# Discussion

## **Laura Dietz**

University of New Hampshire

## **Alexander Kotov**

Wayne State University

## **Edgar Meij**

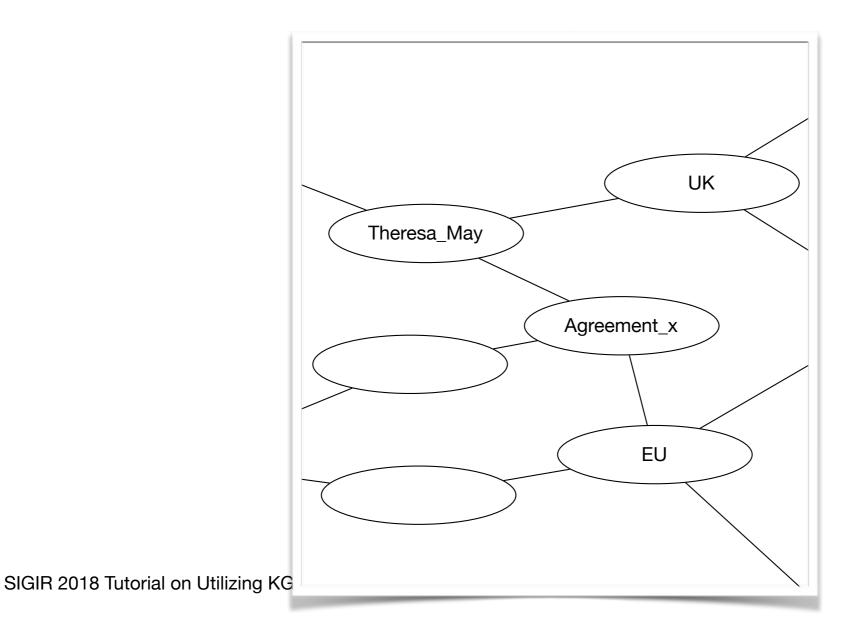
Bloomberg

## **Outline**

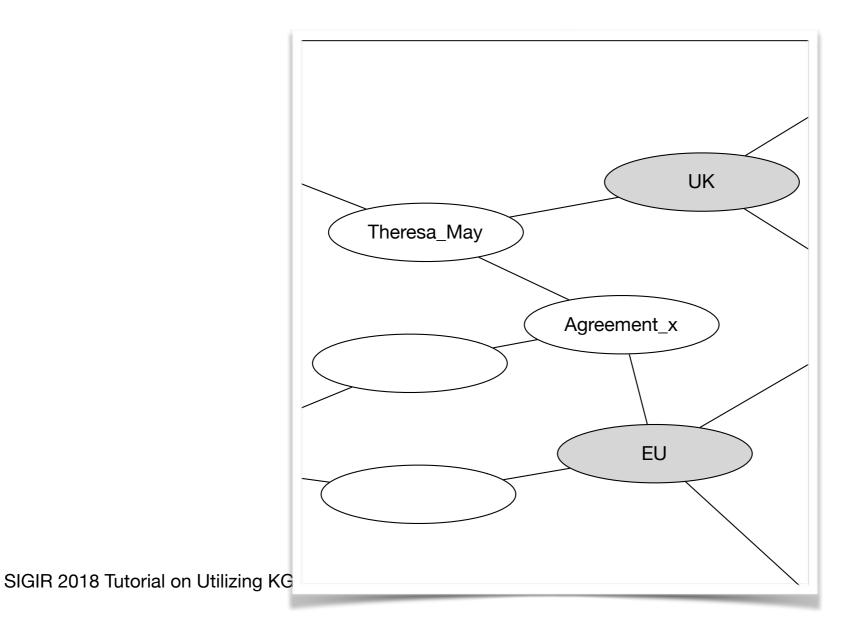
- Recap
  - outlook
  - open questions
- Q&A
- TREC CAR

- Entity linking/retrieval:  $q \mapsto \{(e, s)_1, \dots, (e, s)_n\}$ 

- Entity linking/retrieval:  $q \mapsto \{(e, s)_1, \dots, (e, s)_n\}$ 



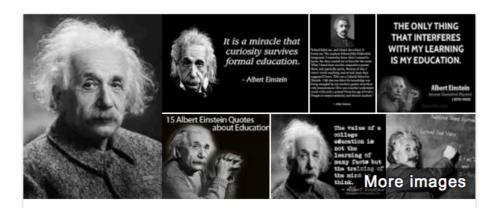
- Q: "UK EU relationships"



- Leverage obtained, possibly weighted, query relations and entities
  - as units of retrieval
  - to steer passage extraction
  - to guide a new round of retrieval
  - combine with document annotations
  - etc.

