

NLP for the Enterprise

One year later

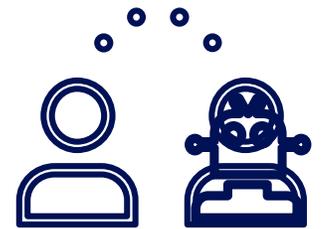
Claudiu Musat



swisscom



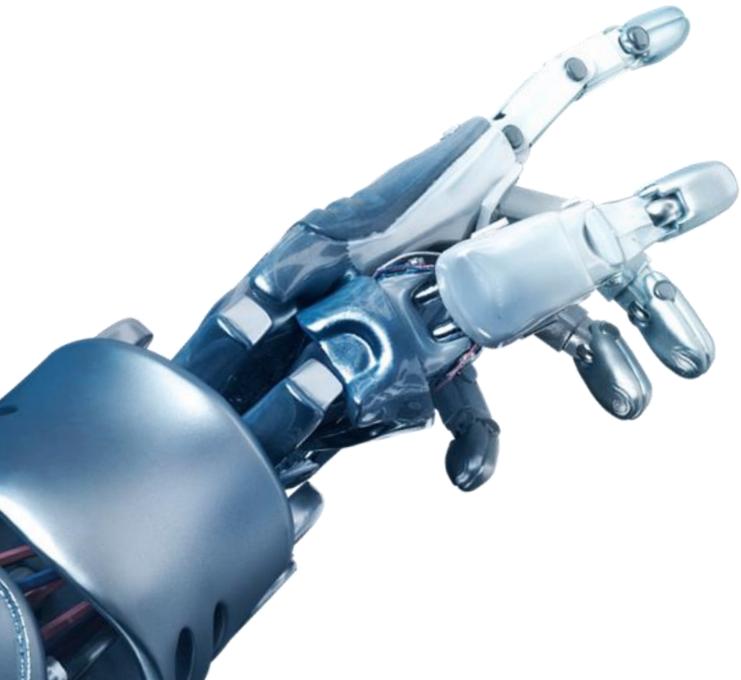
swisscom





The Past...

Paradigm Shift:
The machine reaches out to us.

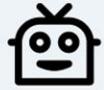


Useful AI Cycle



Data-constrained NLU – Sequence Tagging

List some classic gangster movies...



I love your question about **movies** ... :-)

I will make an API call with this detected information.

genre: **gangster**

what was the movie that featured that song over the rainbow

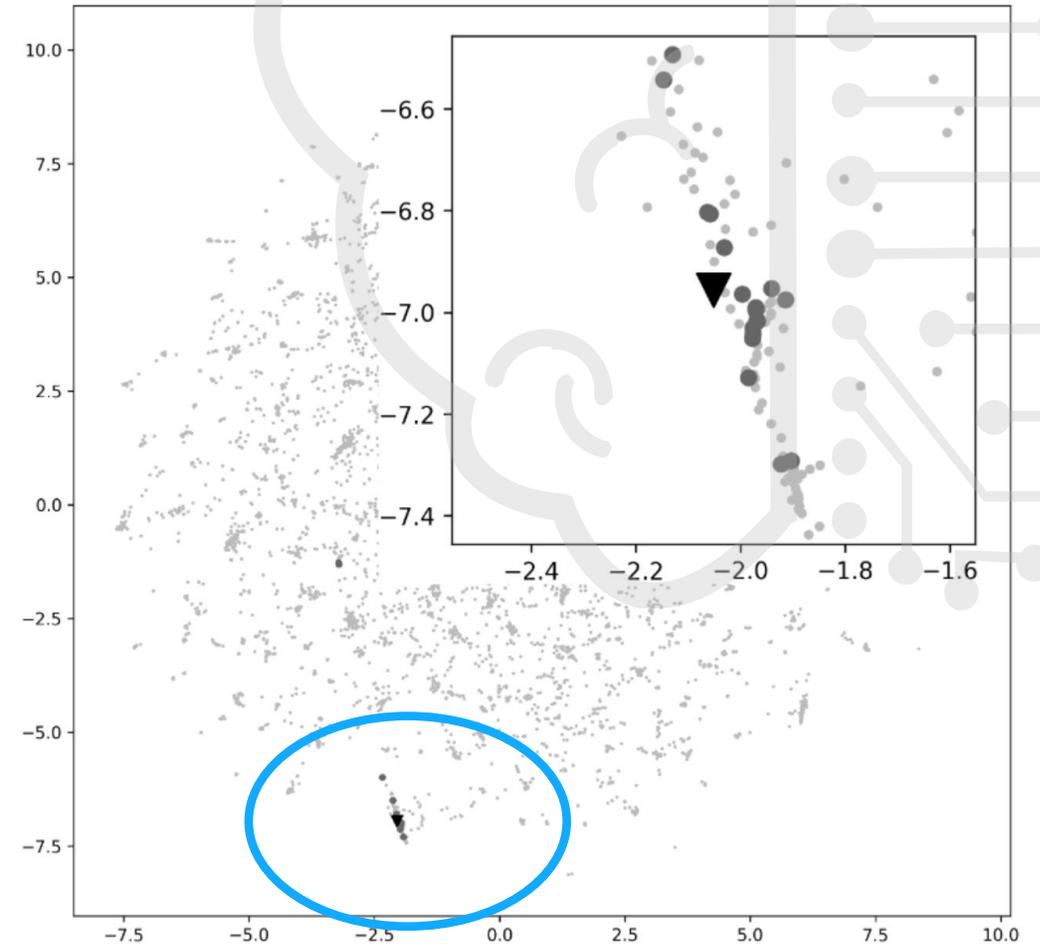
find me the movie with the song over the rainbow

