**Interim Report**

**Working Title** – Fact-Checking Journalism

**Candidate Number** – 164547

**Supervisor** – Dr Julie Weeds

**Introduction**

With ‘fake news’ being such a prominent topic currently, I’m motivated to create a tool that can help journalists mitigate false information in their article before being published. To go about doing this, I’m going to provide a piece of software aimed at journalists that can be used to fact check their article or document against an external database.

For example, Mark Tucker is currently Chairman of HSBC, but was once the president of an Asian life insurance organisation called AIA Group Limited. Let’s assume a journalist were to submit an article into my software which contained the phrase “Mark Tucker, who is currently president of AIA, was seen leaving his house yesterday…”. I aim for my software to be able to flag this phrase up to the journalist and display all previous organisational ties of Mark Tucker, so that they’re aware of any possible misinformation such as this in their article. Of course, ambiguity of names is an issue I’ll have to overcome. There could be, for example, multiple Mark Tuckers, in which case I’d have to either relay this information back to the journalist or identify which Mark Tucker the journalist is writing about.

It’s such an important field to improve because currently, fact checking is human-supervised (meaning news outlets use sub-editors to scan through the journalist’s articles) which is an extremely long and expensive process. In fact, the TAG department at the University of Sussex is currently in talks with News UK to discuss what can be done to make the fact checking process less time consuming and expensive.

Part of what makes my task so difficult is that building a tool that can scan a document and find named entities is no small feat. This is known as Named-entity recognition (NER) and I’ll explain later on in this report how I plan to go about it.

**Project Aim and Objectives**

Rather than scanning for all facts within a document - which may prove inefficient and inaccurate – I’ll focus my tool on fact-checking a specific area of interest about named entities. In particular, I aim for journalists to be able to fact check if their claims about named entities working for a specified organisation are true. Even though I’ve narrowed down my aim to fact checking organisational roles of named entities, the hope is that beyond this final year project, it could be extended to fact checking other aspects of named entities as well.

It should be noted that my focus will be on providing a tool that journalists can manually use to check their facts as opposed to creating an automated service. I intend to do this by providing some sort of link to the external database concerning the fact in question. However, automated fact checking is something I wish to explore as well and is therefore an extension of my project.

As an extension, I would also like to aim this software at readers, so they can fact check articles themselves. However, time constraints will have to be taken into consideration.

**Relevance**

My project is relevant to my degree course as it will display a variety of skills that I’ve learnt so far and will hope to improve on. The focus is to incorporate Natural Language Processing (NLP) and Machine Learning (ML) techniques to perform the fact-checking scan.

Additionally, I’ll be making use of the skills I’ve learnt in Python to code the back end and Java to code the front end. Since I’ve never used PyCharm before, that’ll be a useful skill to add to my repertoire along the way as it’s a commonly used IDE in industry. Finally, some of the project management skills I learnt during the Software Engineering module in my second year will underscore the project.

**Professional and Ethical Considerations**

Below is a rundown of how I plan to approach complying with the BCS Code of Conduct, sections 1 and 2.

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| 1. **Public Interest** | |
| ***1.a. You shall have due regard for public health, privacy, security and wellbeing of others and the environment.*** | |
| Relevance | Since my project is based on public documents distributed by media outlets and databases, I will not handle any personal data (e.g. Tweets or Reddit posts). Therefore, privacy and security will be maintained upon development of my software. |
| My software will have no bearing on public health whatsoever. |
| Approach | I will ensure that my software will not have a detrimental effect on the wellbeing of others. In fact, I aim to somewhat help the wellbeing of others by ensuring that misinformation stemming from journalism is mitigated. |
| ***1.b. You shall have due regard for the legitimate rights of Third Parties.*** | |
| Relevance | Potential third parties of my software include any person who does not directly benefit off my fact-checking tool (i.e. Non-journalists). |
| Approach | A point of emphasis of mine is to protect personal identifiable data to prevent unlawful disclosure and identity theft, per section II of the WP29 guidelines. |
| As per the Copyright, Designs and Patents Act (1988), I will not use any third party material unlawfully. |
| ***1.c. Conduct your professional activities without discrimination on the grounds of sex, sexual orientation, marital status, nationality, colour, race, ethnic origin, religion, age or disability, or of any other condition or requirement.*** | |
| Relevance | Limited relevance to my project. |
| Approach | I will design and build my tool in such a way that discriminates no parties involved. |
| I will conform with the Sex Discrimination Act (1975) and the Race Relations Act (1976) to ensure no discrimination on any grounds. |
| ***1.d. Promote equal access to the benefits of IT and seek to promote the inclusion of all sectors in society wherever opportunities arise.*** | |
| Relevance | I aim to make my tool available and usable to everyone – regardless that my primary users will be journalists. |
| Approach | Although my software is primarily aimed at journalists, the aim of my project is to lessen misinformation among the wider society. I therefore aim to make my software easy to use and useful to all sectors of society. |

