

Background

- Knowledge base provides deep knowledge on items and logical connections among other entities.



Captain America: The First Avenger

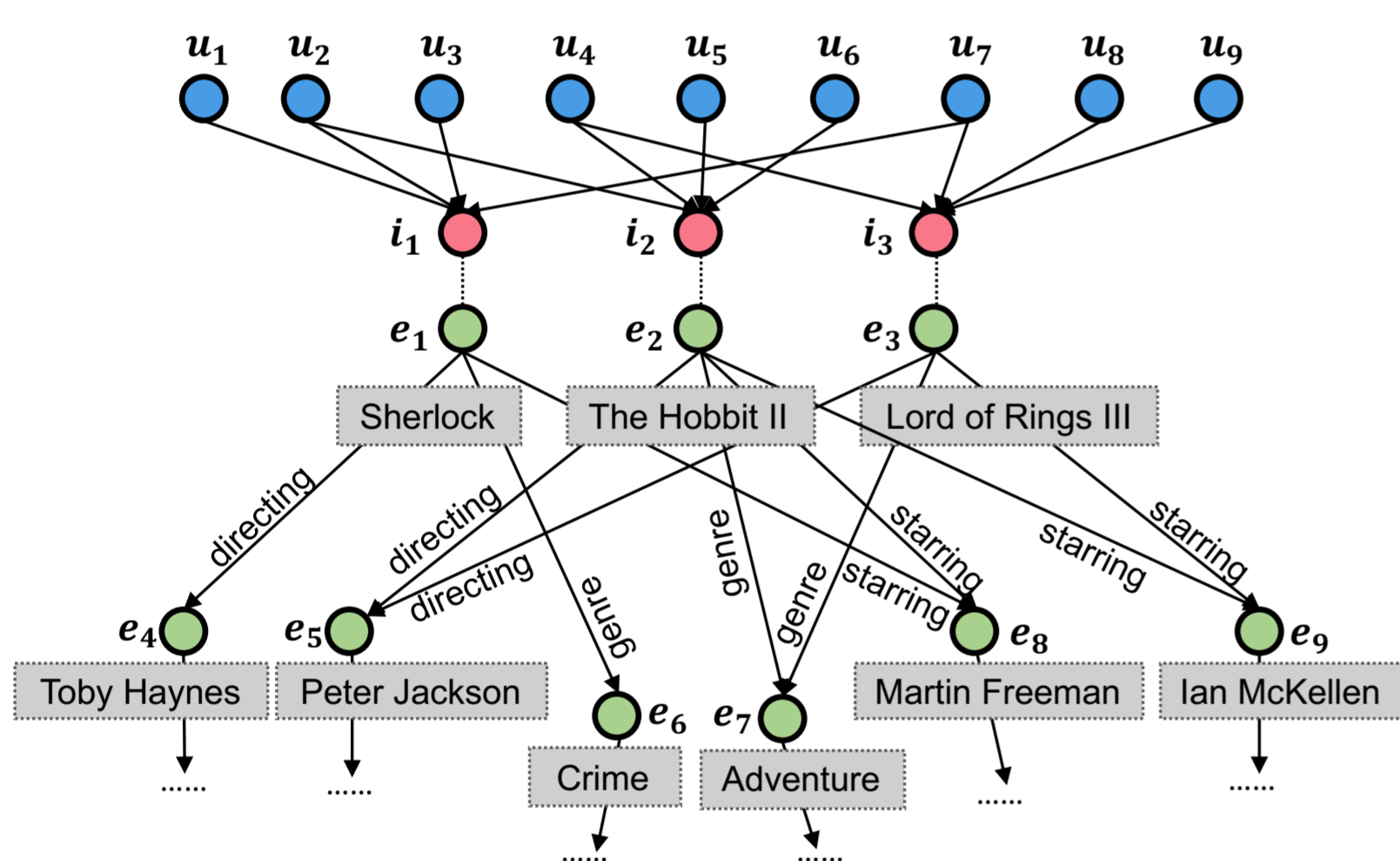
- Director: Joe Johnston
- Writers: Christopher Markus, Stephen McFeely, Joe Simon, ...
- Cast: Chris Evans, Hayley Atwell, Sebastian Stan, ...
- Genres: Action, Adventure, Sci-Fi
- Plot Keywords: Scientist, Tesseract, War Bond, ...



