

# Summer School on Argumentation: Report

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## 1 Attendees

The school (henceforth referred to as SSA) attracted **25** participants, 8 from SICSA institutions and 17 from non-SICSA institutions. The breakdown of SICSA participants as well as their rate (residential vs. non-residential) is shown in table 1.

Name	Institution	Residential?
J�r�mie Clos	Robert Gordon University	Yes
Anthony Etuk	University of Aberdeen	Yes
Muhammad Hijaze	Heriot-Watt University	Yes
Mathilde Janier	University of Dundee	No
John Lawrence	University of Dundee	No
Clare Llewellyn	University of Edinburgh	Yes
Saliha Minhas	University of Stirling	Yes
Luisa Pinto	University of Glasgow	Yes

Table 1: SICSA participants at SSA 2014

In total, the SICSA contribution for 6 residential (£500 each) and 2 non-residential (£250 each) participants is £3,500.

## 2 Topic matter covered

SSA covered a wide range of topics related to computational and linguistic perspectives on argumentation. Eleven tutorials were delivered in all by a mix of invited speakers and SICSA-based academics. A student session

was also incorporated into the programme, where students were invited to submit a short (700 word) position statement to then be presented at SSA. The Journal of Argument and Computation<sup>1</sup>, the main journal in the field, provided a £100 prize for the best position statement and presentation.

The tutors at SSA were:

- Dr. Katarzyna Budzynska, Polish Academy of Sciences, **Poland** & University of Dundee, **UK**
- Prof. Diane Litman, University of Pittsburgh, **USA**
- Prof. Marie-Francine Moens, Katholieke Universiteit, Leuven, **Belgium**
- Dr. Nir Oren, University of Aberdeen, **UK**
- Dr. Alison Pease, University of Dundee, **UK**
- Prof. Henry Prakken, University of Groningen & University of Utrecht, **The Netherlands**
- Prof. Chris Reed, University of Dundee, **UK**
- Prof. Andrea Rocci, Università della Svizzera Italiana, Lugano, **Switzerland**
- Prof. Patrick Saint-Dizier, IRIT, Toulouse, **France**
- Prof. Guillermo R. Simari, Universidad Nacional del Sur, Buenos Aires, **Argentina**
- Dr. Adam Wyner, University of Aberdeen, **UK**

Topics included a general overview of computational argumentation, theory and practice for analysing arguments and dialogue, argumentation mining and argumentation in educational contexts. The student session was divided into four categories that reflected the broad range of backgrounds SSA appealed to: *theoretical aspects*; *argument mining & recognition*; *applications & real-life practice*; and *discourse analysis*.

A full copy of the programme is provided in Appendix A.

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<sup>1</sup><http://www.tandfonline.com/toc/tarc20/current>

### 3 Project outcomes and impact

The primary aim of SSA was to provide attendees with a solid foundation in computational and linguistic perspectives on argumentation; feedback received so far indicates that this was achieved through the richness and variety of the programme. Participants also benefited from the student session which provided the opportunity to practice their academic skills and created a new network of collaboration.

The school served a secondary purpose of forging new or strengthening existing collaborative ties with the invited speakers. It also established Scotland as a regional centre of excellence in Argumentation research.

Furthermore, the success of SSA was acknowledged by the steering committee of the Computational Models of Argument (COMMA) conference. Future calls for bids to host the conference will encourage the hosting of a summer school, with preference given to bids that incorporate one into their plans.

### 4 Financial report

	Income	Expenditure
SICSA funding	3,500	-
Fees from Non-SICSA students	6,450	-
University of Dundee - facilities etc.	2,000	-
University of Dundee - cash	1,500	-
Dinner tickets (students)	525	-
Facilities etc.	-	2,000
Lunches	-	1,500
Tutor travel	-	2,181
Tutor accommodation	-	1,343
Tutor subsistence	-	334
Student accommodation	-	4,160
Welcome reception	-	768
Dinner	-	1,691
Bus to COMMA conference	-	200
Total	13,975	14,177
Profit/loss	(202)	

Table 2: Financial summary

SSA made a small loss of £202, which was covered by the University of Dundee over and above matching the SICSA funding. The loss can be attributed to fluctuations in the cost of flights for invited tutors. An overview of the income and expenditure is provided in table 2.

