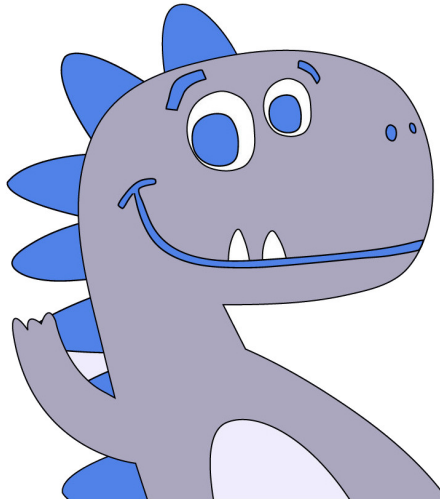


# Resources for Combining Teaching and Research in Information Retrieval Courses

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SIGIR 2024, July 14–18, Washington D.C., USA

**Maik Fröbe**, Harrison Scells, Theresa Elstner, Christopher Akiki, Lukas Gienapp, Jan Heinrich Reimer, Sean MacAvaney, Benno Stein, Matthias Hagen, and Martin Potthast

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# Resources for Combining Teaching and Research in IR Courses

## The Humboldtian Ideal



[https://de.wikipedia.org/wiki/Wilhelm\\_von\\_Humboldt#/media/Datei:Wilhelm\\_von\\_Humboldt\\_Denkmal\\_-\\_HU\\_Berlin.jpg](https://de.wikipedia.org/wiki/Wilhelm_von_Humboldt#/media/Datei:Wilhelm_von_Humboldt_Denkmal_-_HU_Berlin.jpg)

### Wilhelm von Humboldt

- ❑ 1767–1835
- ❑ “Father” of the modern university  
[Thornton’09]

Humboldt argued that teaching and cutting-edge research go hand in hand.

[Stichweh’94]

TLDR:

Teaching = Research

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Research in IR is driven by shared tasks. Connecting IR labs to shared task can be an improve the **unity of research and teaching**.

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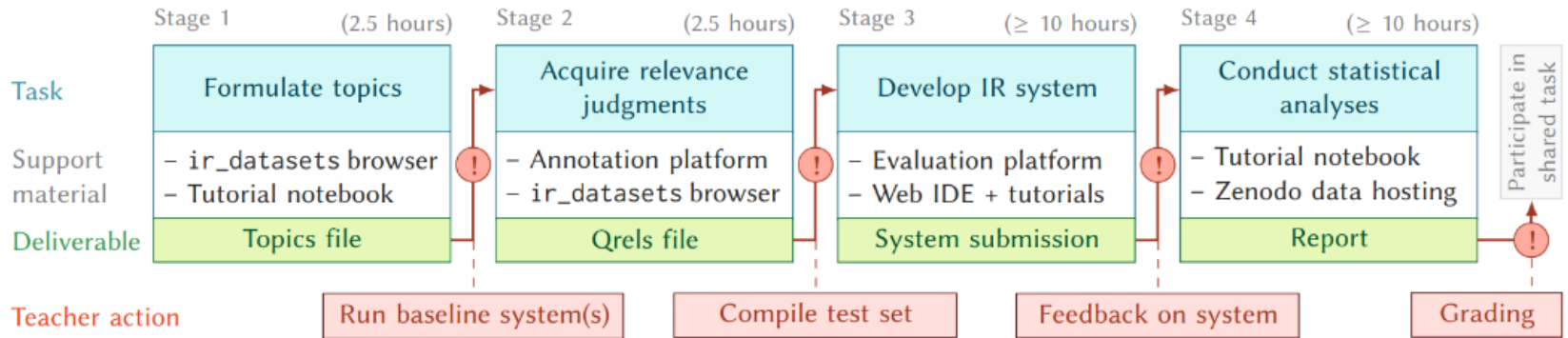
Research in IR is driven by shared tasks. Connecting IR labs to shared task can be an improve the **unity of research and teaching**.

