

Computational Argumentation

Organizational Course Information

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General information

▪ Course

- **Lectures.** Henning Wachsmuth
- **Tutorials.** Maja Stahl (+ Carlotta Quensel in lab)
- **Language.** English (+ Python in lab)



▪ Information

- **Web.** <https://www.ai.uni-hannover.de/de/teaching/courses/ca>
- **Stud.IP.** <https://studip.uni-hannover.de/dispatch.php/course/overview?cid=c5b0ac1f93ec5a76a8ad18099f95490a>

▪ Time and location

- **Lectures.** Tuesday 13:00–14:30, Welfengarten 1, Room A310
- **Tutorials.** Tuesday 14:30–16:00, Welfengarten 1, Room A310

Notice: The lab “Argumentation Technology“ (Wednesday 15:15–18:15) is loosely aligned with this course

▪ Consultation?

- Set up appointment with me via e-mail: h.wachsmuth@ai.uni-hannover.de

Teaching at NLP Group <https://ai.uni-hannover.de/en/studies/courses>

▪ **Courses**

- Introduction to Natural Language Processing (bachelor, summer). NLP fundamentals, from rule-based methods to statistical methods
- Statistical Natural Language Processing (master, winter). Core NLP, from statistical methods to neural methods
- **Computational Argumentation (master, summer)**. State-of-the-art NLP, advanced methods in a specific research context

▪ **Labs and projects**

- **Argumentation Technology (master, summer)**
- Human Language Technology (master, winter)

▪ **Seminars**

- Natural Language Processing (bachelor, winter)
- Natural Language Generation (master, summer)

Topic

▪ **This course**

- Computational analysis and synthesis of natural language arguments
Introductory overview of the topic today
- Builds on basics of natural language processing (NLP) and machine learning
High-level recap given in Lecture Part II (presented as video only)
- Covers a wide spectrum of NLP methods (including but not only LLM-based)

▪ **Recommended courses before**

- [Introduction to Data Science](#). Bachelor, Lindauer
- [Machine Learning](#). Master, Rosenhahn
- [Statistical Natural Language Processing](#). Master, Wachsmuth
- [Text Mining](#). Master, Sikdar (*alternative to Statistical NLP*)

▪ **Goal of this course**

- Understand main concepts and methods of an advanced NLP topic
- Learn to develop computational argumentation methods and applications
- Maybe learn to argue better ;)

Course elements

▪ Teaching in presence

- **Lectures.** Presentation of course content (and organizational info)
- **Tutorials.** Presentation of assignments and solutions, Q&A

Note: While the lecture slides cover all content, detailed explanations are given in person only.

▪ Home assignment sheets (details in tutorial)

- **Amount.** 5 in total, bi-weekly (all pencil-and-paper, programming in lab only)
- **Group work.** You need to submit with 3–4 people
- **Bonus.** (a) Min. 60% of all points: exam grade + 1/3, (b) Min. 85%: + 2/3

Example for (b): grade of 2.7 is changed to 2.0; only grades < 5.0 can be improved

- **Note: Unconsiderate AI use has led to notably higher fail rates recently!**

▪ Exams

- **Oral exam.** 30 minutes, questions on all lecture parts, English
- **Tentative dates.** Multiple days, likely late July or early August + late August
- **Registration.** May 15–31, 2026

Example questions will be provided; more details on the exam later

Tentative lecture schedule

▪ **Basics**

- **April 14** Introduction to computational argumentation
- **Video only!** Basics of natural language processing (recap of fundamentals)
- **April 21 – April 28** Basics of argumentation

▪ **Methods**

- **April 28 – May 12** Argument mining
- **May 12 – May 19** Perspective assessment
- **May 19 – June 9** Argument quality assessment
- **June 9 – June 23** Argument generation

▪ **Applications**

- **June 23 – July 14** Applications of computational argumentation
- **July 14** Conclusion

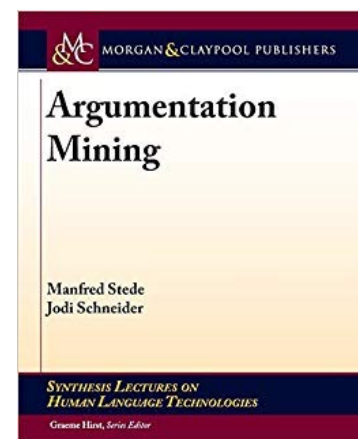
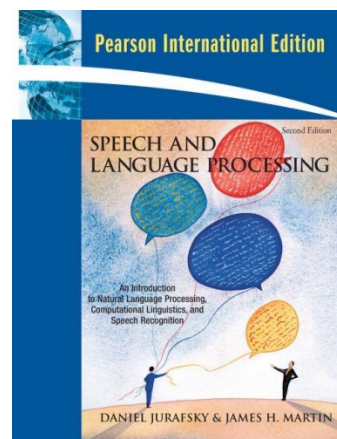
▪ **Notice**

- No lecture on May 26 and July 7

Literature and code basis (not obligatory)

■ Books

- Speech and Language Processing, ed. 3
Free draft online: <https://web.stanford.edu/~jurafsky/slp3/>
- Speech and Language Processing, ed. 2
(Jurafsky and Martin, 2009)
- Argumentation Mining
(Stede and Schneider, 2018)



■ Conference and journal papers

- References to papers will occur in course content
- Most papers can be found online (e.g., at <https://www.aclweb.org/anthology/>)

■ Code (for the lab only)

- Different general NLP libraries available freely
<https://huggingface.co>, github.com/stanfordnlp/stanza/, www.nltk.org, spacy.io, pypi.org/project/polyglot/, ...
- Papers often provide a URL where code can be found
- Still, extensive own implementation needed in programming tasks

References

- **Jurafsky and Martin (2009).** Daniel Jurafsky and James H. Martin (2009). Speech and Language Processing: An Introduction to Natural Language Processing, Speech Recognition, and Computational Linguistics. 2nd edition, Prentice-Hall, 2009.
- **Stede and Schneider (2018).** Manfred Stede and Jodi Schneider. Argumentation Mining. Synthesis Lectures on Human Language Technologies 40, Morgan & Claypool, 2018.