what movie was the song somewhere out there featured in

what movie features the song hakuna matata

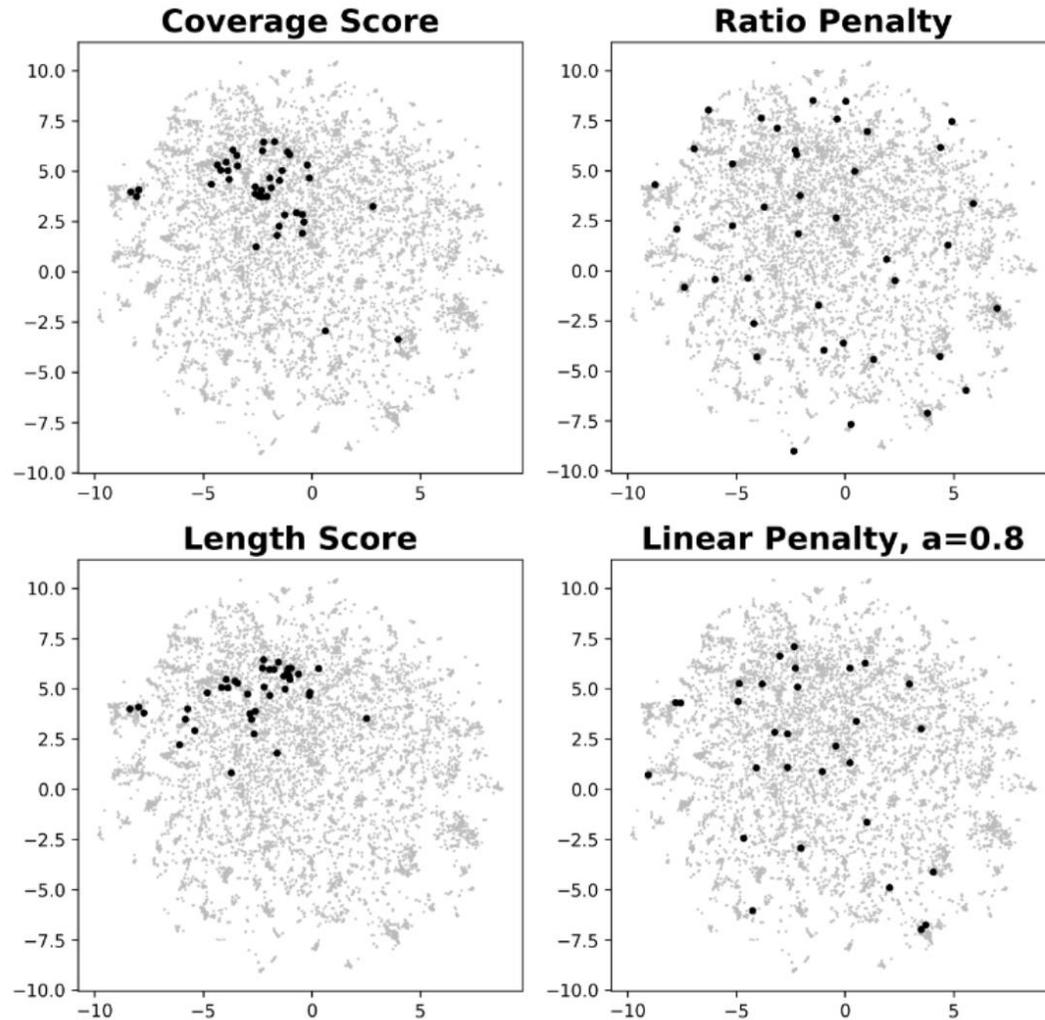
sow me a movie from the 1930s with the song somewhere over the rainbow