Did you ever wanted to participate with students in a shared task but could not?

Our resources aim at lowering the barrier to entry for shared tasks.

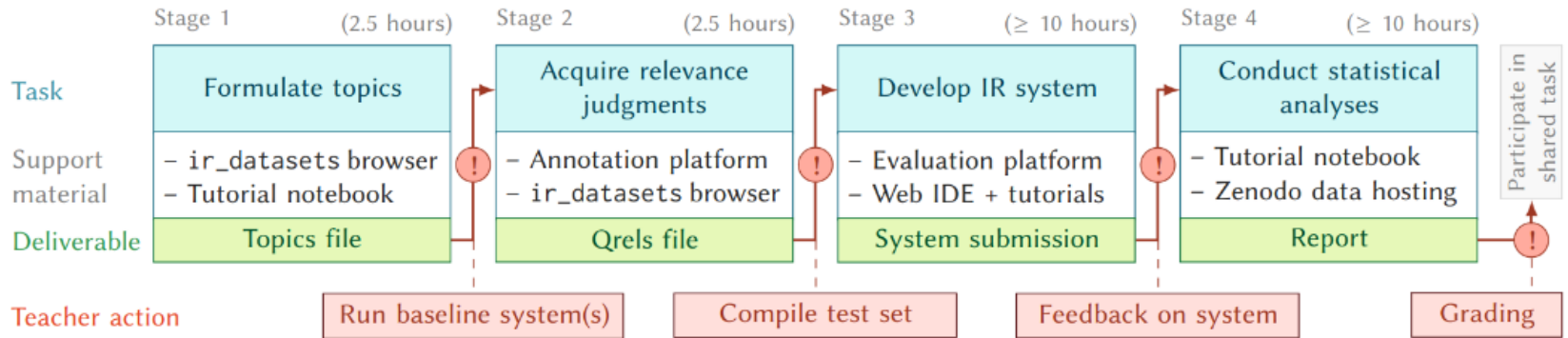
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## Realization: Shared Tasks by Students for Students



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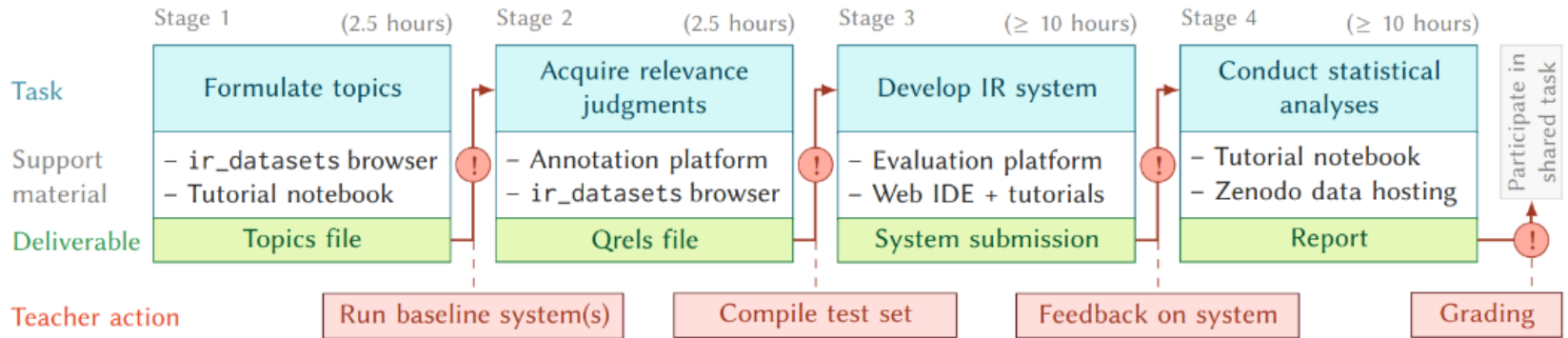
### Stage 1:

- ❑ Formulate an information need
- ❑ Support tutorial + ir\_datasets browser

				nDCG@10		
	Dataset	Num	Query	Minimum	Median	Maximum
<input checked="" type="checkbox"/>	jena-20231026	1	frequency solar storms	0	0.235	0.694
<input type="checkbox"/>	jena-20231026	2	popular pastries in germany	0	0.158	0.592
<input type="checkbox"/>	jena-20231026	3	flights Frankfurt to Rome	0	0	0
<input type="checkbox"/>	jena-20231026	4	remove wine stains	0	0.766	0.842

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## Realization: Shared Tasks by Students for Students



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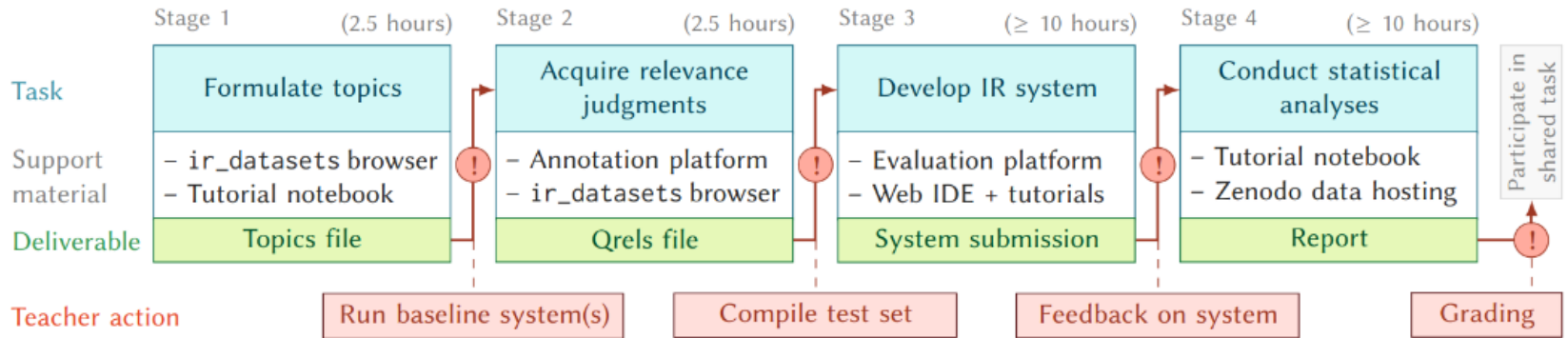
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<input type="checkbox"/> jena-20231026	4	remove wine stains				

System	nDCG@10 ↓	Relevance
golden-retrievers	0.694	
icy-guitar	0.694	
nippy-skin	0.307	

# Resources for Combining Teaching and Research in IR Courses

## Realization: Shared Tasks by Students for Students



### Stage 2:

- ❑ We pool a set of systems, aiming at shallow pools
- ❑ Conduct relevance judgments for your topic

relevant 1 not relevant 2

Speeding Up Neural Machine Translation Decoding by Cube Pruning

Although neural machine translation has achieved promising results, it suffers from slow translation speed. The direct consequence is that a trade-off has to be made between translation quality and speed, thus its performance can not come into full play. We apply cube pruning, a popular technique to speed up dynamic programming, into neural machine translation to speed up the translation. To construct the equivalence class, similar target hidden states are combined, leading to less RNN expansion operations on the target side and less softmax operations over the large target vocabulary. The experiments show that, at the same or even better translation quality, our method can translate faster compared with naive beam search by 3.3× on GPUs and 3.5× on CPUs.