Sherlock Holmes: A Game of Shadows

- Director: Guy Ritchie
- Writers: Michele Mulroney, Kieran Mulroney, Arthur Conan Doyle
- Cast: Robert Downey Jr., Jude Law, Noomi Rapace, ...
- Genres: Action, Adventure, Crime, Mystery, Thriller
- Plot Keywords: Investigation, Strasbourg France, Mauser Pistol, ...

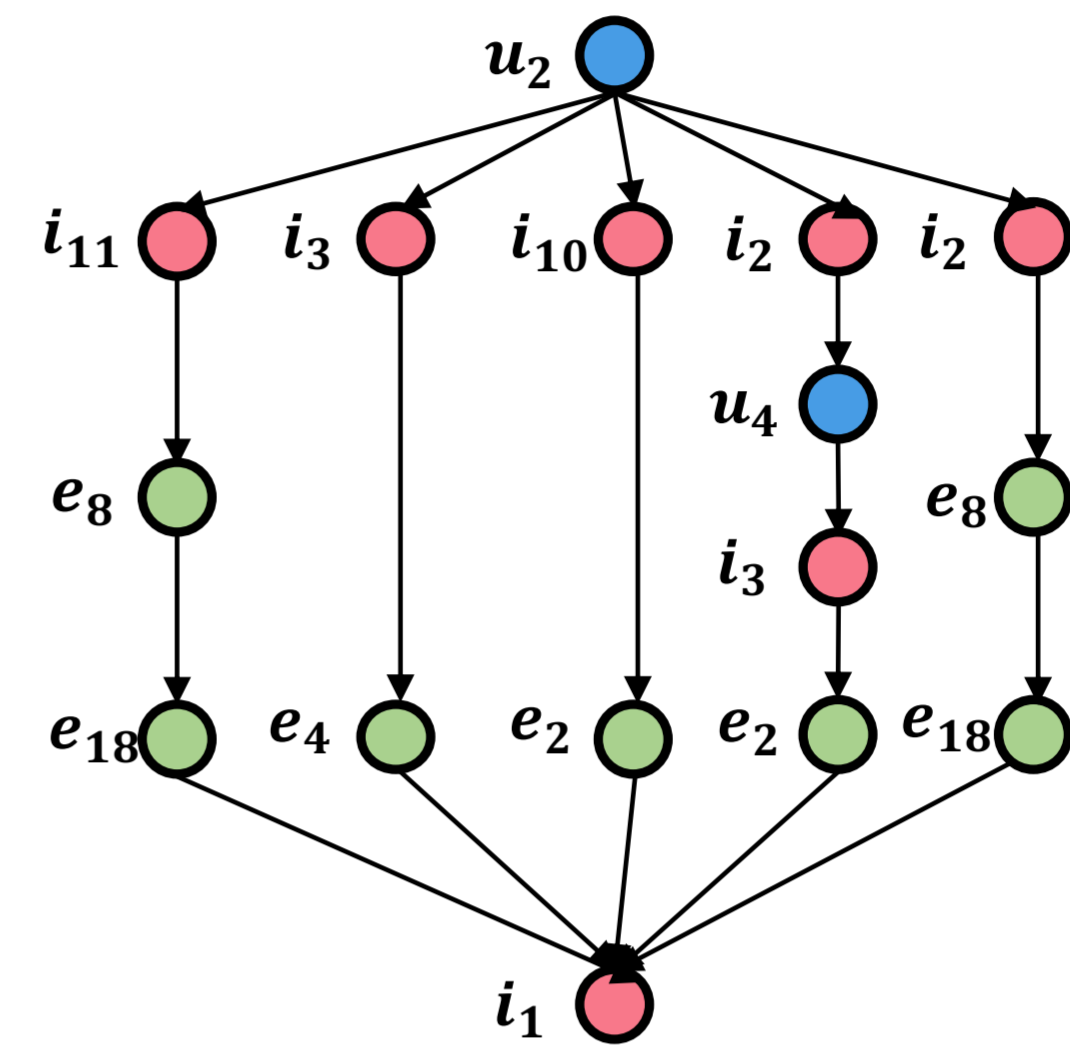
- We construct a recommendation knowledge graph that consists of the user-item interactions and additional knowledge graph.



