTEC (RQF)**

**Higher National Diploma in Computing**

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| **Student Name /ID Number** | Aaron Mascarenhas |
| **Unit Number and Title** | **Unit 27 – Artificial Intelligence** |
| **Academic Year** | **2018- 2019** |
| **Unit Assessor** | **Gurjeet Singh Kohli** |
| **Assignment Title** | **Secret Intelligence Service MI6 - Implementation of an Criminal Detection System** |
| **Issue Date** |  |
| **IV Name** | **Nital Patel** |
| **Draft submission date** |  |
| **Final submission date** |  |
| **Re-submission date (if required)** |  |

**Plagiarism**

Plagiarism is a particular form of cheating. Plagiarism must be avoided at all costs and students who break the rules, however innocently, may be penalised. It is your responsibility to ensure that you understand correct referencing practices. As a university level student, you are expected to use appropriate references throughout and keep carefully detailed notes of all your sources of materials for material you have used in your work, including any material downloaded from the Internet. Please consult the relevant unit lecturer or your course tutor if you need any further advice.

**Student Declaration**

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| **Student declaration**  I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.  Student signature: Aaron Date: 11/02/19 |

**Learning Outcomes and Assessment Criteria**

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| --- | --- | --- | --- | --- | --- | --- |
|  | Grading Criteria | Met | Grading Criteria | Met | Grading Criteria | Met |
| **LO2** | P3 |  | M2 |  | D2 |  |
|  | P4 |  |  |  |  |  |
| **LO3** | P5 |  | M3 |  | D3 |  |
|  | P6 |  |  |  |  |  |

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| **Assessor Feedback:**  \*Please note that constructive and useful feedback should allow students to understand:   1. Strengths of performance 2. Limitations of performance 3. Any improvements needed in future assessments   Feedback should be against the learning outcomes and assessment criteria to help students understand how these inform the process of judging the overall grade. Feedback should give full guidance to the students on how they have met the learning outcomes and assessment criteria. | | | | |
| **Grade:** | **Assessor Signature:** | | | **Date:** |
| **Resubmission Feedback:** | | | | |
| **Grade:** | | **Assessor Signature:** | **Date:** | |

