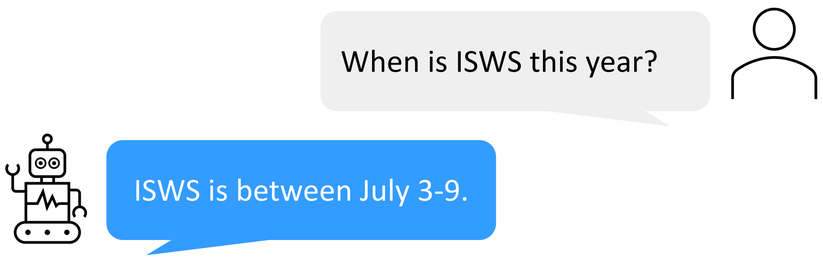
Can we improve commonsense and factual knowledge in **language models** with **knowledge graphs?**

OSKAR HOLMSTRÖM, PhD Student

WE WANT KNOWLEDGEABLE SYSTEMS

- Smart conversational assistants
- Fact-checkers
- Robots that reason about the world

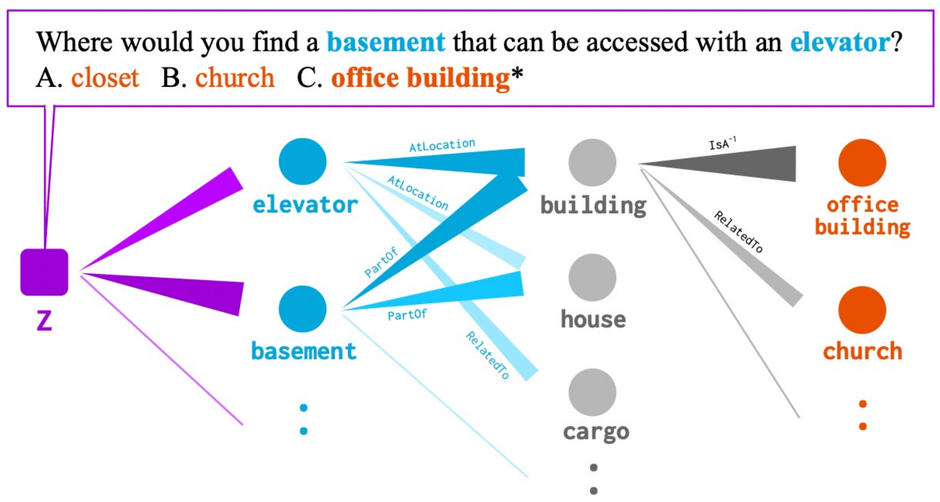


LANGUAGE MODELS ARE DUMB

- Language models know probabilities about text it has trained on. They repeat what they have seen, like stochastic parrots!
- Answer inconsistently
- Difficulty with rare facts
- No commonsense reasoning

WHY JOINT MODELS OF LANGUAGE MODELS AND KNOWLEDGE GRAPHS?

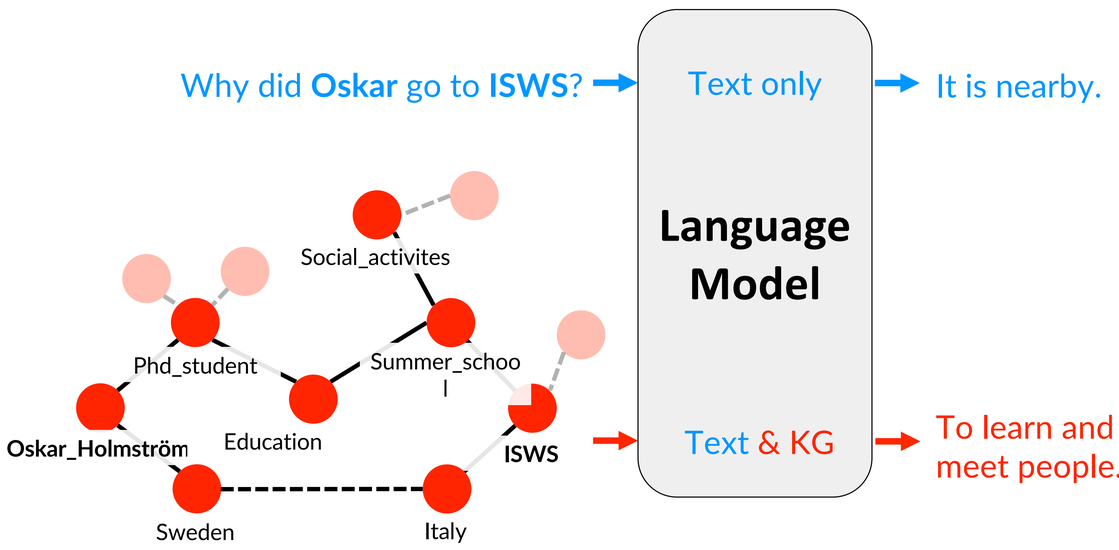
- Knowledge graphs provide knowledge but are often noisy, inconsistent, and have limited coverage
- Language models can fill in where there is a lack of coverage
- Deep learning models provide flexibility and approximate reasoning over graphs



Yasunaga et al., "QA-GNN: Reasoning with Language Models and Knowledge Graphs for Question Answering", 2021.

KNOWLEDGE GRAPHS TO THE RESCUE

- Learn on knowledge graphs and text to improve on knowledge-intensive tasks



WHAT I'M WORKING ON

- How does the model use the knowledge graph?
- Can we improve the integration of text and knowledge graphs in models?
- Can we create better datasets that force the model to use text and knowledge graph?
- Can the same models be used to parse text to improve knowledge graph completion?

LINKÖPING UNIVERSITY

oskar_holmstrom
oskar.holmstrom.liu.se

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