Part 1

Argument, Arguing, Argumentation & Arguers

Argument

- We all have an intuitive understanding of argument

- and we can all recognise argument when we see it

- but it is surprisingly difficult to define

- Challenges. Should definitions of argument
  - be normative or descriptive?
  - allow bad arguments and exclude fallacies?
  - require evaluation?
  - refer to goals of a speaker or effects on a hearer?
  - distinguish it from inference, explanation, entailment or proof?
  - focus on process or product?

- Different definitions of argument take different stances on all of these positions

Argument defined

- For our purposes here, we can develop a more-or-less consensus position that covers most approaches in comp ling & NLP

- An argument
    - is a relationship between propositions
    - is invoked by linguistic action (in either monologue or dialogue)
    - results from an appropriate speaker/writer intention
    - is an instance of one of many different types

- An argument
    - may be subsequently evaluated
    - may be bad or good (in many ways)
    - may (often) leave material implicit
    - may have various types of internal structure (linked; convergent)

(Walton, 2006)

Argument defined & shared

- This position is reflected in the Argument Interchange Format (AIF)

- AIF
  - is available in many programming languages
  - supports interchange with many different tools
  - is used to represent the largest extant datasets of argument
  - supports interaction with other conceptions of argument

(Chesnevar et al., 2006)

Arguing

- Arguing is something people do (rather than something that propositions do)

- Arguing typically involves two or more people (not monologue, but dialogue or polylogue)

- Arguing typically involves two or more points of view (not monolectical, but dialectical)

- Arguing concerns advancing arguments

- The process of arguing is governed by rules

Arguing and attacking

- One consequence of the dialectical nature of arguing is that arguments attack one another

- Attacks can be of two types (Pollock, 1987):
  - Rebutting
  - Undercutting
  - (Some authors also distinguish undermining which is equivalent to premise-rebutting)

- An attack, like an argument
  - is a relationship between propositions
  - is invoked by linguistic action (in either monologue or dialogue)
  - results from an appropriate speaker/writer intention
  - is an instance of one of many different types

Argumentation

- Argumentation is a more technical term that has many definitions in the philosophical literature on argument (van Eemeren, 2014)

- We can conveniently side-step these debates and focus on the the two main uses of 'argumentation' in AI
  - Abstract argumentation
  - Structured argumentation
  - (confusingly, argument mining is also sometimes known as argumentation mining. C'est la vie)

- Abstract argumentation
  - encapsulates arguments as nodes in a network
  - connects them through a relationship of attack
  - defines a 'calculus of opposition' for determining what is acceptable
  - allows a range of different semantics

Argumentation

- Structured argumentation
  - opens up the encapsulation
  - supports a range of formal logics for characterising inference
  - builds a mapping to abstract frameworks

- Structured argumentation is still formal, but one step closer to the linguistic form of argument

- There are several examples, but the best developed is ASPIC+ (Modgil & Prakken, 2014)

- AIF supports mapping to ASPIC+ structured argumentation, allowing (through two steps) application of abstract argumentation semantics to natural language discourse

Arguers

- Arguers are those that articulate arguments and engage in arguing

- The least studied of the quadrumvirate

- Two relevant aspects
  - The activity of arguers tracked in analytics
  - The ethos of arguers

- The analysis of stance and expertise also reflects arguers (more later)

Argument, Arguing, Argumentation & Arguers

- NLP techniques typically focus on one of these four in order to deliver deep results on one of these fronts

- It is also possible to combine them
  - but combining argument (arguers, argumentation) and arguing in a single formal model is hard
  - Inference Anchoring Theory does the job (more or less)

- IAT has similarities with SDRT and (fewer) with RST, but focuses specifically on argumentation

- IAT is relatively new, but has applications in many domains (parliamentary, broadcast, legal, mediation, newspaper and democratic discourse)

References

Chesnevar, C. et al (2006) "Towards an Argument Interchange Format", *Knowledge Engineering Review* 21 (4) pp293-316

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Van Eemeren, F.H. et al. (2014) *The Handbook of Argumentation Theory*, Springer

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