## **Entity cards**

- Ranking entities, attributes, facts for query entities
  - [Hasibi et al. 2017], [Voskarides et al. 2018]



## Albert Einstein



Theoretical Physicist

Albert Einstein was a German-born theoretical physicist. He developed the general theory of relativity, one of the two pillars of modern physics. Einstein's work is also known for its influence on the philosophy of science. Wikipedia

Born: March 14, 1879, Ulm, Germany

Died: April 18, 1955, Princeton, New Jersey, United States

Education: University of Zurich (1905), more

Awards: Barnard Medal for Meritorious Service to Science, more

Influenced: Satyendra Nath Bose, Wolfgang Pauli, Leo Szilard, more

Quotes View 7+ more

Imagination is more important than knowledge.

The important thing is not to stop questioning. Curiosity has its own reason for existing.

Anyone who has never made a mistake has never tried anything new.

(a) "einstein education"



## Albert Einstein



Theoretical Physicist

Albert Einstein was a German-born theoretical physicist. He developed the general theory of relativity, one of the two pillars of modern physics. Einstein's work is also known for its influence on the philosophy of science. Wikipedia

Born: March 14, 1879, Ulm, Germany

Died: April 18, 1955, Princeton, New Jersey, United States

Siblings: Maja Einstein

Spouse: Elsa Einstein (m. 1919–1936), Mileva Marić (m. 1903–1919)

Education: University of Zurich (1905), more

Quotes View 7+ more

Imagination is more important than knowledge.

The important thing is not to stop questioning. Curiosity has its own reason for existing.

Anyone who has never made a mistake has never tried anything new.

(b) "einstein family"



## **Barack Obama**

4,689,620 followers on Google+

Barack Hussein Obama II is the 44th and current President of the United States, and the first African American to hold the office. Wikipedia

Born: August 4, 1961 (age 53), Honolulu, Hawaii, United States

Spouse: Michelle Obama (m. 1992)

Office: President of the United States since 2009

Presidential term: January 20, 2009 –
Parents: Ann Dunham, Barack Obama, Sr.

Siblings: Maya Soetoro-Ng, Mark Okoth Obama Ndesandjo, more

#### Recent posts

The economy is stronger since the financial crisis hit six years ago today, but there's still more work to do: http://ofa.bo/f0uq 15 Sep 2014

