

# Efficiency-aware Answering of Compositional Questions using Answer Type Prediction

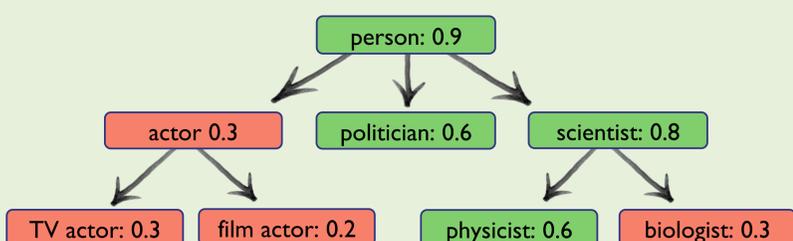
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## Motivation

- Question answering over knowledge bases (KB-QA) has gained attention
- Answer typing** is a key asset in KB-QA
- Helps to improve **efficiency** for complex questions

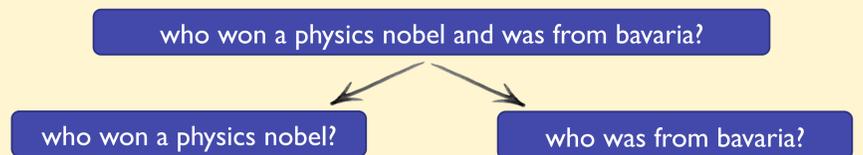
## Answer Type Prediction

- Collect context-aware **candidate types** using **lexical patterns** (*which scientist won the physics nobel?*)
- Expand candidates with dictionaries
- Hierarchical classifier** selects best types from candidates using confidence threshold
  - Surface, syntactic and embedding-based **features**
  - Training data created using **distant supervision**
  - Resources:** KB, type system, question benchmarks

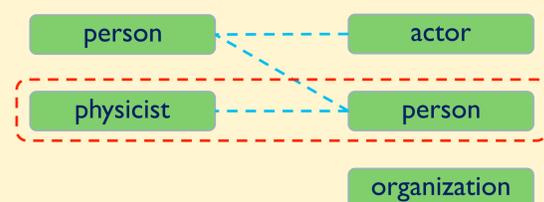


## Compositional Questions

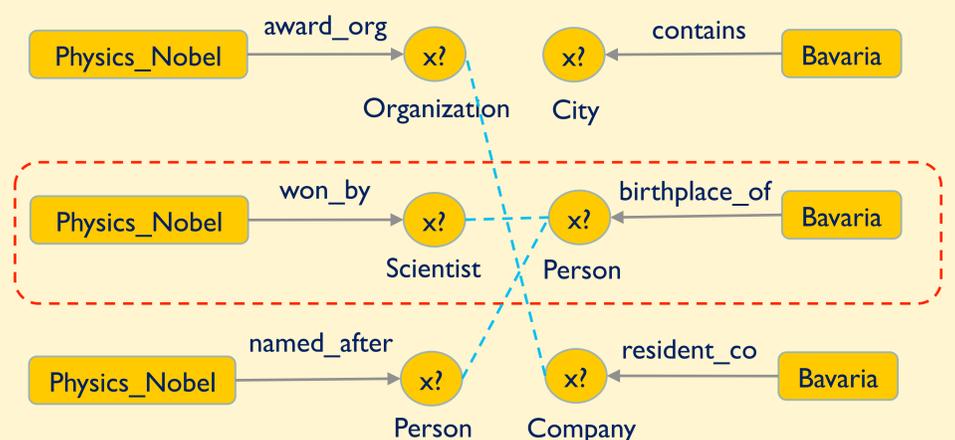
- Decompose** question into simple sub-questions using syntactic patterns on dependency trees



- Predict **answer types** for sub-questions and find fine-grained **compatible types** between sub-questions



- Use this reasoning for **stitching** KB-queries from sub-questions and execute **only stitched queries** over KB!!



## Results

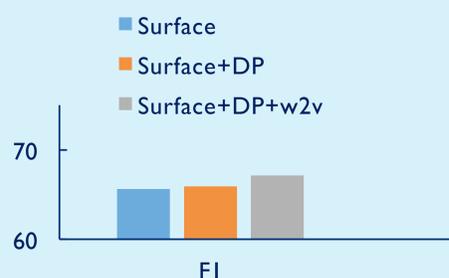
Examples of compositional questions that could only be answered with the answer typing module:

“who played for ac milan and inter milan?”

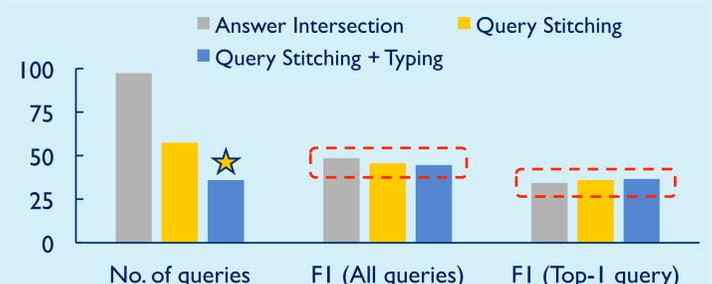
“in which country where the adidas and puma footwear founded?”

“who is the president of the us who played in bedtime for bonzo?”

### Intrinsic evaluation



### Extrinsic evaluation



**Our answer typing module can act as a plug-in to any KB-QA system and can help answer compositional questions much more efficiently**

