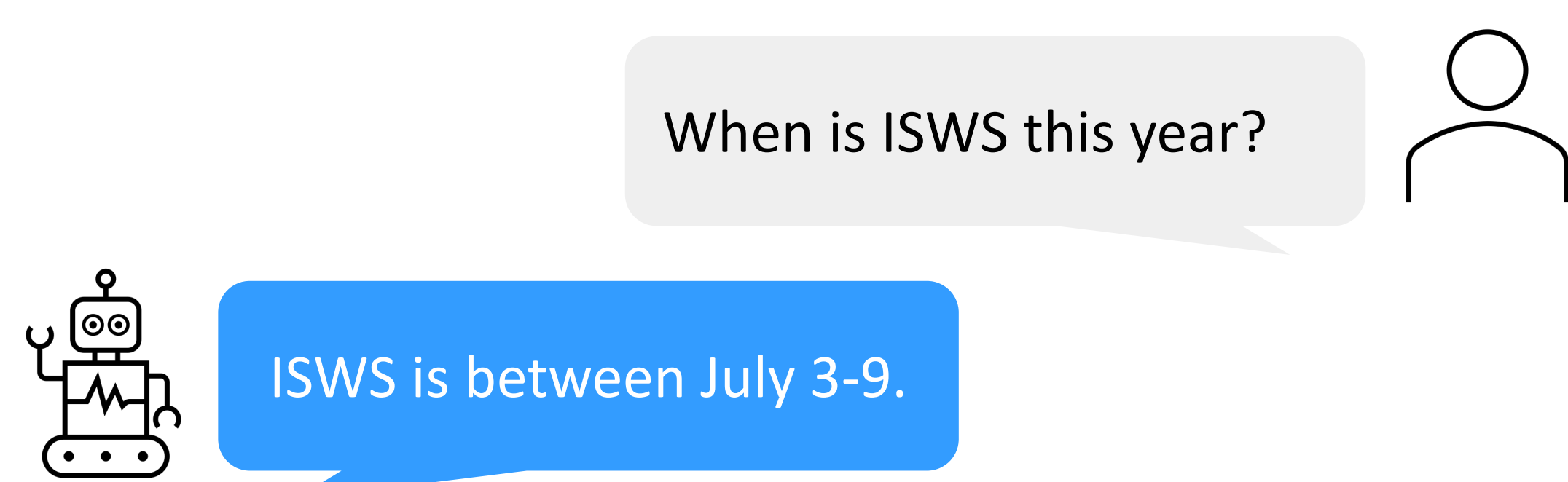


# Can we improve commonsense and factual knowledge in language models with knowledge graphs?

OSKAR HOLMSTRÖM, PhD Student

## WE WANT KNOWLEDGEABLE SYSTEMS

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



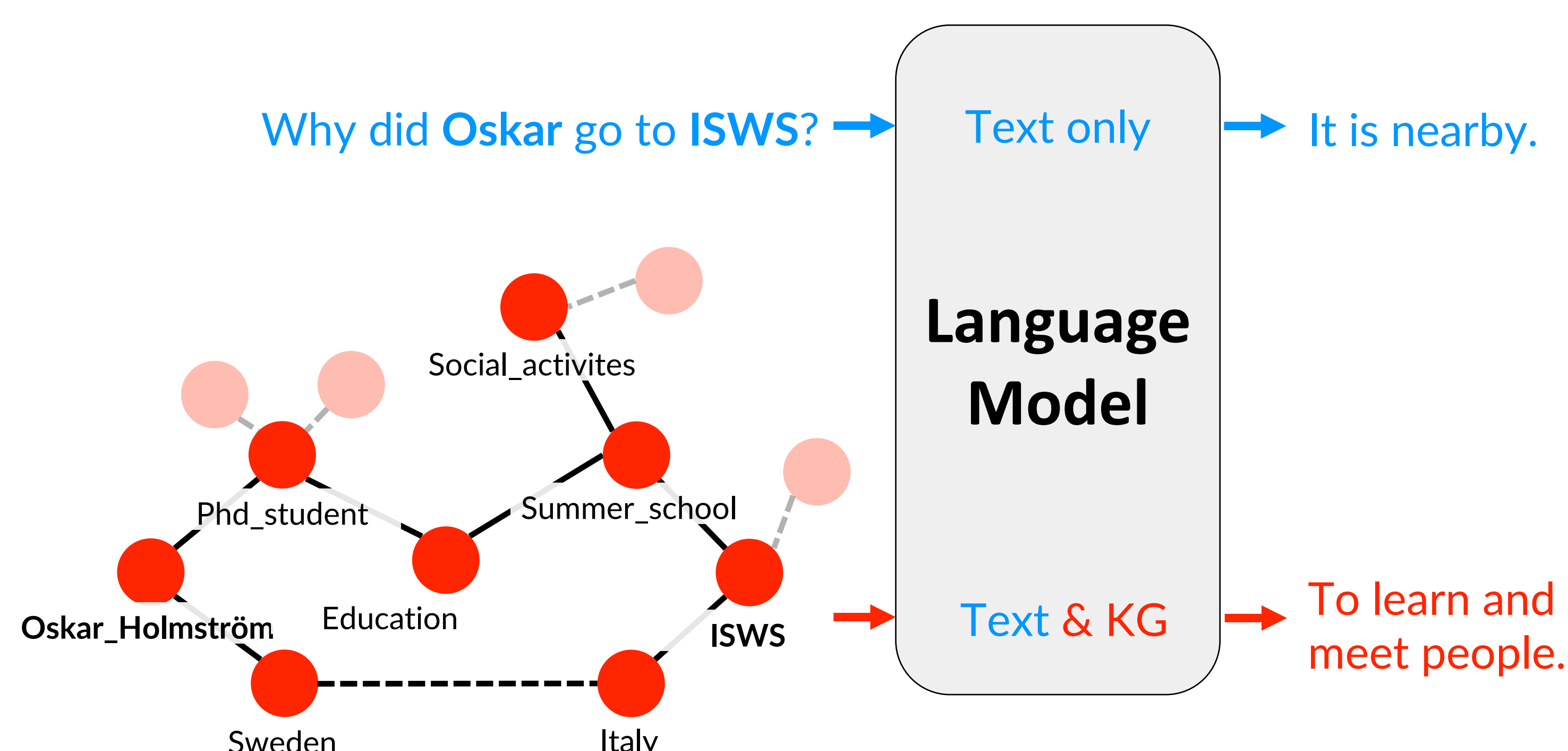
## LANGUAGE MODELS ARE DUMB

- LMs know probabilities about text it has seen – they repeat what they have seen, like stochastic parrots!