what movie uses the song tubthumping

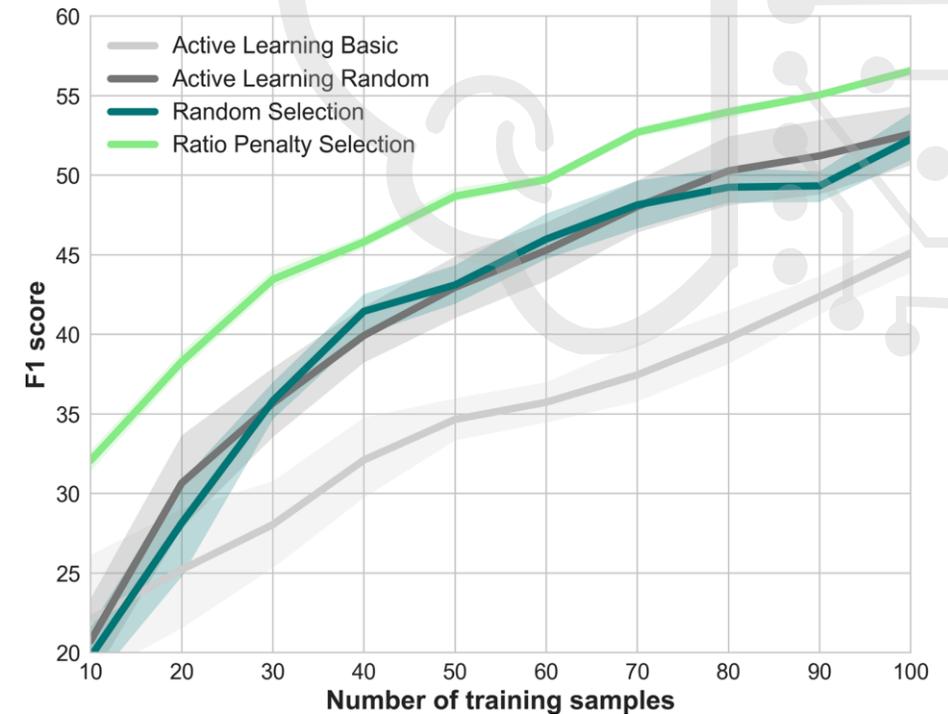


- *Submodularity-inspired data selection for goal-oriented chatbot training based on sentence embeddings*

Data-constrained NLU – Sequence Tagging



$$F(s|X) = \frac{\sum_{y \in V} \text{sim}(s, y)}{1 + \sum_{x \in X} \text{sim}(s, x)}$$



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Data-constrained NLU – Key Phrases