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| 1. **Professional Competence and Integrity** | |
| ***2.a. You shall only undertake to do work or provide a service that is within your professional competence.*** | |
| Relevance | Limited relevance since there are certain skills and services that I’ll be learning about for the first time during my project, but are within my professional competence, for example PyCharm. |
| Approach | Not applicable. |
| ***2.b. You shall NOT claim any level of competence that you do not possess.*** | |
| Relevance | All skills and services I claim to possess (such as Python/Java programming, proficiency in NLP/ML techniques etc.) are accurate. |
| Approach | Not applicable. |
| ***2.c. You shall develop your professional knowledge, skills and competence on a continuing basis, maintaining awareness of technological developments, procedures, and standards that are relevant to your field.*** | |
| Relevance | High relevance – as somewhat outlined above, I aim on improving my proficiency with certain skills, competence and knowledge over the course of this project. |
| Approach | In terms of programming, I aim to improve my competence in Python and Java programming languages. |
| I aim to maintain awareness of technological developments in NLP and ML techniques and develop my competence in them to extract best possible performance. |
| Lastly, I will hone my project management skills in order to provide a product that is of high quality and on time. |
| ***2.d. You shall ensure that you have the knowledge and understanding of Legislation\* and that you comply with such Legislation, in carrying out your professional responsibilities.*** | |
| Relevance | As outlined in previous and future sections, I have done my due diligence in researching relevant legislation and will comply with it wherever necessary. |
| Approach | Particularly relevant legislation that I’ll comply with include; The UK Data Protection Act 2018 (GDPR), Computer Misuse Act (1990), Copyright Design and Patents Act (1988). I also plan to adhere to the guidelines in WP29. |
| ***2.e. You shall respect and value alternative viewpoints and, seek, accept and offer honest criticisms of work.*** | |
| Relevance | Highly relevant as I expect to seek, receive and accept criticism of my work from my academic and technical supervisor. |
| Approach | During weekly meetings with both my academic and technical supervisors, I intend to open myself up to criticism and alternative views in a bid to learn as much as possible during this project. |
| Where possible, I aim to offer my criticism of others’ work in the field of NLP/ML. |
| ***2.f. You shall avoid injuring others, their property, reputation, or employment by false or malicious or negligent action or inaction.*** | |
| Relevance | Although my software won’t have the capacity to injure anyone or their property, I must be aware of a journalists’ reputation and employment that may be affected by use of my software. |
| Approach | I will ensure that any journalist using my tool be made aware of its deficiencies and limitations where appropriate. |
| ***2.g. You shall reject and will not make any offer of bribery or unethical inducement.*** | |
| Relevance | Limited relevance. |
| Approach | As per the Copyright, Design and Patents Act (1988), all work that I submit will by my own unless otherwise specified. |
| No bribery or unethical inducement will be carried out. |

Sections 3 and 4 of the BCS Code of Conduct bear less relevance to my project than those outlined above. However, below are some points of emphasis of mine that do relate to the remaining sections in the code:

* As per section 3.a, I will exercise my own judgement in carrying out my responsibilities with due care and diligence while also acting in accordance with the University’s and BCS requirements.
* I’m not expecting to handle any confidential information. However, as per section 3.d, any confidential information will be handled securely and lawfully in accordance with all legislation and with the permission of the University.
* In accordance with section 3.e, information about the performance of my product will be published in my final report.
* As per section 4.a, 4.b and 4.c, I understand that I hold the responsibility not to bring the field of IT/Computer Science into disrepute through any of my actions. I will instead aim to uphold and improve the practices in my field and the BCS.
* Finally, in accordance with 4.f, I aim to help all other members of the BCS with respect to the field of Computer Science.