- Answer inconsistently
- Difficulty with rare facts
- No commonsense reasoning



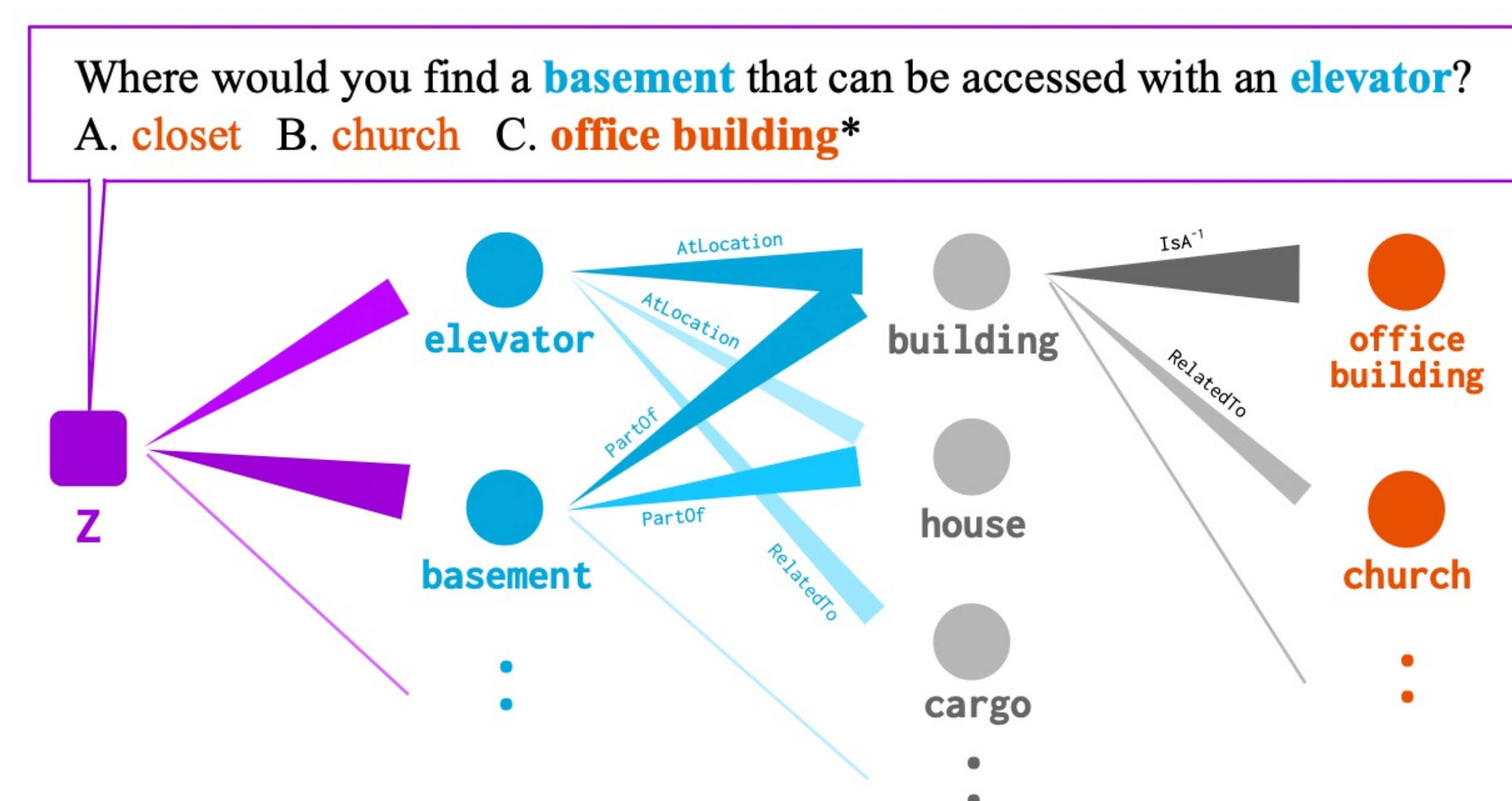
## KNOWLEDGE GRAPHS TO THE RESCUE

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



## WHY JOINT MODELS OF LANGUAGE MODELS AND KNOWLEDGE GRAPHS?

- KGs 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.

## WHAT I'M WORKING ON

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

