Question Answering

Systems that automatically answer questions posed by humans in a natural language

Focus

- Based on Knowledge Graphs
- Based on other resources: Set of documents, search engines

Applications

- Question Answering Systems are everywhere, from personal assistants to chatbots and IT ticket management.

- Focus is our thesis focus, no QA focus
- Specifically, we work with
- KG QA
- Extractive QA
- Reading comprehension QA

Objectives
- Develop QA systems sustainable in production environments
- Study methods to detect knowledge gaps in QA systems
- Find strategies to fill these gaps
- Enable QA systems to evolve over time
- Enable QA systems to adapt to new tasks.

- Information evolve over time (dates, dead) there is a need to evolve over time.

Research Questions
- Can we measure QA systems confidence on its knowledge?
- Can QA systems adapt to new tasks?
- How to detect unanswerable questions given the available knowledge?
- How to incorporate new knowledge with previous one?
- How machines and humans performance differ?

- There are plenty of research questions, but we will restrain to those.

Goal: Study the state-of-the-art

- Related to Knowledge Graphs:
  Guillermo Echegoyen, Álvaro Rodrigo, Anselmo Peñas (2019). **Benchmarking Entity Linking for Question Answering over Knowledge Graphs**. Sociedad Española de Procesamiento de Lenguaje Natural (PLN). Volume 63, pages 121-128. ISSN: 19897553, 11355948. DOI: 10.26342/2019-63-13. [2]

Outcomes

- 6 Entity Linking evaluation datasets.
- EL has a higher impact over QA systems than usually though.

- In classic QA systems, one of the first steps is Entity Linking.

[itemize]

Big survey with several collaborators

Question Answering and Lifelong Learning

Programme: Intelligent Systems

└Research Plan

└Research Plan: Second Year

- Several MC collections come from human exams.
- Assess how humans and machines performance differ.

Experimentation is hard

- Money for value
- Interpretability is not always clear
- Catastrophic forgetting is hard to overcome
- We are far from real world QA systems
- Ideal laboratory settings are far from real world use cases

- Deep Learning aims for a number (accuracy).
- Deployed systems face many more problems and inconsistencies than laboratory environments.

- Many libraries
- Lots of algorithms
- AWS, GCP

Trend towards Deep Learning

- Large code base
- Programming GPUs/TPUs
- Experiments are costly
- Cloud computing
- Models are not interpretable
- Research grows exponentially