Lastly,my project will not need an ethical review as I plan on involving any human participants in my research. However, I do intend to go through and sign an ethical compliance form with my supervisor in the coming weeks to confirm that my project complies with all ethical considerations.

**Related Work**

The structure of a fact checking task can be best summarised by four steps that are laid out by Andreas Vlachos [1]:

1. Extract statements from an article/document to be fact checked.
2. Construct appropriate questions/queries about the statements for the external database to answer.
3. Obtain answers to those queries from the external database.
4. Extension; if constructing an automated fact checking service, reach a verdict using that answer.

**Named Entity Recognition (NER)**

Statement extraction (the first step) is a well-explored area of NLP and is where a lot of my attention will be focused. The first stage of it is detecting named entities in the text, otherwise known as Named Entity Recognition (NER). This process can be best summarised by Andrei Mikheev [2], who says “Named Entity recognition involves processing a text and identifying certain occurrences of words or expressions as belonging to particular categories of Named Entities (NE).”

The difficulties behind NER are twofold, as Daniel Jurafsky [3] explains; “Recognition is difficult partly because of the ambiguity of segmentation; we need to decide what’s an entity and what isn’t, and where the boundaries are. Another difficulty is caused by type ambiguity. The mention JFK can refer to a person, the airport in New York…”. For humans, this is a fairly trivial task because we can use context around the named entities to carry out NER. The difficulty is in designing an algorithm which can do this task without human supervision.

**Automated Fact Checking**

Extensive research has already been carried out in the field of automated fact checking (AFC). I’ve found that even in AFC, however, human supervision is currently still a necessity. Lucas Graves [4] points out that “Both researchers and practitioners agree that the real promise of AFC technologies for now lies in tools to assist fact-checkers to identify and investigate claims, and to deliver their conclusions as effectively as possible.”

This sentiment is echoed by A.T.Nguyen [5], who poses a critical question; “While many automated fact-checking systems have been recently proposed, the human side of the partnership has been largely neglected: how might people understand, interact with, and establish trust with an AI fact-checking system? Does such a system actually help people better assess the factuality of claims?”. It’s apparent that a fully automated system shouldn’t be thought of as the be all and end all, as it poses serious issues when it comes to human interaction.

Naeemul Hassan goes further and lays out four factors that contribute towards the “Holy Grail” of computer-based fact checking systems:

**“Fully automated**: It checks facts without human intervention. It takes as input the video/audio signals and texts of a political discourse and returns factual claims and a truthness rating for each claim (e.g., the Truth-O-Meter by PolitiFact).

**Instant**: It immediately reaches conclusions and returns results after claims are made, without noticeable delays.

**Accurate**: It is equally or more accurate than any human fact-checker.

**Accountable**: It self-documents its data sources and analysis, and makes the process of each fact-check transparent. This process can then be independently veriﬁed, critiqued, improved, and even extended to other situations.”

Clearly, given my time frame, aspects of these characteristics won’t be attainable. It’s therefore clear to me that my primary aim should be to provide a tool that instead assists human fact checkers as quickly, accurately and effectively as possible, instead of focusing on the automated aspect.

**ClaimBuster**

A lot of fact checking software currently available focuses on so called ‘fake news’ in politics. One such piece of software is called ClaimBuster, a tool that can identify claims within a text that are most likely to be false and therefore need checking. It does this by providing the user with a quantitative measure about how check worthy the text is. Hassan [6], the co-founder of ClaimBuster, explains “Given a sentence, ClaimBuster gives it a score between 0.0 and 1.0. The higher the score, the more likely the sentence contains check-worthy factual claims. The lower the score, the more non-factual, subjective and opinionated the sentence is.”