Support The Guardian | Subscribe | Find a job | Sign in | Search

News | Opinion | Sport | Culture

UK > UK politics | Education | Media | Society | Law | Scotland | Wales | North

Welfare | UK sick pay is found to breach international charter

Money available is 'manifestly inadequate' of social rights

Daniel Boffey in Brussels
Wed 24 Jan 2018 16:25 GMT

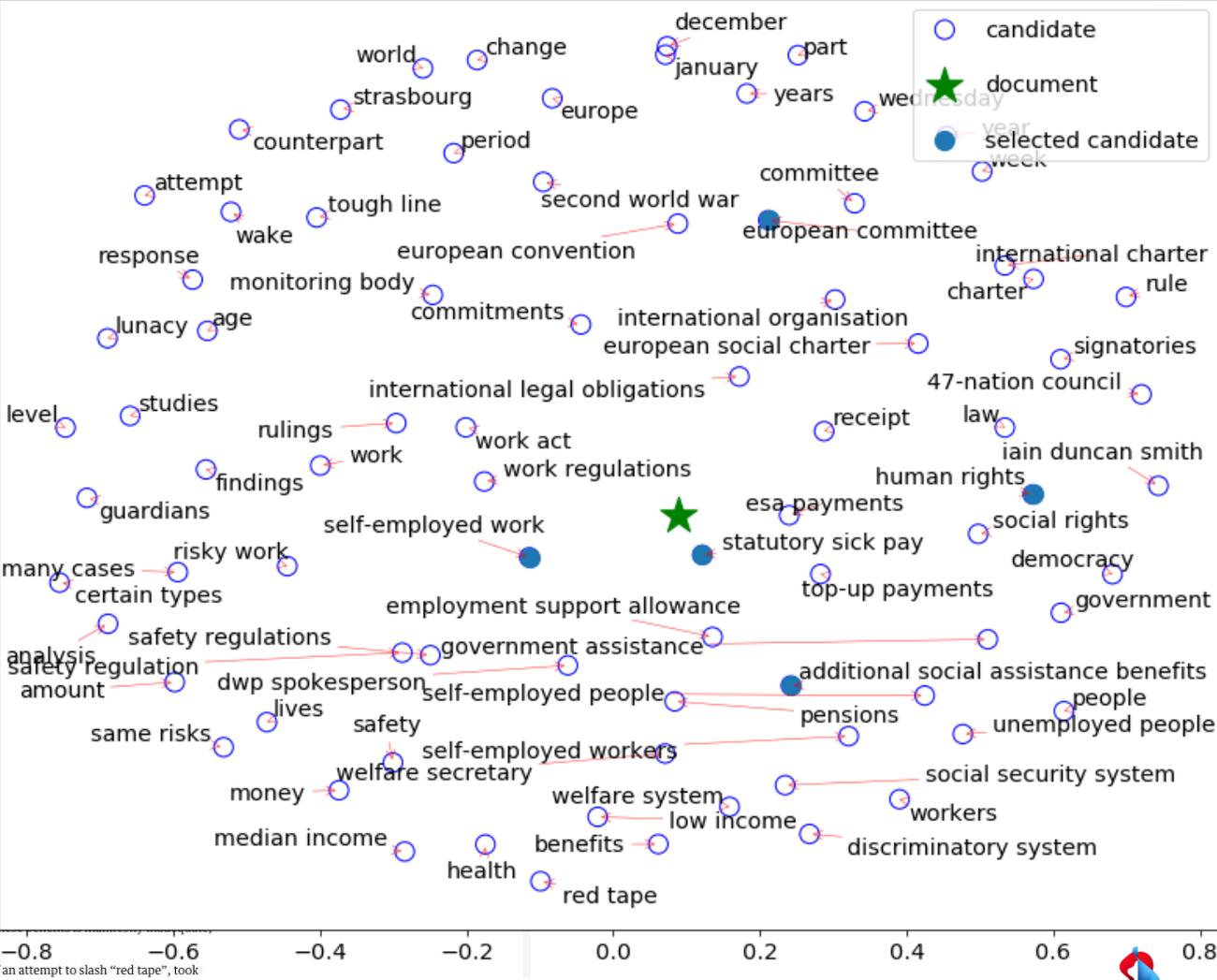
2,681

Statutory sick pay and government assistance for people in the UK have been found to breach international law, a monitoring body of the 47-nation Council of Europe, an international organisation formed in the wake of the second world war to protect human rights, democracy and the rule of law.

The committee found that sick and unemployed people were, in many cases, receiving less than 40% of the median income in the UK, which it said was £152.22 a week, although some were in receipt of top-up payments.

"Regardless of the additional social assistance the committee considers that the level of the committee said.

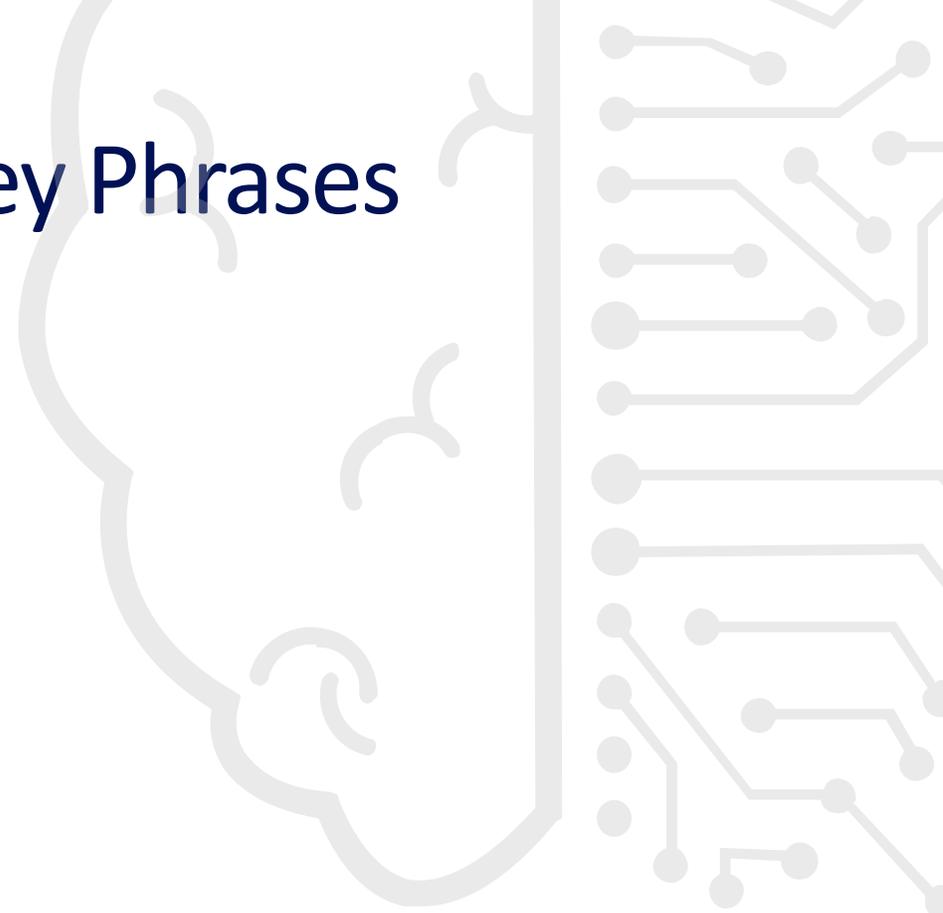
Three years ago the government, as part of an attempt to slash "red tape", took



