WYDZIAŁ ADMINISTRACJI I NAUK SPOŁECZNYCH
POLITECHNIKA WARSZAWSKA

# Argument Technology

*course syllabus for the academic year 2024/2025*

| | |
|---|---|
| **Basic information** | Meeting times & place:<br>• Spring-summer semester 2024/2025<br>• In-person meetings: to be determined<br>• Online meetings: MS Teams<br><br>Forms of teaching:<br>The course will use a blended approach towards the lecture (in-person/in-class, direct/online).<br><br>Lecturers:<br>dr hab. Katarzyna Budzyńska, dr hab. Marcin Koszowy<br><br>Contact:<br>• E-mail: katarzyna.budzynska@pw.edu.pl, marcin.koszowy@pw.edu.pl<br>• MS Teams |
| **Brief course description** | The course presents major research strands in argument technology – a sub-field of Artificial Intelligence in which computational methods of creating, identifying, analysing, evaluating and visualising arguments and debates are employed. In the last couple of years, the growing interest in argument technologies may be observed, concurrently with the launch of the IBM's Grand Challenge, Project Debater, the AI system that can debate humans in real time on a variety of complex topics. Contemporary advances in argument and debating technologies cover a wide range of research threads including the building of argument corpora and argument analytics for argument mining (the automated extraction of arguments from natural language data) and explainable AI. |
| **The course aims** | The overarching aim of this course is to discuss and assess the current state of the art in the development of argument technology. To this end, a variety of research enterprises constituting theoretical foundations for argument technologies will be emphasised, such as argument mapping software, the corpora of annotated arguments for argument mining, the annotation of argument schemes, the annotation of appeals to speakers' character (ethos), argument and ethos analytics. It will be shown how these and other activities may help building the Argument Web, an online ecosystem of tools, systems and services for argumentation. In this way, a deeper insight into how argument technology is capable of making sense of a large-scale natural language data for understanding and predicting social processes will be obtained. Specifically, the need for understanding the complexity and multi-dimensionality of natural argumentation in dialogical context will be emphasized as a necessary condition for a further development of argument technology being capable of capturing the dynamics of arguments, and helping people build reasonable persuasive arguments, critically assess arguments, and make well-informed collective decisions in such areas as policy making, education, healthcare, intelligence analysis, and risk management. |
| **Assessment criteria** | Contribution to the discussion during the class (30%), argument technology related project devoted either to (1) the creation of a corpus of analysed arguments using OVA+ software, to be put in the access free database of argument corpora AIFdb, or to (2) writing an argumentative essay devoted to the critical assessment and future development of most recent achievements in argument technology (50%), participation in the class (20%). |
| **Course content** | 1. Introduction to argument technology: strands, models, methods, communities. |

| | |
|---|---|
| | 2. From argument mapping to debating technologies: how argument visualisation (e.g. Rationale, Carneades) may help better understand AI systems to debate humans (Project Debater).<br>3. Argumentation theory as a foundation for argument technology.<br>4. Inference Anchoring Theory as a model frame for argument technology.<br>5. OVA+ software as an online tool for representing dialogical arguments.<br>6. Argument structures and argumentation schemes in OVA+.<br>7. Profiles of dialogue and dialogue protocols in OVA+.<br>8. Arvina: a mixed-initiative argumentation platform.<br>9. Analysis and mining of ethos (character of the speaker).<br>10. Corpora for ethos types.<br>11. Ethotic arguments in the debates on contested cultural objects.<br>12. Rephrase structures for argument technology.<br>13. Argument and ethos analytics.<br>14. Argument Web: an online ecosystem of tools, systems and services for argumentation.<br>15. Summary: towards making sense of social behaviour with argument technology. |
| **Tentative source materials and other references** (subject to changes) | <u>Selected bibliography (these and other materials will be available on the MS Teams channel).</u><br><br>[1] Budzynska, K., & Villata, S. (2017). Processing Natural Language Argumentation. In: P. Baroni, D. Gabbay, M. Giacomin, & L. van der Torre, *Handbook of Formal Argumentation*, London: College Publications, 576-625.<br>[2] Lawrence, J., Reed, C. (2019). Argument Mining: A Survey. *Computational Linguistics*, 45 (4): 765-818.<br>[3] Lawrence, J., Snaith, M., Konat, B., Budzynska, K., & Reed, C. (2017). Debating Technology for Dialogical Argument: Sensemaking, Engagement, and Analytics. *ACM Transactions on Internet Technology*, 17(3): 24:1-24:23.<br>[4] Reed, C., Budzynska, K., Duthie, R., Janier, M., Konat, B., Lawrence, J., Pease, A., Snaith, M. (2017). The Argument Web: An online ecosystem of tools, systems and services for argumentation. *Philosophy and Technology*, 30(2): 137-160.<br>[5] Slonim, N. et al. (2021). An Autonomous Debating System. *Nature*, 591: 379–384.<br>[6] Visser, J., Konat, B., Duthie, R., Koszowy, M., Budzynska, K., Reed, C. (2020). Argumentation in the 2016 US presidential elections: annotated corpora of television debates and social media reaction. *Language Resources and Evaluation*, 54: 123–154. |
| **Teaching and learning methods** | 1. Interactive lecturing<br>2. Case study analysis<br>3. Argument mapping and visualisation methods<br>4. Corpora creation methods |