Symbiotic AI: Understanding language-based human signals

Teacher(s)
Lucia Siciliani

Course Website (optional)
N/A

Course description (min 150, max 300 words)
Approaches for intelligent access to information are characterized by the joint use of exogenous semantics, based on structured knowledge sources (e.g., Knowledge Graph, Linked Open Data) and endogenous semantics, based on word embeddings and fostered by Large Language Understanding Models (such as BERT). The combined use of exogenous and endogenous semantics is the key to turning human-understandable language signals (text documents, conversational data, etc.) into machine-understandable semantics, thus creating a semantic layer that can be exploited by systems requiring human-level intelligence. The course will focus on integrating information that comes both from data and semantic models to provide the AI system with the capability of a "deeper understanding" of the information items it deals with.

Course period
December 2023-January 2024

SSD
INF/01

Course References (optional)
N/A

Credits and Hours
3 CFU, 2 of lecture (8 Hours) and 1 of practice (15 hours)

Exam Modality
Two alternatives are available to the student to pass this exam (Teacher(s) may choose other modalities):
1) Paper presentation. Students present the content of 2 papers suggested by the teacher. No groups are allowed.
2) Project. Students implement and experimentally validate an algorithm or its variation from a paper suggested by the teacher. Projects can be done in groups of 1-3 students, depending on the algorithm.

Teacher CV

Teacher Main Publications

1. Amodio, P., Antonucci, L. A., Basile, P., de Gemmis, M., Iavernaro, F., Lops, P., ... & Taurisano, P. (2022). Human Understanding Capabilities of Symbiotic AI systems in FAIR (Future Artificial Intelligence Research).

2. Cassotti, P., Siciliani, L., DeGemmis, M., Semeraro, G., & Basile, P. (2023, July). XL-LEXEME: WiC Pretrained Model for Cross-Lingual LEXical sEMantic changE. In Proceedings of the 61st Annual Meeting of the Association for Computational Linguistics (Volume 2: Short Papers) (pp. 1577-1585).

3. Siciliani, L., Ghizzota, E., Basile, P., & Lops, P. (2023). OIE4PA: open information extraction for the public administration. Journal of Intelligent Information Systems, 1-22.

4. Siciliani, L., Taccardi, V., Basile, P., Di Ciano, M., & Lops, P. (2023). AI-based decision support system for public procurement. Information Systems, 119, 102284.

5. Siciliani, L., Basile, P., Lops, P., & Semeraro, G. (2022). MQALD: Evaluating the impact of modifiers in question answering over knowledge graphs. Semantic Web, 13(2), 215-231.

6. Kopsachilis, V., Siciliani, L., Polignano, M., Kolokoussis, P., Vaitis, M., de Gemmis, M., & Topouzelis, K. (2021). Semantically-Aware Retrieval of Oceanographic Phenomena Annotated on Satellite Images. Information, 12(8), 321.

7. Lucia Siciliani, Pierluigi Cassotti, Pierpaolo Basile, Marco de Gemmis, Pasquale Lops, Giovanni Semeraro: Extracting Relations from Italian Wikipedia using Self-Training. Proceedings of the Eighth Italian Conference on Computational Linguistics, CLiC-it 2021, CEUR Workshop Proceedings 3033, CEUR-WS.org 2021.

8. Lucia Siciliani, Dennis Diefenbach, Pierre Maret, Pierpaolo Basile, Pasquale Lops: Handling Modifiers in Question Answering over Knowledge Graphs. Proceedings of the XVIIIth International Conference of the Italian Association for Artificial Intelligence, Lecture Notes in Computer Science 11946, Springer 2019, ISBN 978-3-030-35165-6210-222

9. Lucia Siciliani, Pierpaolo Basile, Giovanni Semeraro, Matteo Mennitti: An Italian Question Answering System for Structured Data based on Controlled Natural Languages, Proceedings of the Sixth Italian Conference on Computational Linguistics, CEUR Workshop Proceedings 2481, CEUR-WS.org 2019.

10. Lucia Siciliani: Question Answering over Knowledge Bases, The Semantic Web: ESWC 2018 Satellite Events - ESWC 2018 Satellite Events, Revised Selected Papers. Lecture Notes in Computer Science 11155, Springer 2018, ISBN 978-3-319-98191-8, 283-293, 2018.