- *EmbedRank: Unsupervised Keyphrase Extraction using Sentence Embeddings*

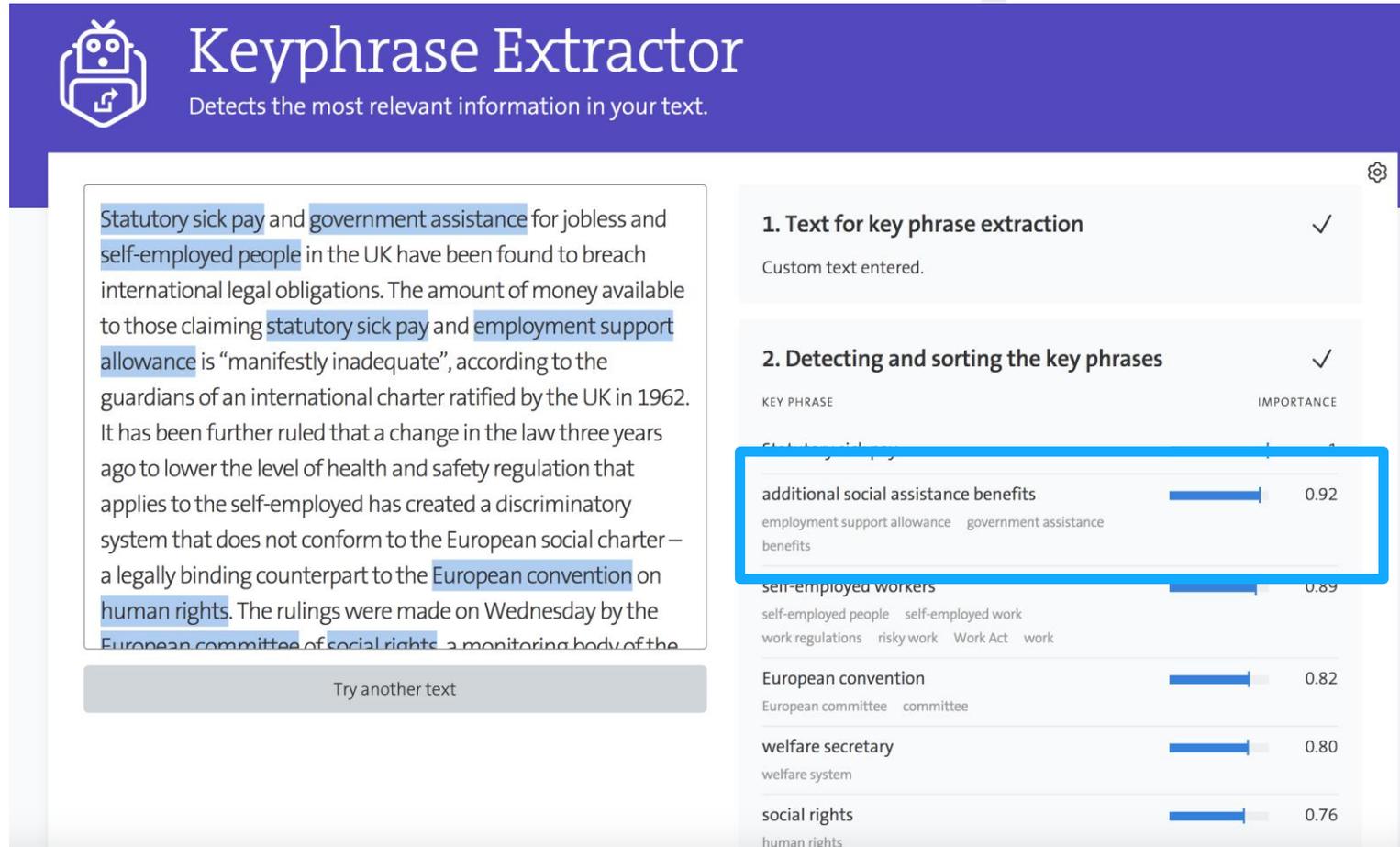


Data-constrained NLU – Key Phrases



- *EmbedRank: Unsupervised Keyphrase Extraction using Sentence Embeddings*

Data-constrained NLU – Key Phrases



Keyphrase Extractor
Detects the most relevant information in your text.

Statutory sick pay and government assistance for jobless and self-employed people in the UK have been found to breach international legal obligations. The amount of money available to those claiming statutory sick pay and employment support allowance is “manifestly inadequate”, according to the guardians of an international charter ratified by the UK in 1962. It has been further ruled that a change in the law three years ago to lower the level of health and safety regulation that applies to the self-employed has created a discriminatory system that does not conform to the European social charter – a legally binding counterpart to the European convention on human rights. The rulings were made on Wednesday by the European committee of social rights, a monitoring body of the

