

UvA MoL Coordinated Projects 2021-2022

Argument-checking:  
Computational analysis of natural arguments

Jean Wagemans | Federica Russo

Philosophy of Argument | Philosophy of Science, Technology, and Information

# Why argument-checking?

Quality of information is important. All the more so in *online* contexts.

Engaging in the activity of *argument-checking* means we assess the *quality of information* by analyzing reasoning as expressed in *natural argumentative discourse*.

# Research questions

We are interested in the following themes:

- A. The role of **human annotation** in the process of argument-checking;
- B. The prospects of **automatizing** the process of argument-checking in the form of a glass-box AI;
- C. The **ethical stance and boundaries** of argument-checking.

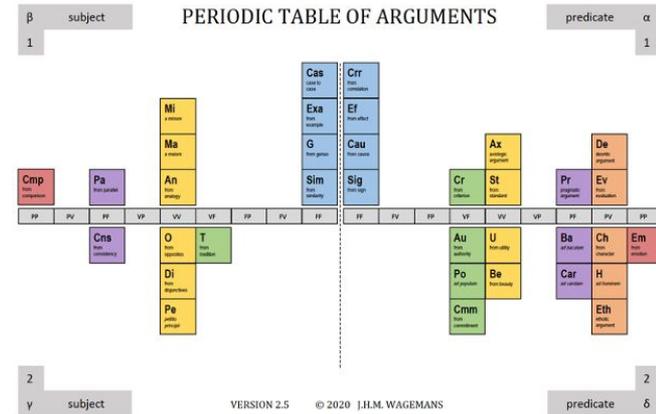
# What is argument-checking?

## Argument-checking

- is an extension of / complementary to fact-checking
- includes an assessment of the premise content AND the connection between the premise and the conclusion of an argument.

## The *step-wise procedure* of argument-checking consists of several components:

- argument **detection**: which discourse elements count as argumentative?
- argument **mapping**: how do the argumentative elements contained in the discourse hang together?
- argument **type identification**: how are individual conclusion-premise pairs represented in the argument map labeled?
- argument **assessment**: determining the acceptability of the argument by asking specific critical questions and working with fallacy theory.



**A. The role of human annotation in the process of argument-checking:**

- How to describe the characteristics of natural argumentative discourse?
- What does the analysis and evaluation of arguments tell us about the quality of information?

# Can the process of argument-checking be automatised?

Computational approaches to argumentation exist, e.g., argument mining, abstract argumentation frameworks, structured argumentation.

*Krino* is our approach is to (partly) automatize the step-wise procedure for argument-checking and to design a human-machine interaction for argument-checking that is able to

- **Parse** the text and annotate its argumentative elements (functional labeling)
- **Analyse** the characteristics of the argumentation and identify the points of attack
- **Assess** the argumentation by asking critical questions and applying fallacy theory

## **B. The prospects of automatizing the process or argument-checking in the form of a glass-box AI:**

- Is argument-checking a human activity, or can it be automatized?  
To what extent?
- How should an AI that is capable of argument-checking be designed and used?

# What ethical issues arise in argument-checking?

- Different *styles of argumentation* come with an embedded ethics
  - Cooperative, adversarial, conflictual
- The role of *motivations* to engage in arguments and debates
  - Improving the ‘epistemic situation’
  - Facilitating democratic/institutional deliberations
  - Convincing or persuading other people to believe or do something
- Arguments as ‘truth-seeking machineries’ or to ‘*build shared knowledge*’
  - The collective dimension of building knowledge
  - Cultivating virtues such as epistemic humility
- The ‘*situatedness*’ aspect of arguments and of argument evaluation
  - Understanding *why* an argument is developed, beyond its ‘technical features’
  - Differentiating between various contexts of argumentation, e.g. politics, law, science, medicine.

### **C. The ethical stance and boundaries of argument-checking:**

- What is the *purpose* of argument-checking? Should we pursue adversarial or cooperative forms of argumentation? How can we contribute to shared knowledge and understanding via argument-checking?
- How can we make an AI for argument-checking fair and unbiased?

# Student projects

Students may work on any of the following topics, or propose others:

- Argument mining & argument mapping: contribute to further **developing protocols and procedures** (possible co-supervision by a software engineer)
- Argument type identification (PTA): contribute to better **specify steps for human annotation or for automatizing argument-checking** (possible co-supervision by computer scientist);
- Argument-checking: **develop critical questions and fallacy identification** in the context of arguments expressed in natural language
- Argument-checking: describe the stepwise **procedure in a way that is suitable for automation** (possible co-supervision by a software engineer);
- Adversarial vs cooperative forms of argumentation: **discuss and problematize various ethical stances** with respect to argumentation and to computational approaches to argumentation.

# Organization

Students are given in advance some material about analyzing natural argument and computational argumentation.

A first session is organized, together with student(s) and teacher(s) to discuss the material and to set up the work of the coming weeks, especially the specific sub-project that each student wants to work on.

Students then work autonomously for 3 weeks, with feedback on-demand sessions.

A final mini conference to present the work to the whole group and the teacher(s).

Different arrangements are possible, just contact us! [[J.H.M.Wagemans@uva.nl](mailto:J.H.M.Wagemans@uva.nl) | [f.russo@uva.nl](mailto:f.russo@uva.nl)]

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# Useful links

Krino finalist in the Amsterdam Science & Innovation Award (AmSIA):

<https://www.amsia.nl/innovation-finalists-2019/krino-an-ai-engine-for-causal-inference-and-argumentation/>

Argument-Checking on the LANCAR website:

[www.lancar.org/research-projects/argument-checking](http://www.lancar.org/research-projects/argument-checking)

IIS course on argument-checking:

<https://iis.uva.nl/en/content/news/2021/12/highlighted-from-fact-checking-to-argument-checking.html>

Krino on GitHub: <https://github.com/sparxsystems/krino>