

Knowledge Graphs are currently one of the most popular approaches to knowledge representation. The idea of capturing relationships among key entities has shown a high practical impact when it comes to building state-of-the-art intelligent systems. In fact, user applications such as semantic search, question answering, and recommender systems and the latest research on explainable AI systems have made them attract a lot of attention in recent times. The focus of this course will be on having a deep overview of what is necessary to design, implement, and work with knowledge graphs. We will learn from classical approaches such as knowledge encoding using RDF, enriching them with OWL, or querying via SPARQL to more advanced techniques for the latent representation of knowledge using embeddings. Finally, we will survey some of the most popular applications of knowledge graphs.

Tentative program

Block 1. Introduction. Why are Knowledge Bases important in modern computer science?

Block 2. A historical perspective. Ontologies, Linked Data, and the Semantic Web

Block 3. Knowledge Graphs. Fundamentals

Block 4. Knowledge Graphs. State-of-the-art

Block 5. Machine Learning and Knowledge Graphs. A new world of opportunities

Block 6. Knowledge Graph Applications (Chatbots, Question Answering, Recommendation Systems)