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| X:\SSDC_Share\Study Skills\301 Services\SURE\SURE Scheme 2012\Publicity 2012\SURE_banner_longer.jpg  **2019 Application Form**  **Deadline – 12pm, Tues 12th March 2019**  **Guidance on completing this form is available as a separate download, available here: https://www.sheffield.ac.uk/sure/301** | |
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| **Applicant Details** | |
| Student Name  Sebastian Ksiazczyk | Supervisor Name  Rob Gaizauskas |
| Student Department  Department of Computer Science | Supervisor Department  Department of Computer Science |
| Email address  [sksiazczyk1@sheffield.ac.uk](mailto:sksiazczyk1@sheffield.ac.uk) | Email address  [r.gaizauskas@sheffield.ac.uk](mailto:r.gaizauskas@sheffield.ac.uk) |
| Current year of study:  (please indicate by placing an X in the relevant box)  Year 2 (of a 3 year course) 🞏  Year 2 (of a 4 year course) 🞏  Year 3 (of a 4 year course) X  *NB*: We can’t accept applications if you’re in your first or final year of study | Second Supervisor name and email (optional): |
| **Project Proposal** | |
| Title | |
| Metaphor interpretation based on weighted abduction in Markov Logic Networks | |
| Outline (500 words max) | |
| Metaphor is an inherent characteristic of English language which helps us relate abstract concepts to domains most familiar to us, e.g. spatial orientation. Conceptual metaphor theory represents this device as understanding of a concept through referring to properties of another concept.  Metaphor interpretation is one of the big challenges in Natural Language Processing. Although humans have developed a natural ability to reason metaphorically (in fact, research suggests that we are as efficient in metaphorical communication as we are in literal), it isn’t quite the case for computers. In NLP, metaphorical expressions add the problem of recognizing and interpreting figurative speech onto the already existing problem of interpreting discourse where only literal (basic) meaning of words is considered. As a crucial step towards text interpretation, an efficient method of automatic processing of metaphors would significantly improve e.g. automatic translators, voice assistants and chatbots, thus revolutionising the entire IT industry.  Abduction is inference to the best explanation. For the last 30 years it has been a hot topic in NLP, considered by many a promising scheme for interpretation systems.  The foundation for current advancements in metaphor understanding has been laid by Hobbs in 1992 with his proposal of the concept of weighted abduction. He has shown that discourse interpretation could be seen as a task of proving a logical interpretation of sentences, making assumptions where necessary. At the time it was only a theoretical proposition, but over twenty years later promising algorithmic approaches have been introduced, employing e.g. Markov Logic Networks.  Markov Logic Networks are a framework which merge propositional logic and probability into one representation, thus allowing for efficient reasoning on logically represented data under uncertainty. Recently, Kate and Mooney (2009) proposed an approach which enables abductive reasoning in Markov Logic Networks. Later, Blythe et al. (2011) extended the algorithm to implement some properties of weighted abduction.  Currently, one of the cutting-edge methods for processing metaphors described in Ovchinnikova (2014) uses weighted abduction implemented with an ILP-programming algorithm.  In this project I wish to:   1. conduct research in the field of abductive interpretation of metaphors, exploring in depth the most recent advancements and identifying challenges; 2. re-implement the algorithm described in Ovchinnikova (2014), however using a different abduction engine, namely the one proposed in Blythe et al. (2011). Implementation of algorithm developed by Kate and Mooney (the basis of this abduction engine) is the topic of my dissertation project and I wish to re-use that implementation in this research project; 3. compare my results with those achieved with ILP-programming method and arrive at conclusions regarding efficiency.   If the project is successful, the outcome could be a publication about the discoveries, and potentially a prototype of a metaphor interpretation system. | |
| Start date (please indicate by placing an ‘X’ in the relevant box) | |
| The majority of projects will commence on Mon 10 June 2019. You may request a different start date below, but please be aware that **projects cannot start before Monday 10 June 2019.**  Monday 10 June 2019 X  Other 🞏 (please state date and reason): | |
| End Date (please indicate by placing an ‘X’ in the relevant box) | |
| The majority of projects will finish after a 6-week period on Fri 19 July 2019. You may request a different end date, but please be aware that **projects must be completed by Friday 9 August 2019.**  Friday 19 July 2019 X  Other 🞏 (please state date and reason) | |
| Milestones and targets (you may wish to organise these into weekly aims) | |
| **EO Week 1: Research material has been identified and organised.**  **EO Week 2: All researched material has been analysed and reviewed.**  **EO Week 3: System has been implemented.**  **EO Week 4: System has been tested, results compared.**  **EO Week 5: Draft version of paper finished and delivered to Supervisor. EO Week 6: Final version of the paper has been finished.** | |
| **Supporting Information - Student**  **(please refer to guidance notes before completing)** | |
| 1. *Student’s statement of interest in the project and their suitability* | |
| As I was reviewing literature for my dissertation project, I stumbled upon several captivating papers about discourse interpretation theories and tools. I immediately knew that I wished to continue working in the area when my dissertation was finished.  I am now convinced that I have substantial foundational knowledge in the area coming from both literature reviewed in my third academic year and some extra-curricular material I have read (books describing linguistic theories), and owing to these I am suitable to commence a project about the topic I have chosen.  Because my dissertation project was research-oriented, I can say I have experience in delivering such projects, which includes the ability to efficiently utilize library materials, think critically about newly acquired knowledge and reporting advancements to my Supervisor on a regular basis.  Under the eye of my Supervisor with whom I have successfully worked throughout my 3rd year of study, I am positive I can produce something of great quality and potential use in academia and industry. | |
| 1. *Student’s statement on anticipated future impact of taking part in SURE* | |
| The work I have undertaken in the process of writing my dissertation paper has been by far the most fascinating journey on the path of my academic growth.  I was already fascinated with Natural Language Processing where I arrived in Sheffield to begin studying Artificial Intelligence, and ever since the passion has only been strengthening thanks to interesting assignments and lectures provided in my course.  The opportunity of conducting my own research and potentially publishing a paper would make a significant difference not only to my academic growth, but potentially my career choices. It is at the moment the greatest chance for me to see what work in research consists of. | |
| **Supporting Information - Supervisor**  **(please refer to guidance notes before completing)** | |
| 1. *Supervisor’s statement regarding relevance of the research* | |
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| 1. *Supervisor’s statement regarding student’s aptitude, ability and interest in project* | |
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| 1. *Clear indication of Supervisor arrangements* | |
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| **Dissemination Plan** | |
| Please state how the outcomes of your project will be disseminated at the SURE Showcase event, as well as in/or beyond your department and the University of Sheffield. | |
| For the SURE Showcase a poster with graphics explaining the method used for metaphor interpretation could be prepared, as well as depictions of the results achieved with the method (with transparent test cases).  Because the planned outcome of the project includes a published paper, that publication will help disseminate the conducted research beyond the University of Sheffield. | |
| **Bursary Requirements** | |
| Please state the total amount of bursary funding required for your project. | |
| £1080 X  Other 🞏 (please state amount and reason) | |
| Are there any additional costs associated with your project? If so, please provide an itemised list of expenses up to a maximum of £150 (£500 for lab-based projects). | |
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| **Ethics** | |
| I am aware that, should my project require ethics approval, my departmental procedures should be followed, and the SURE team cannot obtain ethical approval on my behalf. (please indicate by placing an ‘X’ in the relevant box) | |
| Yes X | |
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**Completed forms should be uploaded via the SURE 2019 Google application form, available here: https://www.sheffield.ac.uk/sure/301**

**Due to the anticipated large number of applications, late submissions will not be considered.**