

Modelling Perspectives in Philosophy:

A Computational Experiment on Quine's *Word & Object*

Applicants

| Supervisor Name | Department/Group | Faculty |
|--|---|--------------------------------|
| 1. Arianna Betti (philosophy) | Philosophy/ILLC | Geesteswetensc happen (UvA) |
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Project description

In *Modelling Perspectives* a MA student in philosophy and a MA student in computational linguistics take the first steps toward developing a sound method to extract and interpret information about *perspectives* as expressed in philosophical texts in a computational way. We investigate appropriate calibration of an already existing model combining sentiment/opinion mining and event factuality (Van Son et al. 2014) for application to philosophical texts. We focus on an English corpus including one of the most influential philosophical books of the 20th century, *Word & Object* (1960) by W. V. O. Quine.

Philosophical texts aim mainly at exposing *perspectives*, i.e. evaluating the correctness of certain statements or the fitness of certain concepts. The knowledge we possess today on important concepts such as *capitalism*, *tolerance* or *meaning* is based on such perspectives. Perspectives include *judging* a statement's truthfulness or a concept's fitness, or expressing positive or negative *sentiments* about it. Both of these aspects of perspectives are valuable information when trying to interpret information from philosophical texts.

In this exploratory project we want to combine two areas of philosophy and computational linguistics in a novel synthesis, and obtain tools to explore philosophical texts computationally that can valuably complement and enrich traditional methods. To our knowledge, neither NLP-based factuality nor sentiment analysis has ever been applied to philosophical texts. The project will be carried out across two Universities (UvA/VU), and will run parallel to BA- and MA-level philosophy courses during which students are taught to apply traditional methods to the same corpus. We aim at producing at least a common paper or one MA thesis by one of the students, a(n annotated) corpus and scripts/tool prototype apt for philosophical exploration, and have the MA students present their results periodically to the two other groups of students working traditionally. [296/300]

Project Organization

The role of the **Philosophy** MA student is to provide domain expertise in philosophy necessary (a) for the assessment of the application of already existing NLP techniques

and models *as they are* to philosophical texts; (b) for the calibration and adaptation of these models and techniques to philosophical texts in a constant interdisciplinary interplay with a fellow MA student in computational linguistics. Given the fact that the project is the first in its kind, we presume that the student will need to produce annotations for the tasks at (a) and (b).

For these tasks, skills and expertise required are: a completed BA in philosophy, basic knowledge of Quine's philosophical ideas and most important texts (ideally, knowledge in-depth of *Word & Object*), a problem-solving attitude, readiness to work in a team and enthusiasm for engaging in issues going beyond usual challenges in the field.

The role of the **Computational Linguistics** MA student is to provide domain expertise in NLP necessary to apply techniques and models *as they are* to philosophical texts, and creatively calibrate them for application to philosophical texts in a constant interdisciplinary interplay with a fellow MA student in philosophy. He/she will use the current system developed for the NewsReader project that generates RDF representations from text according to the perspective model developed for news. In this model, a formal relation is defined between a source and the statements made by that source. Currently, this relation is filled in with basic properties covering polarity (confirmed or denied), certainty, probability, present/past or future and emotion. The student will adapt the perspective relation to the case of philosophical text and analyse the representation of statements.

For these tasks, skills and expertise required are: a completed BA in computational linguistics/NLP or computer engineering with experience with text mining. [296/300]

Collaboration

Within **philosophy**, *perspectives* are usually reconstructed using a combination of close reading and conceptual analysis of textual sources. This is a strongly qualitative method consisting in having highly skilled humans read extremely carefully a few texts usually about one concept from the same period and author, during several years.

In **computational linguistics** *sentiment analysis/opinion mining* and *event factuality* is a quantitative area of research within natural language processing focusing on the identification of opinions, emotions and sentiments in textual sources.

Models & techniques for sentiment analysis/opinion mining and factuality have been applied to a variety of domains, from the most fact-oriented, technical ones such as the biomedical domain, to the most generic and opinion-oriented domains such as news and twitter corpora. To our knowledge, however, such methods have never been applied to philosophical corpora. Given the conceptual richness and complexity of philosophical texts, and their specific status, this application is innovative and challenging. Our Quine corpus distinguished itself in particular for a rhetorical writing style unusual for an analytic philosopher, including e.g. a highly complex grammar, and a remarkably rich lexicon.

Modelling Perspectives will offer fresh data and a brand-new challenging use-case to computational linguistics; it will represent the beginning of a whole new method of research for philosophy.

The most exciting aspect of *Modelling Perspectives* is the encounter between radically different methods, and its knowledge transfer potential. Two young researchers will be trained in the new field of philosophy computing, and a fruitful interplay will be created between the PI's groups. The MA students will meet every week; the whole team at least once a month. The project will be embedded in existing teaching, especially in two Quine philosophy courses that will run parallel to the project, and during which students apply traditional methods to the same corpus. [299/300]

Deliverables

We aim at producing at least a common paper or one MA thesis by one of the students, a(n annotated) corpus of 1950-1960 writings by Quine and his contemporaries on topics in philosophy of language and logic, and NLP-scripts/tool prototypes apt for computational exploration of perspectives in philosophical texts.

We will have the MA students present their results periodically to two other groups of students working traditionally, and to a group of BA Honours students working on the same corpus with alternative computational techniques (shallow, non-semantical text-mining and metadata visualization). [91/200]

Planning

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| M 1-2: | both students read the basic literature, and familiarize themselves with the problem, the suggested solutions, the software and data structures. |
| M 3-6: | Phil: collect digital publications of Quine, evaluate results application tools <i>as is</i> CL: apply existing perspective analysis NLP methods (Van Son et al 2014) to corpus <i>as is</i> , evaluate results |
| M 7-8: | Phil. annotate corpus, evaluate calibrated tools CL. calibrate tools, re-apply tools |
| M 9-10: | both students: - analyse results from analysis, and improve methods. - produce final report. |

[74/150]