The facilities contribution from the university included: estates costs; printing and photocopying; stationary; and name badges.

The Journal of Argument and Computation funded a prize of £100 for the best student position statement and one tutor was funded from Budzynska's research grant awarded by the Swiss Scientific Exchange Programme NMS-CH (Sciex-NMSch).

# Appendix A

## Main Programme

September 4 – 8, 2014

### Day 1 - Thursday 4 September

- 09.30 – 12.30 Henry Prakken - *Introduction to Formal Models of Argumentation*
- 12.30 – 14.00 Lunch
- 14.00 – 17.00 Student session

### Day 2 - Friday 5 September

- 09.30 – 11.00 Katarzyna Budzynska - *Inference Anchoring Theory: Foundations*
- 11.00 – 12.30 Nir Oren - *Uncertainty in argumentation*
- 12.30 – 14.00 Lunch
- 14.00 – 17.00 Marie-Francine Moens - *Argumentation mining: methods, challenges and possible solutions*

### Day 3 - Saturday 6 September

- 09.30 – 12.30 Guillermo R. Simari - *Different Approaches to Support in Argumentation Systems*
- 12.30 – 14.00 Lunch
- 14.00 – 17.00 Patrick Saint-Dizier - *Argument Analysis in Dislog*

### Day 4 - Sunday 7 September

- 09.30 – 12.30 Andrea Rocci - *An introduction to the Argumentum Model of Topics*
- 12.30 – 14.00 Lunch
- 14.00 – 15.30 Adam Wyner - *Argument Extraction from Social Media Using the General Architecture for Text Engineering (GATE) Tool*
- 15.30 – 17.00 Chris Reed - *Inference Anchoring Theory: Linguistic & Technological Applications*

### Day 5 - Monday 8 September

- 09.30 – 12.30 Diane Litman - *Argumentation Mining for Educational Applications using Discourse and Diagrams*
- 12.30 – 14.00 Lunch
- 14.00 – 15.30 Alison Pease - *Argumentation and mathematical proof*
- 15.30 – 15.45 Closing remarks

## Day 1 - Thursday 4 September

09.30 – 12.30

Henry Prakken

*Introduction to Formal Models of Argumentation*

This tutorial gives an introduction to formal models of argumentation as developed in Artificial Intelligence. First Dung's famous theory of abstract argumentation frameworks is introduced. In this theory the acceptability status of arguments is defined in terms of their conflict relations while fully abstracting from their origin and content. Then an overview is given of frameworks for argumentation-based inference, in which the structure of arguments and the nature of their conflict relations is defined and in which arguments are assumed to be constructed from a given knowledge base. Finally, dialogue systems for argumentation are reviewed, which see argumentation as a form of verbal communication between (human or artificial) agents. Both protocols for argumentation as dialogue and strategies for argumentative agent behaviour are discussed.

This tutorial presupposes introductory knowledge of standard propositional and first-order logic and elementary knowledge of set theory and the theory of relations and functions.

12.30 – 14.00

Lunch

14.00 – 17.00

Student session

## Day 2 - Friday 5 September

09.30 – 11.00

Katarzyna Budzynska

*Inference Anchoring Theory: Foundations*

Inference Anchoring Theory, IAT, combines an account of dialogue structure with argumentation theory through speech act theory. It provides an account of how dialogical actions, such as responding to a challenge, can 'anchor' structural features such as inference. This tutorial will explore the philosophical, linguistic and computational foundations of Inference Anchoring Theory. By the end of the tutorial, students will be able to apply IAT analytical techniques and understand how IAT can be used in computational domains. There are no prerequisites for the tutorial other than competence in English, and students from computational, linguistic and philosophical backgrounds are equally welcome.