Try another text

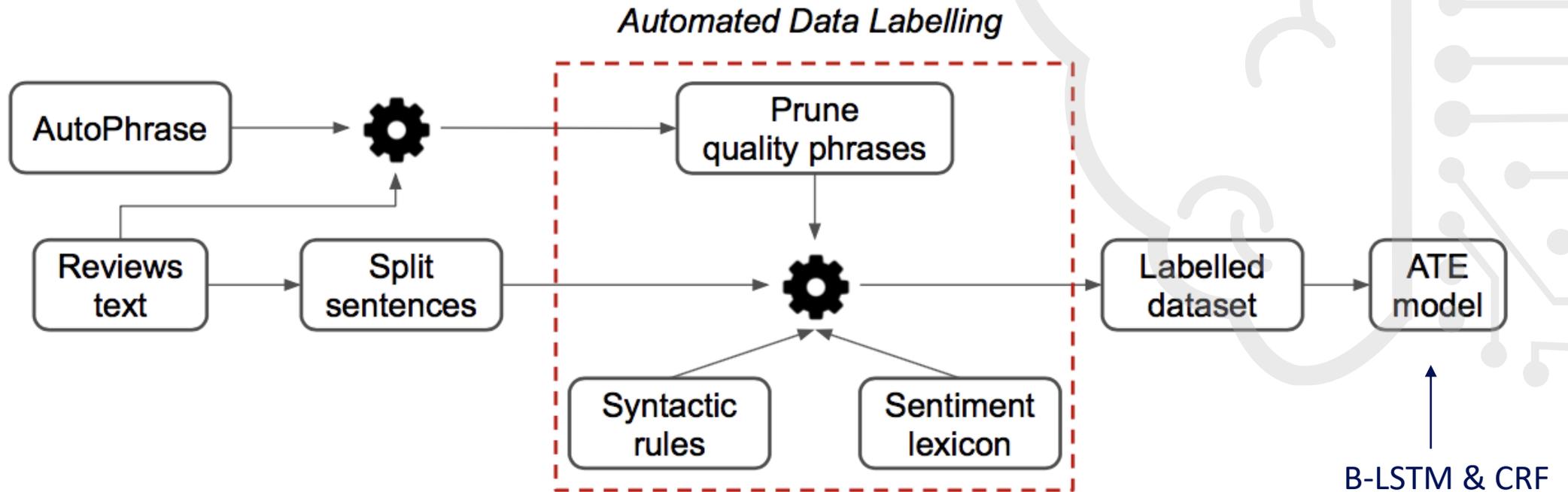
1. Text for key phrase extraction ✓
Custom text entered.

2. Detecting and sorting the key phrases ✓

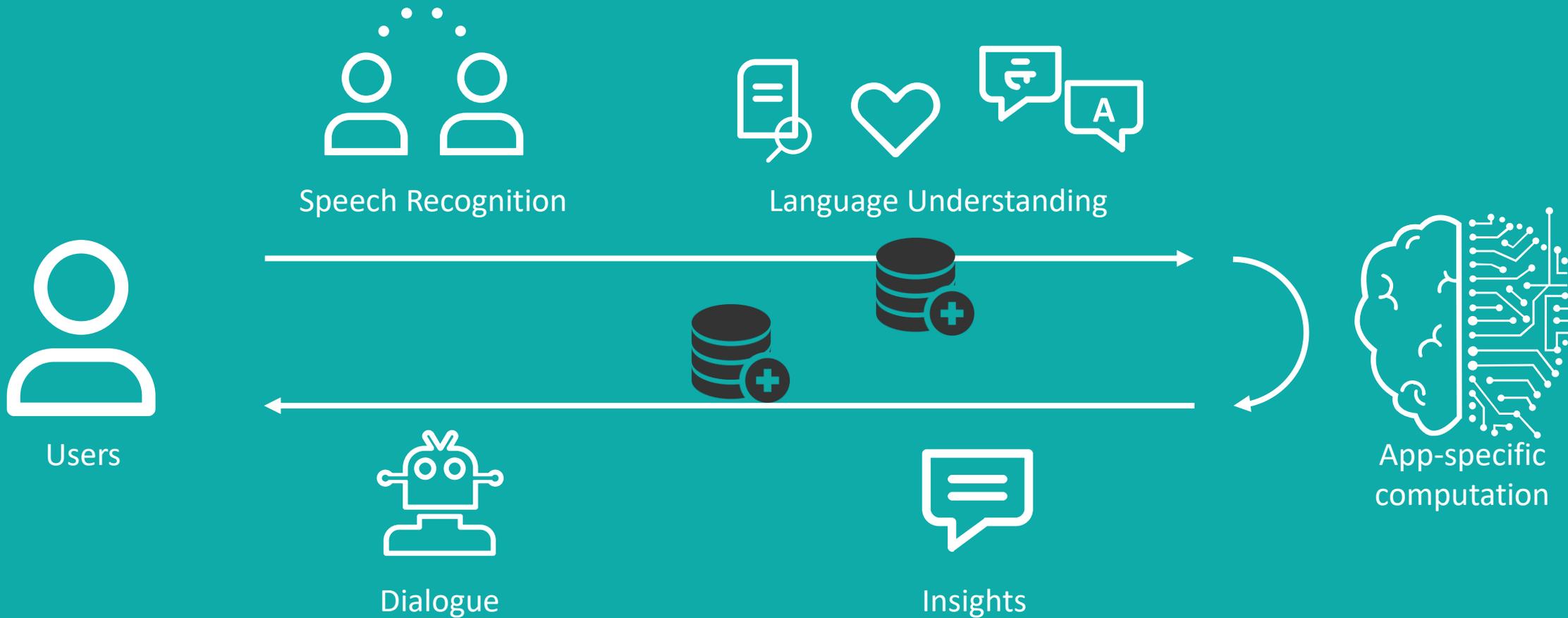
KEY PHRASE	IMPORTANCE
additional social assistance benefits employment support allowance government assistance benefits	0.92
self-employed workers self-employed people self-employed work work regulations risky work Work Act work	0.89
European convention European committee committee	0.82
welfare secretary welfare system	0.80
social rights human rights	0.76