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| Submission Format: |
| 1. The submission is in the form of an individual written report. This should be written in a concise, formal business style using single spacing and font size 12. 2. You are required to make use of headings, paragraphs and subsections as appropriate, and all work must be supported with research and referenced using the Harvard referencing system. 3. Please also provide a bibliography using the Harvard referencing system. The recommended word limit is 1,500–2,000 words for the individual reports, although you will not be penalised for exceeding the total word limit. |
| Unit Learning Outcomes: |
| LO2/3 Implementation of an AI model using Bottom up and top down approaches |
| Assignment Brief and Guidance: |
| **Case Study – Security Service MI6**  Image result for mi6 logoImage result for met police logo  You are working within the London Metropolitan Police Service as a part of their Crime prevention unit. As more and more crime is occurring on London/UK streets the London Met has created a joint Intelligence unit with MI6. The Met Police did not have the current funding to develop an Artificial Intelligence Criminal Face Detection application. You have been deployed within a Special AI Crime Prevention task force to develop an AI model which detects Criminals in real time video feeds.  Central London is a hub where a lot of Criminal Activity takes place based on the Metropolitan Police. Central London has an approximate 500.000 CCTV camera deployed onto Londoners 24/7. The Intelligence Service recommends that an AI application could be injected within the CCTV feed and the AI could detect Criminals and pin point on London Map by sending the GPS locations to the nearest Police patrolling the area. Below are the number of CCTV cameras deployed on London’s Top 10 Underground Stations.   |  |  | | --- | --- | | **Underground Stations** | **No. of CCTV cameras** | | **Oxford Circus** | 309 | | **Waterloo** | 303 | | **Green Park** | 210 | | **Elephant & Castle** | 190 | | **Bank/Monument** | 182 | | **Westminster** | 177 | | **Piccadilly Circus** | 175 | | **Wembley Park** | 171 | | **Canary Wharf** | 167 |   **Secret Service MI6 - Background**  The Secret Intelligence Service (SIS), commonly known as MI6, is the [foreign intelligence service](https://en.wikipedia.org/wiki/Intelligence_agency) of the [government](https://en.wikipedia.org/wiki/Government_of_the_United_Kingdom) of the [United Kingdom](https://en.wikipedia.org/wiki/United_Kingdom), tasked mainly with the covert overseas collection and analysis of [human intelligence](https://en.wikipedia.org/wiki/Human_intelligence_(intelligence_collection)) (**HUMINT**) in support of the UK's national security. SIS is a member of [the country's intelligence community](https://en.wikipedia.org/wiki/British_intelligence_agencies) and its [Chief](https://en.wikipedia.org/wiki/Chief_of_the_Secret_Intelligence_Service) is accountable to the country's [Foreign Secretary](https://en.wikipedia.org/wiki/Secretary_of_State_for_Foreign_and_Commonwealth_Affairs).  Formed in 1909 as a section of the [Secret Service Bureau](https://en.wikipedia.org/wiki/British_Secret_Service_Bureau) specialising in [foreign intelligence](https://en.wikipedia.org/wiki/Foreign_intelligence), the section experienced dramatic growth during [World War I](https://en.wikipedia.org/wiki/World_War_I) and officially adopted its current name around 1920. The name MI6 (meaning [Military Intelligence, Section 6](https://en.wikipedia.org/wiki/MI_numbers)) originated as a flag of convenience during [World War II](https://en.wikipedia.org/wiki/World_War_II), when SIS was known by many names.  It is still commonly used today. The existence of SIS was not officially acknowledged until 1994. That year the [Intelligence Services Act 1994](https://en.wikipedia.org/wiki/Intelligence_Services_Act_1994) (ISA) was introduced to Parliament, to place the organisation on a statutory footing for the first time. It provides the legal basis for its operations. Today, SIS is subject to public oversight by the [Investigatory Powers Tribunal](https://en.wikipedia.org/wiki/Investigatory_Powers_Tribunal) and the [Parliamentary Intelligence and Security Committee](https://en.wikipedia.org/wiki/Intelligence_and_Security_Committee_of_Parliament).  The stated priority roles of SIS are [counter-terrorism](https://en.wikipedia.org/wiki/Counter-terrorism), [counter-proliferation](https://en.wikipedia.org/wiki/Counter-proliferation), providing intelligence in support of [cyber security](https://en.wikipedia.org/wiki/Cyber_security), and supporting stability overseas to disrupt terrorism and other criminal activities. Unlike its main sister agencies, the [Security Service](https://en.wikipedia.org/wiki/MI5) (MI5) and [Government Communications Headquarters](https://en.wikipedia.org/wiki/Government_Communications_Headquarters) (GCHQ), SIS works exclusively in foreign intelligence gathering; the ISA allows it to carry out operations only against persons outside the [British Islands](https://en.wikipedia.org/wiki/British_Islands). Some of SIS's actions since the 2000s have attracted significant controversy, such as its alleged acts of [torture](https://en.wikipedia.org/wiki/Enhanced_interrogation_techniques) and [extraordinary rendition](https://en.wikipedia.org/wiki/Extraordinary_rendition). Since 1995, SIS has been headquartered in the [SIS Building](https://en.wikipedia.org/wiki/SIS_Building) in [London](https://en.wikipedia.org/wiki/London), on the [South Bank](https://en.wikipedia.org/wiki/South_Bank) of the [River Thames](https://en.wikipedia.org/wiki/River_Thames).  The statistical data provided on the next page shows the seriousness of the Knife crime problem within London and the UK as a whole.  http://researchbriefings.files.parliament.uk/documents/SN04304/assets/2151dcfe-7a58-4e89-bf33-6bd0ba6b4bc1.png  **Knife crime statistics**  Knife crime is a persistent and worrying concern, especially as it impacts particularly upon young people and the disadvantaged, and various remedies have been tried over the years. Recorded crimeIn the year ending March 2018, there were around 40,100 (selected) offences involving a knife or sharp instrument in England and Wales. This is the highest number in the eight-year series (from year ending March 2011) the earliest point for which comparable data are available. This is directly related with improvements in recording practices.  HomicideIn 2017/18 there were 268 *homicides* currently recorded using a sharp instrument, including knives and broken bottles, accounting for 33% of all homicides – an increase from the 216 recorded in 2016/17. **Knife crime by police force area**  London recorded the highest rate of 168 offences involving a knife per 100,000 population in 2017/18, an increase of 26 offences per 100,000 population from 2016/17. Surrey had the lowest rate of 5 offences per 100,000 individuals (up by 1 from 2016/17).    **Task 1**  Knife crime and recent terrorist attacks in Sri Lanka have shook the work all over again. The Chief Inspector and MI6 have now decided to tackle this threat with a priority. You have been given the task to develop 3 different Artificial Intelligence systems to put a stop on these kind of crimes. The prevention and early detection of criminals is vital in today’s age to fight terrorism.   * 1. Your first Artificial System you are asked to create is a Static system, which will be used to detect criminals on historic video footage or surveillance pictures. MI6 and the Metropolitan Police have a large archive of surveillance resources in which the known individuals need to be identified and possible links to organised crime corresponded.   Your task is to use the Bottom up approach and develop a Face recognition systems which will use existing pictures for you to identify known individuals so these could be catalogued and relevant acquaintances could be identified.   * 1. Your second AI development task is to develop a Live Face Recognition system for the Intelligence bureau so this add-on can be retro fitted onto Central London’s CCTV network. MI6 and the Metropolitan Police are very keen for this system to be up and running ASAP as they are planning to roll this surveillance measure out for London’s Climate Change Demonstration so activists could be identified and contacted later via letters and consequent action can be taken. Till date, the Police has arrested close to 1000 demonstrators, which was a huge waste of Police funding, and resources, which could be deployed into fighting Knife crime and organised crime.   An example of how your AI should be functioning is illustrated below.Image result for face recognition   * 1. Your last AI System to develop is a Face recognition Blur that will be seeing the use in the Criminal Justice system where Covert Police officers would be giving vital evidence and witness statement of known criminals and criminal gangs. As these Covert Intelligence officers cannot be revealed to the public, you are required to develop a live blur feature, which can be ported onto an existing Face recognition system. An example is shown.   Image result for face recognition blur   * 1. To make sure all these AI systems are running smooth and no errors are present before launching this onto London’s CCTV network you are required to perform an in-depth test by creating Video recordings of you using and testing all these AI models in front of the camera with detailed commentary. You can include one video testing all three models or test them individually and submit these separate videos.   (Note: Phone holders and Tripods are available for you to record your videos on and test the system, Please ask Gurjeet Kohli)   * 1. Within a detailed Report, discuss the functionality of each of these three AI models and their effectiveness towards the suggested use of London’s CCTV network. As you are discussing this functionality and its effectiveness, also mention any future developments, which could further enhance this vital Surveillance tool.   2. Your last report requires you to reflect back on the research, design and implementation phases of your different AI models and justify on how this could have a wider impact on organised crime here in the UK and worldwide. Discuss how this AI model could positively affect society take Sri Lanka’s past attacks in consideration and how an established AI model could be preventing these pointless attacks. Below are some pictures of the attackers, you may use these in your reports.   Image result for sri lanka attack cctvImage result for sri lanka attack cctv  Image result for sri lanka attack cctv |