11.00 – 12.30

Nir Oren

*Uncertainty in argumentation*

This tutorial will examine the use of probability in abstract and instantiated argumentation. I will discuss the difficulties involved in reasoning with probability in argument, and describe several existing argument based approaches to reasoning with, and about, uncertainty.

12.30 – 14.00

Lunch

14.00 – 17.00

Marie-Francine Moens

*Argumentation mining: methods, challenges and possible solutions*

Argumentation mining involves automatically identifying argumentative information and its argumentative structure in text, that is, the supporting premises and conclusion of a claim, the argumentation scheme of each argument, and the argument-subargument and argument-counterargument relationships between pairs of arguments. Argumentation mining improves information retrieval and also provides the end user with instructive visualizations and summaries of the arguments. In the talk we focus on the methods to extract argumentative information, which pose interesting research questions with regard to structured machine learning. We illustrate the talk with applications that mine argumentation in legal texts, court decisions, scientific texts, debates and reviews.

## Day 3 - Saturday 6 September

09.30 – 12.30

Guillermo R. Simari

*Different Approaches to Support in Argumentation Systems*

The definition of abstract argumentation frameworks by P.M.Dung twenty years ago produced a wealth of results that have improved our understanding of the high level properties of formal argumentation. Abstract argumentation is based in considering a set whose elements are called arguments and a relation defined over that set modeling the concept of attack between arguments.

Although this simple structure has been extraordinarily fruitful, several extensions have been proposed with the aim of having better knowledge representation tools to model the argumentation process. One of the possible extensions is to introduce the notion of support in the abstract framework.

In this tutorial we will explore different facets of the support relation that have been the focus of research, such as the relations of deductive support, necessary support, evidential support, subargument, backing, and other interesting forms in which support emerges in argumentation. The goal will be to highlight similarities and differences between them, and discuss how they appear in different argumentation formalisms.

12.30 – 14.00

Lunch

14.00 – 17.00

Patrick Saint-Dizier

*Argument Analysis in Dislog*

In this tutorial, we first present the Dislog language (Discourse in Logic) and how it runs on the TextCoop Platform. Concrete and simple examples will be developed.

In a second stage, we develop a method that shows how to go from argument samples in corpus to Dislog rules and lexical data. The structure of argument conclusions and supports and an annotation schema will be developed.

Finally, we show how to bind argument conclusions with their related supports, and how discourse structures may interact with arguments.

This tutorial has a practical aim: developing a small argument parser or argument mining system. The basic knowledge of Prolog that is needed will be summarized at the beginning of the tutorial. Participants may come with their own machines to test the examples.