An example of what ClaimBuster does is illustrated below. I’ve created a dummy piece of text, emulating something that may be said by a politician and submitted it to the software to observe the kind of sentences it thinks are check-worthy.

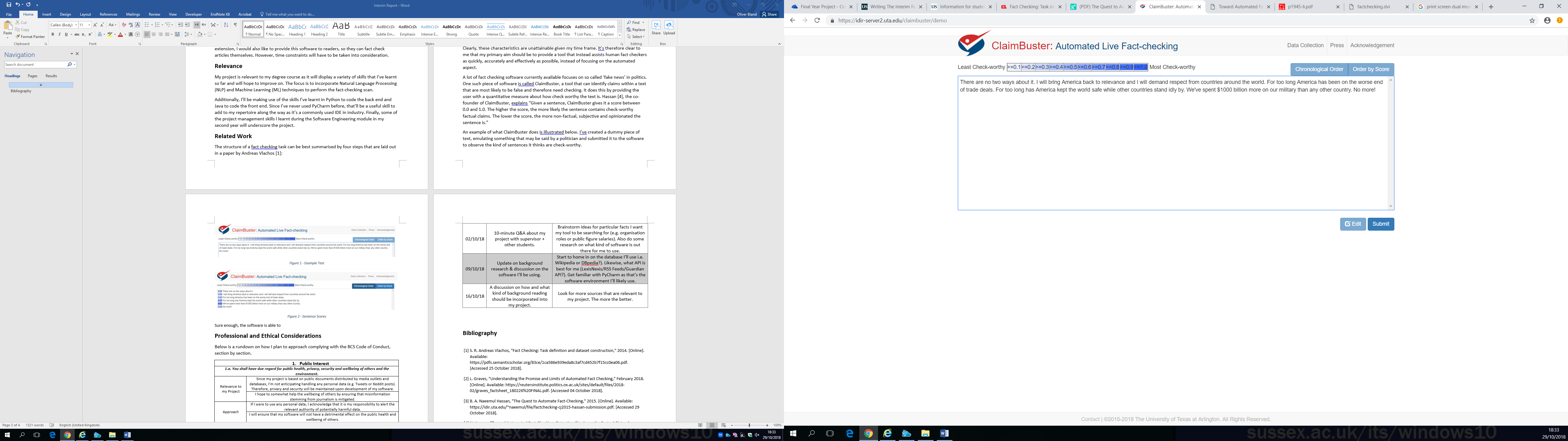


Figure 1 - Example Text

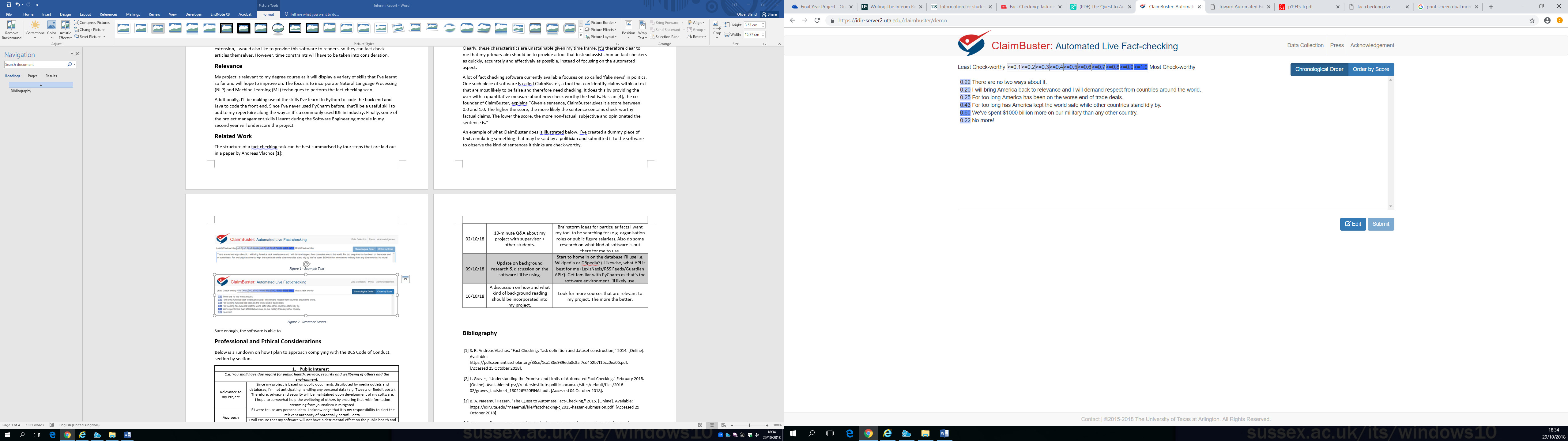


Figure 2 - Sentence Scores

Sure enough, the software assigns a higher score to the sentence that is worth fact checking than any of the other sentences. We can therefore see that at least when it comes to political facts, the software is very helpful in fact checking. However, I hope to provide a product that’s different in the following ways:

1. I’d like to provide a product that specialises in one, different domain – organisational roles. Submitting the sentence “We need only look at the success that Bill Gates has had as CEO of Facebook to see that the field is extremely prosperous” yields a check-worthy score of 0.28 by ClaimBuster. Yet this sentence clearly contains a false fact when it comes to the organisational role of Bill Gates. I want to provide a tool that more effectively allows the journalist/user to avoid misinformation like this.
2. Instead of scoring all sentences and providing that information to the user, I’d like to build a tool which scans a document and only returns sentences which it deems needs fact checking.
3. Upon finding a claim relating to the organisational role of a named entity, I want the user to not only be informed of the current role of that named entity but previous roles also. This will allow the user to view if the entity was ever a member of the organisation in question and if so, when.

**Requirements Analysis**

**Functional Requirements**

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| **ur-1** | **User Requirement 1** |