- *EmbedRank: Unsupervised Keyphrase Extraction using Sentence Embeddings*

Data-constrained NLU – Opinion Targets



- *Unsupervised Aspect Term Extraction with B-LSTM & CRF using Automatically Labelled Datasets*
- *Dataset Construction via Attention for Aspect Term Extraction with Distant Supervision*



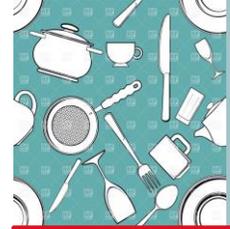
Data-constrained Dialogue Managers



Movie Booking Domain

- Source Domain
- Baseline paper
- Slots:
 - **city**
 - **date**
 - **number of people**
 - movie name
 - start time
 - theater
- User Goals
- Searchable Knowledge Base (KB)

inform_slots: {movie_name: "avengers", number_of_people: "3", date: "tomorrow"}, request_slots: {city, theater, start_time}



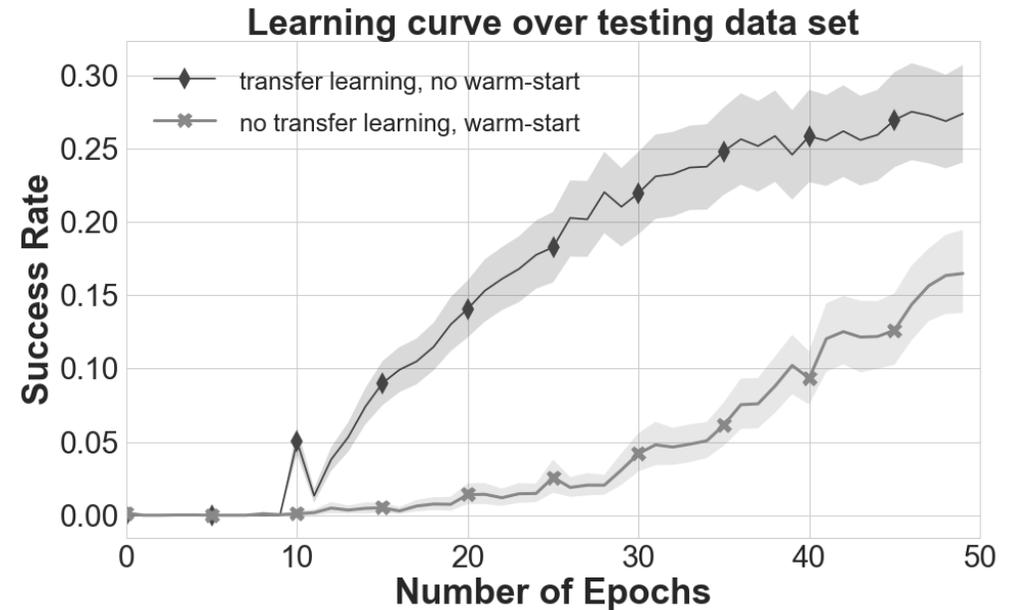
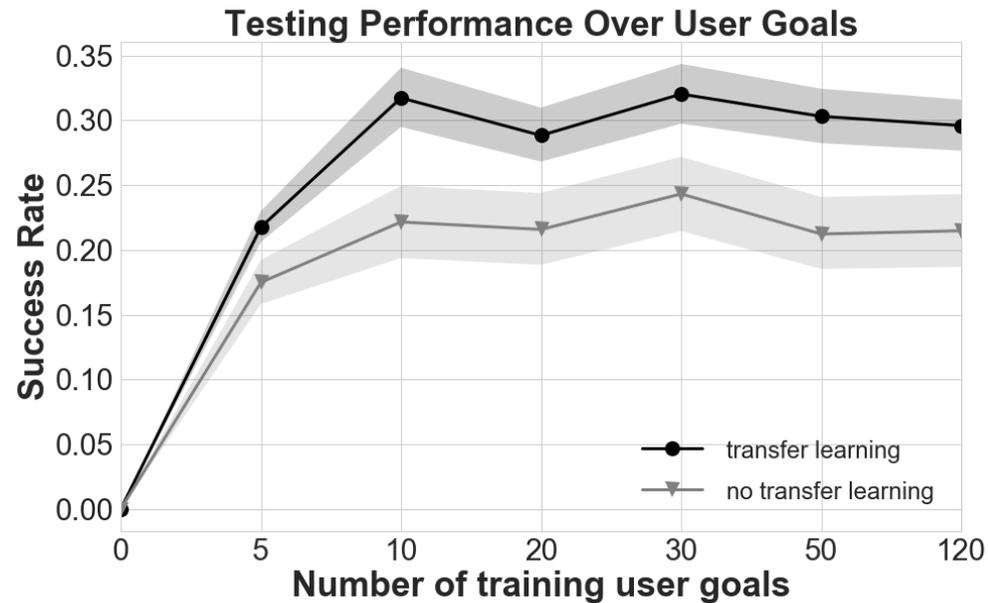
Restaurant Booking Domain