## Day 4 - Sunday 7 September

09.30 – 12.30

Andrea Rocci

*An introduction to the Argumentum Model of Topics*

Approaches to argument schemes are a fundamental strand of theorizing in contemporary argumentation research. Together with models of dialogue (taken broadly to include pragmatic accounts of human dialogue, informal dialectical models and rhetorical theories of status) and models of argument structure, theories of argument schemes are considered a necessary component to reconstruct natural arguments in a way that makes their soundness evaluable. Dialogue models are important to define issues and standpoints and to provide a general account of the commitment dynamics of the dialogue so that the interactional cooperativeness of the participants can be assessed. They are essential, in particular, to evaluate the quality of non-inferential moves in argumentative discussions. Models of argumentation structure offer a specialized tool to reconstruct the commitments of arguers in what concerns the relations of support between the propositions mobilized in the argument, connecting the conceded or otherwise agreed common ground to the standpoint. Models of argument schemes bring us inside each relation of support to reconstruct how an inference from the premises to the conclusion could be licensed. In the tutorial I will present a particular approach to the reconstruction of inference licenses in arguments called Argumentum Model of Topics (AMT), which was developed in Lugano by my colleagues Eddo Rigotti and Sara Greco Morasso. As suggested by the name, this approach draws extensively from a rich Ancient, Medieval and Renaissance tradition originating in Aristotle's book of the Topics, bringing this tradition back to life in a dialogue with modern views on argument schemes. One key feature of this approach is that it joins seamlessly two Aristotelian accounts of argumentative inferences that had remained hitherto separated: the syllogistic model of the (rhetorical or dialectical) enthymeme and the propositional model based on the maxims of the Topics. Thus, the AMT involves in the formal account of inferential relations both a material component where a culturally shared endoxon is brought to bear on the datum presented in the argument, and a so-called procedural component, where an abstract maxim is applied to the composition of the endoxon and datum to derive the conclusion. The second key feature of the model is represented by the conception of the maxim, that is of the inference licenses characterizing the different argument schemes. Maxims are intensional conditionals which can be seen as semantic postulates constituting the very definition of the basic relations of a (folk) ontology of the world or as theorems thereof. Efficient cause-effect, material cause-product, final cause-means, part-whole, genus-species, etc. Each of these relations, called loci in the Latin Medieval and Renaissance tradition can be seen as a node in a folk ontology of the world, defined by a bundle of semantic axioms, which represent the direct or indirect sources of the maxims employed. AMT connects the inferences drawn in ordinary arguments both with culturally specific generalizations, beliefs and values (endoxa) and with a basic ontology of the natural or social world (maxims), opening possibilities of interaction between argumentation theory and both the social and the cognitive sciences. In the first part of the tutorial the components of the model will be presented in a stepwise fashion and applied to simple examples of argument. In the second part AMT will be compared with other contemporary theories of argument schemes.

12.30 – 14.00

Lunch

Continued...

14.00 – 15.30

Adam Wyner

*Argument Extraction from Social Media Using the General Architecture for Text Engineering (GATE) Tool*

The tutorial provides an introduction to argument extraction using the General Architecture for Text Engineering (GATE) tool, focussing on extraction from sample social media. GATE is a free, open-source application with a substantial development and user community. It provides a cascade of prepackaged, accessible natural language processing tools as well as the means to develop useful modules. The tutorial outlines main issues in argument extraction, shows how the tool is used, demonstrates a sample argument extraction on a small corpus, and makes several suggestions about how students can develop their own projects.

15.30 – 17.00

Chris Reed

*Inference Anchoring Theory: Linguistic & Technological Applications*

Inference Anchoring Theory provides a coherent approach to handling a number of challenging linguistic phenomena and supports a rich range of technological developments. This tutorial will cover issues relating to ethos and persuasion in discourse, and will explore a range of computational applications. By the end of the course, students will be able to apply IAT in demanding linguistic contexts and have familiarity with a range of Argument Web applications. The only prerequisite for this tutorial is the IAT Foundations tutorial.

## Day 5 - Monday 8 September

- 09.30 – 12.30 Diane Litman  
*Argumentation Mining for Educational Applications using Discourse and Diagrams*
- The written and diagrammed arguments of students (and the mappings between them) are educational data that can be automatically mined for purposes of student assessment and instruction. Argument mining thus has the potential to enhance many types of educational technologies including computer-supported peer review, computerized essay grading, and massively open online courses (MOOCs). This tutorial will focus on the use of discourse theories and tools from computational linguistics (e.g. RST parsers, discourse connective taggers) to support educationally-oriented argument mining.
- 12.30 – 14.00 Lunch
- 14.00 – 15.30 Alison Pease  
*Argumentation and mathematical proof*
- We will explore the relationship between argumentation and mathematical proof and in particular consider philosophical and linguistic differences between the processes of constructing and presenting mathematical proof (proof-as-process and proof-as-product). Students will do a hands-on analysis of mathematical and non-mathematical arguments in order to determine what, if anything, is unique in the mathematical case.
- 15.30 – 15.45 Closing remarks