| The user will have the option to submit their document/article into the software, either via a link or as a transcript of text. | |
| **fr-1-1** | **Functional Requirement 1.1** |
| Type | Mandatory |
| Description | The software **shall** give the user the option to submit their document via a link or file path. |
| **fr-1-2** | **Functional Requirement 1.2** |
| Type | Mandatory |
| Description | Alternatively, the software **shall** give the user the option to submit their document as a pasted transcript. |
| **fr-1-3** | **Functional Requirement 1.3** |
| Type | Desirable |
| Description | The software **should** notify the user of an error when the input text or document isn’t of the correct format. |

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| **ur-2** | **User Requirement 2** |
| Upon submitting the document, the user will be provided with a list of facts from the document where a named entity is said to be part of an organisation. Those facts should be interactable for the user. | |
| **fr-2-1** | **Functional Requirement 2.1** |
| Type | Mandatory |
| Description | The user **shall** be shown a list of facts from the document (pertaining to a named entity’s organisational role). |
| **fr-2-2** | **Functional Requirement 2.2** |
| Type | Mandatory |
| Description | The software **shall** return the results of its fact checking after no more than a 10 second delay (assuming the document is no longer than 3,000 words). |
| **fr-2-3** | **Functional Requirement 2.3** |
| Type | Mandatory |
| Description | The user **shall** be able to interact with each fact, in order to display more information about them. |
| **fr-2-4** | **Functional Requirement 2.4** |
| Type | Desirable |
| Description | Each picked out fact **should** be displayed with a coinciding score that represents how likely the fact is of being correct. |