### People also search for

View 15+ more

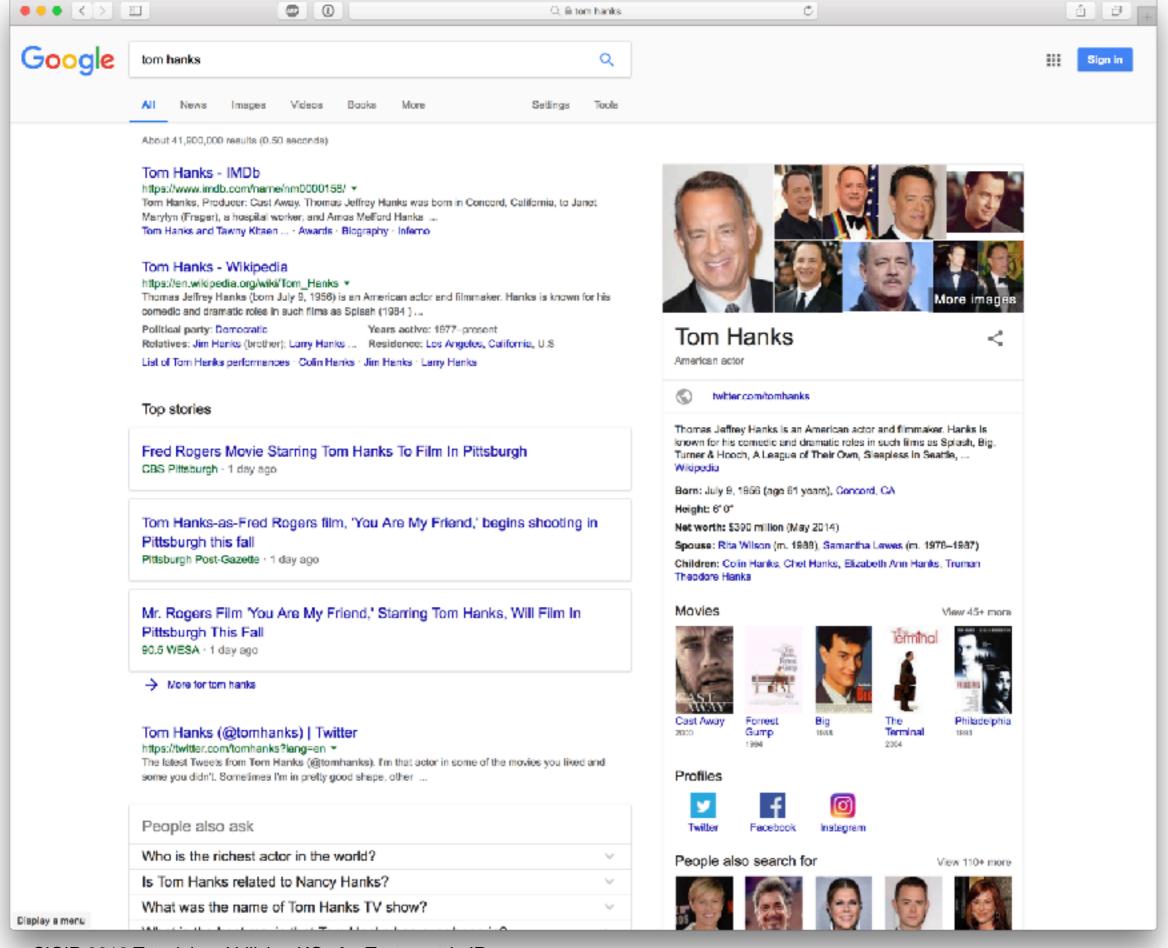


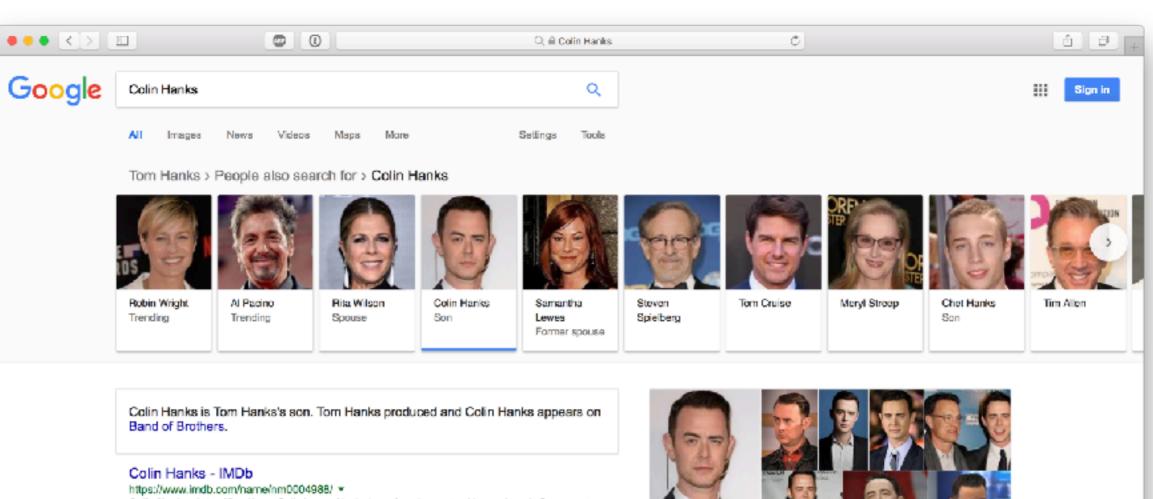


Michelle Obama Spouse Vladimir Putin George W. Bush

Hillary Rodham Clinton

Mitt Romney





Collin Hanks, Actor: King Kong, Colin Lewes Hanks is an American actor. He was born in Sacramento, California, to actors Samantha Lewes and Tom Hanks.

Colin Hanks in Band Aid · Biography · Awards · Photo Gallery

#### Colin Hanks - Biography - IMDb

https://www.imdb.com/name/nm0004988/bio \*

Colin Lewes Hanks is an American actor. He was born in Sacramento, California, to actors Samantha. Lewes and Tom Hanks. Colin is best-known for his ...