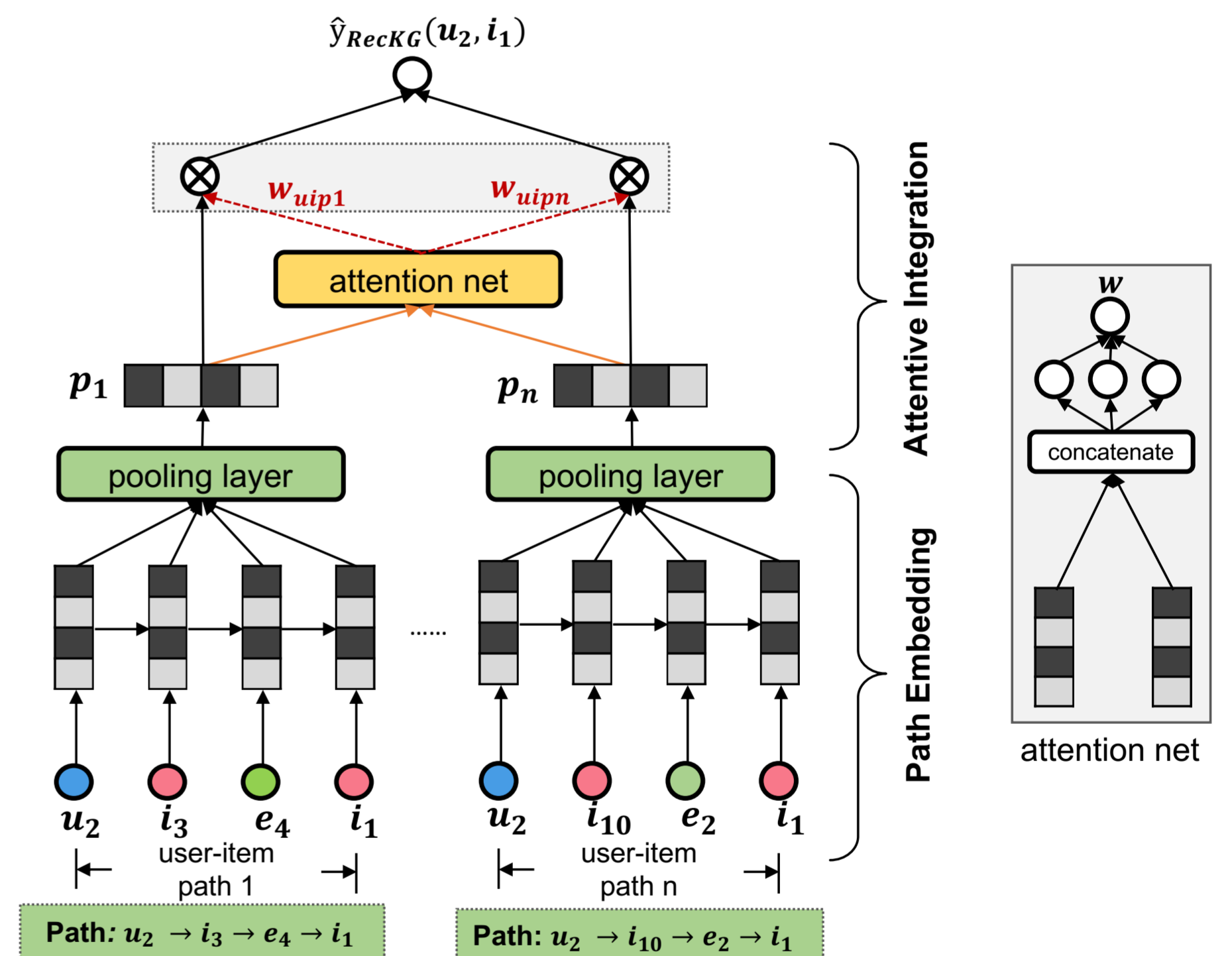
- Promising applications
 - Knowledge-aware recommender systems exhibit reasons behind a recommendation.
 - Using knowledge achieves high recommendation quality and extends user interests.