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| **ur-3** | **User Requirement 3** |
| Interacting with facts will display information about the organisational ties of the named entity in that fact, according to DBpedia. | |
| **fr-3-1** | **Functional Requirement 3.1** |
| Type | Mandatory |
| Description | The named entity’s current organisation, role and start date **shall** be displayed. |
| **fr-3-2** | **Functional Requirement 3.2** |
| Type | Mandatory |
| Description | Previous organisational roles of the named entity **shall** be displayed along with their role and the years they were associated to that organisation for. |
| Detail | *Jack Downing*  *Financial Assistant HSBC 2004-2007*  *Operational Director Barclays 2007-2012*  *CEO Santander 2012-Present* |
| **fr-3-3** | **Functional Requirement 3.3** |
| Type | Mandatory |
| Description | To deal with ambiguity in the case that there are multiple instances of the named entity in the external database, all instances of the named entity **shall** be listed. Specifically, they’ll be listed in descending order based on which instance of the named entity my model thinks the journalist was referring to. |
| Detail | *Jack Downing (Banker)*  *Financial Assistant HSBC 2004-2007*  *Operational Director Barclays 2007-2012*  *CEO Santander 2012-Present*  *Jack Downing (Estate Agent)*  *Secretary Hamptons 2012-2013*  *Estate Agent Savills 2013-2016*  *Operational Director Savills 2016-Present* |
| **fr-3-4** | **Functional Requirement 3.4** |
| Type | Desirable |
| Description | There **should** be an external link for the user to view further information about the named entity. |

**Non-Functional Requirements**

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| **nfr-1** | **Non-Functional Requirement 1** |
| Python will be my programming language of choice for the back end of this project. Specifically, I’ll be using Python 3.6.3 as this is the version I am most familiar with and it has all the features I need.  **Justification:** I’m familiar with Python, having learnt it during my second year of studies with the University. Also, Python provides great tools/libraries for me to use for NLP purposes. In particular, I’ll be making use of the NLTK, SpaCy and Stanford CoreNLP libraries for tasks such as named entity recognition (NER) and part-of-speech(POS) tagging. | |

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| **nfr-2** | **Non-Functional Requirement 2** |
| PyCharm will by my IDE of choice when it comes to programming in Python. I’ll be using the latest version of PyCharm; 2018.2.4.  **Justification:** Previously I’ve used Jupyter Notebooks for programming in Python and I’m currently unfamiliar with PyCharm. However, under my technical supervisor’s advice, I’m going to use this project to get to grips with PyCharm; partly because it’s an industry standard IDE. PyCharm is much more convenient when it comes to standalone python scripts, something I intend on making use of throughout. Unlike Jupyter, it also supports Git[[1]](#footnote-1) integration which I’ll be making use of over the course of my project. Lastly, PyCharm offers superior coding assistance to Jupyter Notebooks, particularly when it comes to code navigation and refactoring. | |

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| **nfr-3** | **Non-Functional Requirement 3** |
| Java will be my programming language of choice for the front end. Specifically I’ll be using Java 8, as this is the latest version supported by NetBeans[[2]](#footnote-2).  **Justification:** Programming the front end in Java will allow me to make use of the JavaFX library. My reason for not using a more orthodox front-end programming language such as JavaScript or HTML is that I’m much more familiar with Java and JavaFX provides me with more than enough features to create the simple GUI that I need. | |

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| **nfr-4** | **Non-Functional Requirement 4** |
| NetBeans will be my IDE of choice when I program in Java. The version I aim to use is NetBeans 8.2, although that may vary depending on which computer I’m using.  **Justification:** NetBeans is the official IDE for Java. It’s easy to use, open source and powerful for GUI building. Again, I’m familiar with it having used it extensively for the past year and it also supports Git version control.[[3]](#footnote-3) | |

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| **nfr-5** | **Non-Functional Requirement 5** |
| When it comes to version control, I’ll be using Git and GitHub to manage all files related to this project.  **Justification:** The reason for using any form of version control is the ease it provides oneself for working on a set of files and code. The reason for using Git and GitHub in particular is that they’re industry standard and centralised. I’d also like to build a portfolio of my projects in GitHub which I can show to prospective employers in the future. | |

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| **nfr-6** | **Non-Functional Requirement 6** |
| The software will run on all modern Windows desktop machines at minimum. Further, I aim to make the software runnable on modern macOS machines if possible.  **Justification:** Given that I’ll primarily becreating this software on Windows machines, it goes without saying that I’ll be able to make it runnable on Windows. It may not be possible to make the software compatible for macOS machines as well though, given the time constraints. | |