- Target Domain
- Derived from DSTC 2
- Slots:
 - **city**
 - **date**
 - **number of people**
 - food
 - price range
 - address
- User Goals
- Searchable Knowledge Base (KB)

inform_slots: {food: "Chinese", city: "London", number_of_people: 2}, request_slots: {price_range, date, addr}

- *Goal-Oriented Chatbot Dialog Management Bootstrapping with Transfer Learning*

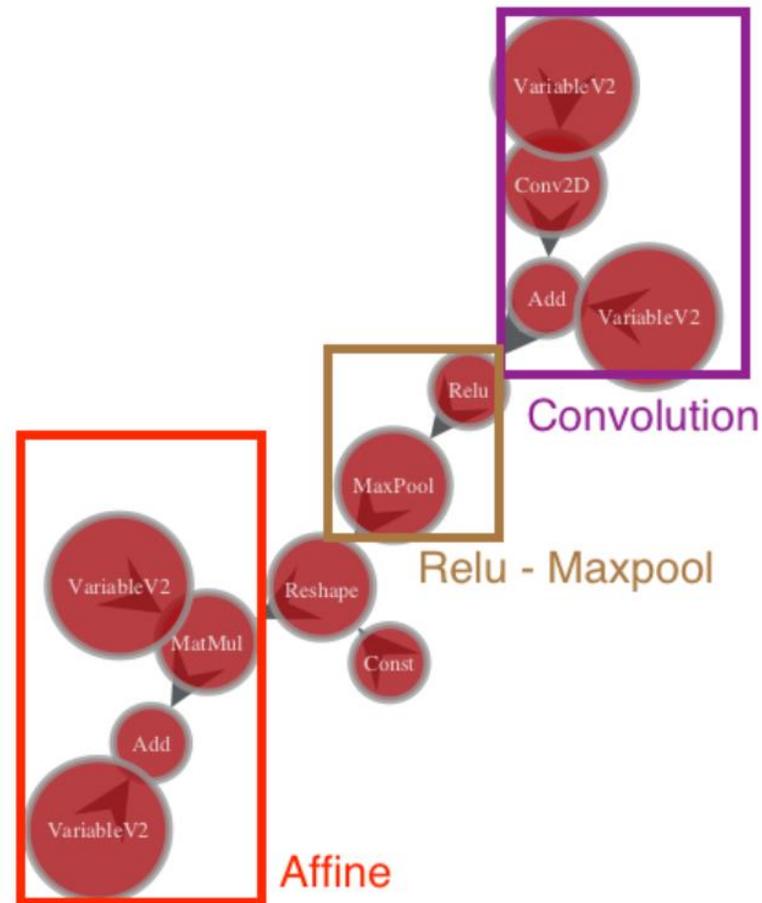
Transferring dialogue policies



- *Goal-Oriented Chatbot Dialog Management Bootstrapping with Transfer Learning*



Auto ML: Use Github to for a better search space





Diverse Beam Search for Increased Novelty in Abstractive Summarization

by . rob preece . published : . 07:47 est , 30 june 2012 . | . updated : . 08:14 est , 30 june 2012 . tony blair has reiterated his desire to return **to frontline politics** , speaking about it for the second time in a week . the former labour premier , who left downing street in 2007 after 10 years in power , said he missed being prime minister and was keen to secure a top international job . he said he would have considered the posts of president of the eu or the world bank if they had been offered to him . and he suggested that the experience [...] he admitted in another interview that he would like to be prime minister again . mr blair , now 59 , has used his contacts made in downing street to build a multi-million-pound business empire since leaving office . [...]

the former labour premier , who left downing street in 2007 after 10 years in power , said he missed being prime minister and was keen to secure a top international job . he said he would have considered the posts of president of the eu or the world bank if they had been offered to him .

he said he missed being prime minister and was keen to **come back to frontline politics** . blair , a middle east envoy , has used contacts made in downing street to build a multi-million-pound business empire since leaving office . he said he would have considered the posts of president of the eu or the world bank if they had been offered to him .