Knowledge-aware Recommendation

- We first employ a random walk to extract the paths connecting the user and the target item (i.e., reasons) from the recommendation knowledge graph.



- We next design an embedding model that can generate representations for each path and reweight the paths based on their importance.



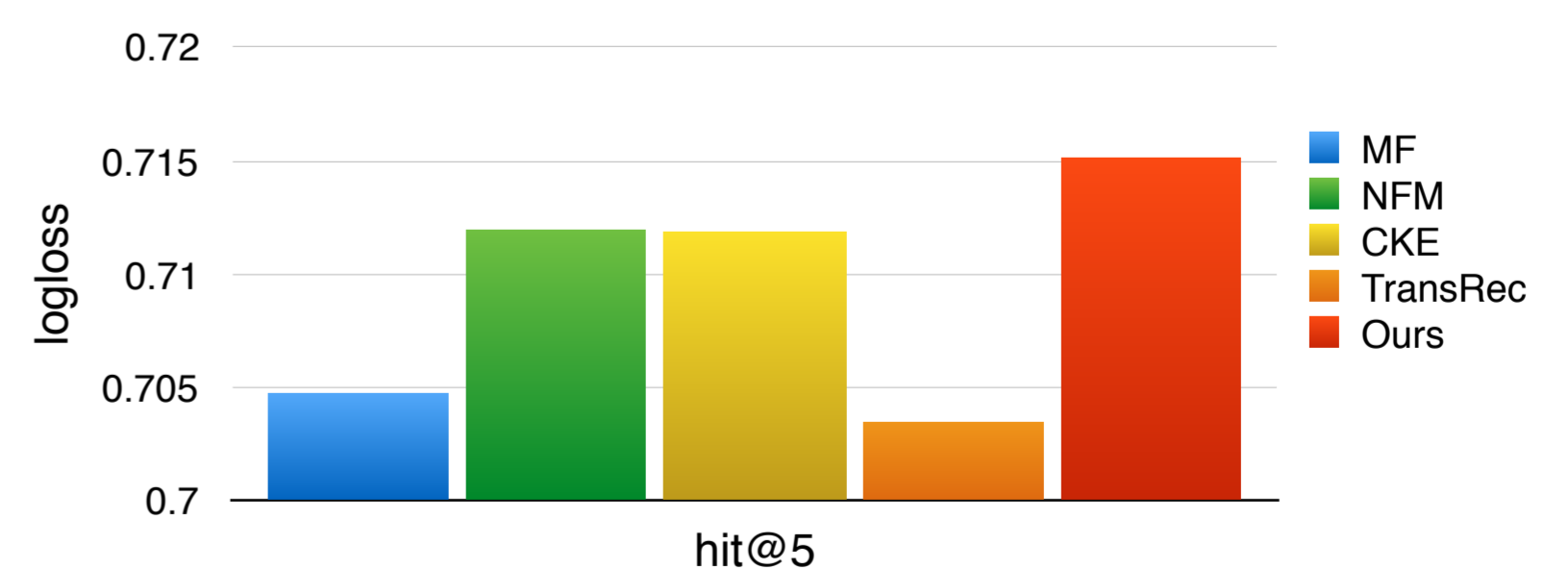
Experimental results

>> Dataset Statistics

- **MovieLens**
- **GoodBook**
- Open knowledge base: WikiData

Dataset	Recommender System			Knowledge Graph	
	#users	#items	#interactions	#entities	#triples
MoiveLens	13948	2555	306369	20458	45671
GoodBook	11947	3433	437348	2899	20765

>> Movie Recommendation



>> Reason

- u1 has interest in item 5 because:
 - she likes the <actor: Martin Freeman>, score: 0.97
 - she likes the <director: Toby Haynes>, score: 0.67