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| **nfr-7** | **Non-Functional Requirement 7** |
| I aim to deliver a reliable tool, free of major bugs that cause the application to crash or exit without prompt. Additionally, I’m aiming for a 90% precision rate; in other words, 90% of the facts my tool picks up should be true positives. I’m also aiming for a 80% recall rate; in other words, my software should pick up 80% of the total relevant facts in the document.  **Justification:** Although I’d like a0% error rate, that won’t be possible given the time constraints. The precision and recall rates stated above are much more realistic. The reason that I’m aiming for a higher precision rate than recall rate is that I anticipate false negatives to be much more troublesome to eliminate than false positives. | |

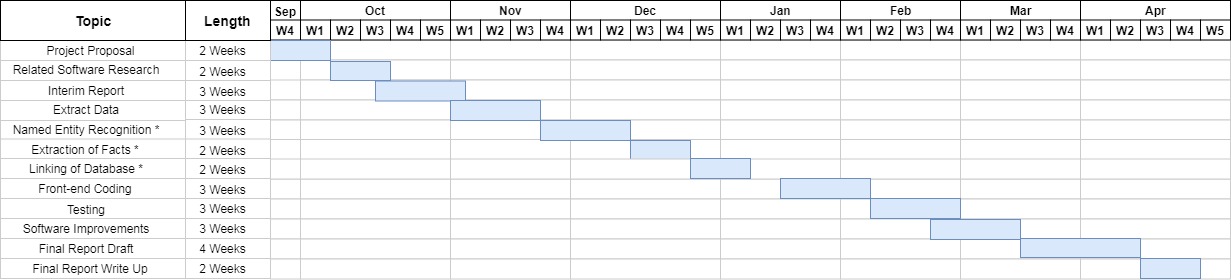
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| **nfr-8** | **Non-Functional Requirement 8** |
| The Guardian is my API of choice for providing the news articles that my model will be based on.  **Justification:** Having researched a multitude of APIs that I could use to provide me with my data, I’ve chosen the Guardian API because it’s the deepest and most robust when it comes to content analysis. It offers more than 1.7 million pieces of content - more than enough for me to build my model on. | |

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| **nfr-9** | **Non-Functional Requirement 9** |
| I’ve chosen to use the DBpedia API as my external database that facts will be checked against.  **Justification:** Ultimately, I chose to use the DBpedia API over the WikiPedia API because it provides data in a more structured format. As a result, I’ll be able to process and possibly even provide data much more conveniently. | |

**Project Plan**

**Gantt Chart**

Below is a Gantt chart I’ve produced to give a broad idea of the timescale I intend on devoting to each task during the project. Of course, it is subject to change depending on what transpires over the course of the project. Note that the weeks represent each Monday in the given month. For example, October 2018 contains 5 Mondays, so for the purpose of my project there are 5 weeks in October. The tasks already completed are the project proposal, related software research and interim report - I’m yet to start any other task.



NB – Back-end coding was split into the three topics marked with an \*.

**Weekly Timetable**

The timetable below represents how much time I plan on devoting to my project per week. The timetable isn’t set in stone (for example, my supervisor meeting is subject to change from week to week), however I do plan on spending a minimum of 10 hours a week on self-study. What’s likely to end up happening is that I spend more than the allotted 10 hours per week on my project, where possible & appropriate. Come the Spring term, my timetable will change to allocate more hours for this project.

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|  | Mon | Tue | Wed | Thurs | Fri | Sat |
| 9:00-10:00 |  |  |  |  |  |  |
| 10:00-11:00 |  |  | Self-Study |  |  |  |
| 11:00-12:00 |  |  | Self-Study |  |  | Self-Study |
| 12:00-13:00 |  |  | Self-Study |  | Lecture | Self-Study |
| 13:00-14:00 |  |  |  |  |  |  |
| 14:00-15:00 |  |  |  | Self-Study |  |  |
| 15:00-16:00 |  | Supervisor Meeting |  | Self-Study |  |  |
| 16:00-17:00 | Self-Study |  |  | Self-Study |  |  |
| 17:00-18:00 | Self-Study |  |  |  |  |  |