#### Colin Hanks - Wikipedia

https://en.wikipedia.org/wiki/Colin Hanks \*

Colin Lewes Hanks is an American actor and documentary filmmaker. He is known for starring as characters in films such as Shaun Brumder in Orange County, ...

Relatives: Rits Wilson (stepmother) Years active: 1996-present

Parent(s): Tom Hanks; Samantha Lewes

Early life · Career · Personal life · Filmography

#### Videos



The Incredible Colin Hanks la Here!



Actor Colin Hanks Reveals When He Realized His Dad Was



Colin Hanks on new comedy, his famous dad and step-mom's cancer





American actor

Colin Lewes Hanks is an American actor and documentary filmmaker. He is known for starring as characters in films such as Shaun Brumder in Orange County, Preston in King Kong, Oliver in The House Bunny, and Troy Gable in The Great Buck Howard, Wikipedia

Born: November 24, 1977 (age 40 years), Sacramento, CA

Height: 6"2"

Spouse: Samantha Bryant (m. 2010) Parents: Tom Hanks, Samantha Lewes.

#### Quotes

I didn't want to come up with some generic Johany Bravo type name. I'm not that cool, so I might as well stick with my birth name.

My ded has always been extremely supportive in every decision I'vemade and much more interested in me picking what I wanted to do.

Religion theme aside, most of the time I'm in some sort of comedy and I'm a straight man and it's really just, let's wind this guy up and see him explode.

Movies and TV shows

View 35+ more

Display a menu

## KGs for conversational search

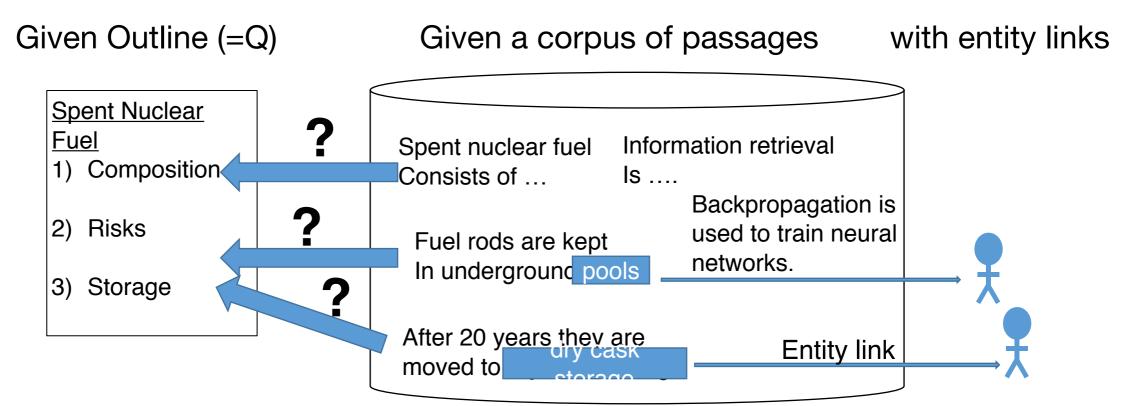
- QA++
- "Personalized" vs "Global" (background) knowledge
  - hyperlocal
- Also: procedural?

## Outlook / Open questions

- KG incompleteness and closed world assumptions
- How to best use graph structure?
- Federated search and federated KGs: how to represent verticals, merge information, etc. Evaluation?
- Long-tail and out-of-KG entities. On the fly information extraction?
- KGs are not static things: how do you decide the KG does not contain the "required" information? Does it not exist or is the representation inaccurate/insufficient/...?
- Explainability: how did the system arrive at a ranking using KGs?
- Multi-linguality: documents, queries, KGs
- Searching beyond entities, e.g., relations, attributes/properties, etc.,
- And beyond "ad hoc" retrieval: how to represent users, tasks, and context? Aspects?
  - Query "subtopics"

# TREC Complex Answer Retrieval (CAR)

trec-car.cs.unh.edu



Your task:

- a) Which passages should go in this article?
- b) Which section should they go in?

# Q&A

## Wrap-up

Slides at <a href="http://github.com/laura-dietz/tutorial-utilizing-kg">http://github.com/laura-dietz/tutorial-utilizing-kg</a>

Bibliography at <a href="https://www.mendeley.com/community/entity-linking-and-retrieval/">https://www.mendeley.com/community/entity-linking-and-retrieval/</a>

Laura Dietz (@lauradietz99) Alexander Kotov (@rusillini) Edgar Meij (@edgarmeij)