**Interim Log of Supervisor Meetings**

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| Date | Discussion Topic | Future Actions |
| 26/09/18 | Initial discussion about what my project would entail & first steps. | Background research; particularly research articles in similar areas as the domain I’ll be working in. |
| 02/10/18 | 10-minute Q&A about my project with supervisor + other students. | Brainstorm ideas for particular facts I want my tool to be searching for (e.g. organisation roles or public figure salaries). Also do some research on what kind of software is out there for me to use. |
| 09/10/18 | Update on background research & discussion on the software I’ll be using. | Start to home in on the database I’ll use (i.e. Wikipedia or DBpedia?). Likewise, what API is best for me (LexisNexis/RSS Feeds/Guardian API?). Get familiar with PyCharm as that’s the software environment I’ll likely use. |
| 16/10/18 | A discussion on how and what kind of background reading should be incorporated into my project. | Look for more sources that are relevant to my project. The more the better. |
| 06/11/18 | Feedback on the draft of my interim report & discussion about the project plan. | Take on board some of the advice and make some last adjustments to the report. |

Word Count - 4425

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**Appendix**

**Project Proposal**

**Candidate Number** – 164547

**Supervisor** – Dr Julie Weeds

**Working Title** – Fact-Checking Journalism

**Aims and Objectives**

The purpose of my project is to provide a tool to journalists which can be used to fact check aspects of their article/document against an external database.

Since ‘fake news’ is such a prominent topic currently, I’m motivated to create a tool which can help journalists mitigate false information in their article before being published. As an extension, I’d also like to provide this software to readers, so they can fact check articles themselves. However, time constraints will have to be taken into consideration.

It should be noted that my focus will be on providing a tool which journalists can manually use to check their facts as opposed to creating an automated service. I intend to do this by providing some sort of link to the external database concerning the fact in question. Automated fact-checking is an extension of my project.

Rather than scanning for all facts within a document - which may prove difficult and inaccurate – I’ll focus my tool on fact-checking a specific area of interest about named entities. This means searching for any instances where a person is stated to hold a job within an organisation. My tool would then provide a link to the external database displaying what role that person currently has.

**Relevance**

My project is relevant to my degree course as it will display a variety of skills that I’ve learnt so far and will hope to improve on. The focus is to incorporate Natural Language Processing (NLP) and Machine Learning (ML) techniques to perform the fact-checking scan. Additionally, I’ll be making use of the skills I’ve learnt in Python to code the back end and Java to code the front end. Since I’ve never used PyCharm before, that’ll be a useful skill to add to my repertoire along the way.

**Resources Required**

I’ll require a database to check my named entity facts against. Options that I’m looking at include DBpedia and Wikipedia. As for an API that I’m looking for to provide me with news articles to train and test my model with, options include LexisNexis, the Guardian API and Google’s API.

The software environment I’ll be using to code my backend is PyCharm, while I’ll most likely use the NetBeans IDE to code my front end.

**Weekly Timetable**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Mon | Tue | Wed | Thurs | Fri | Sat |
| 9:00-10:00 |  |  |  |  |  |  |
| 10:00-11:00 |  |  | Self-Study |  |  |  |
| 11:00-12:00 |  |  | Self-Study |  |  | Self-Study |
| 12:00-13:00 |  |  | Self-Study |  | Lecture | Self-Study |
| 13:00-14:00 |  | Lecture |  |  |  |  |
| 14:00-15:00 |  |  |  | Self-Study |  |  |
| 15:00-16:00 |  | Supervisor Meeting |  | Self-Study |  |  |
| 16:00-17:00 | Self-Study |  |  | Self-Study |  |  |
| 17:00-18:00 | Self-Study |  |  |  |  |  |

The above timetable represents how much time I plan on devoting to my project per week. The timetable isn’t set in stone (for example, my supervisor meeting is subject to change from week to week), however I do plan on spending a minimum of 10 hours a week on self-study.

1. See nfr-5 [↑](#footnote-ref-1)
2. See nfr-4 [↑](#footnote-ref-2)
3. See nfr-5 [↑](#footnote-ref-3)