Key	Value
group	3
query	retrieval system speed
doc_id	D18-1460
query_id	14
narrative	Relevant papers include research on what makes a retrieval system faster. Papers that focus on improving something else or

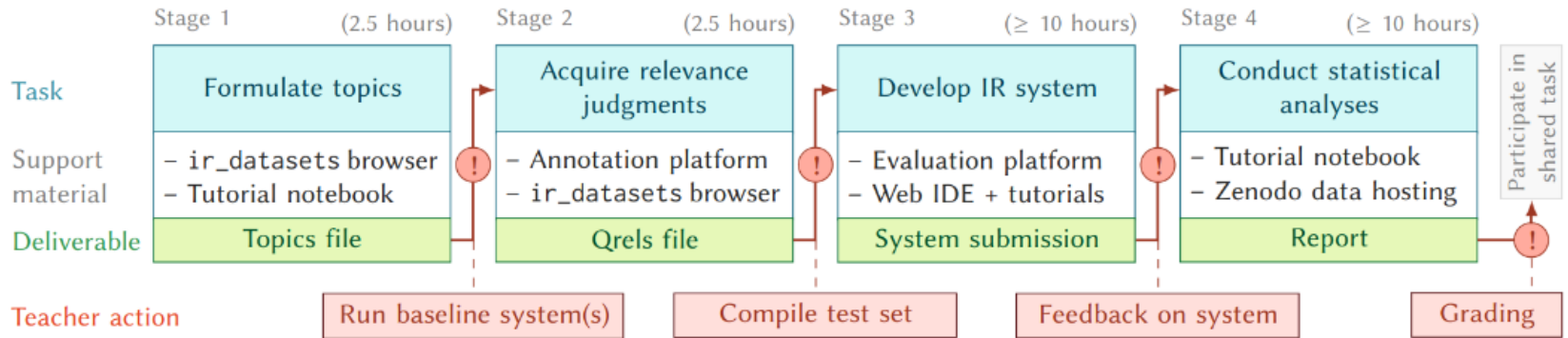
Progress

Total 52  
Complete 0  
0%



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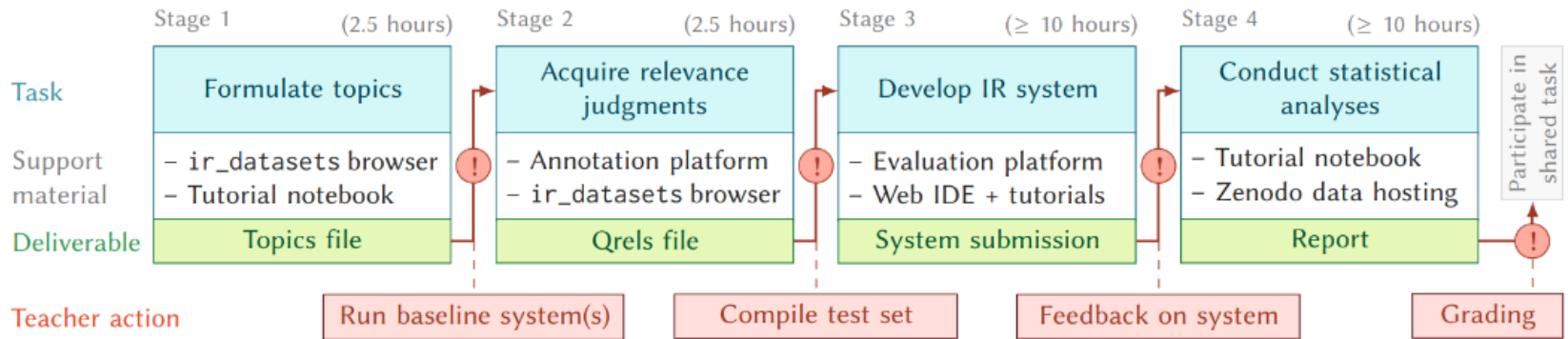


### Stage 3:

- ❑ Development of IR systems in prepared devcontainer
- ❑ Web IDE can directly boot into Docker image with all dependencies
- ❑ Submit systems to TIRA/TIREx via Github Action

# Resources for Combining Teaching and Research in IR Courses

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### Stage 4:

- ❑ Prepare Notebook with statistical analysis
- ❑ Re-run dockerized system on subsequent shared task

# Combining Teaching and Research in IR

## Conclusions and Future Work

- ❑ We create resources to combine teaching with research in IR
- ❑ Decoupling deadlines by enabling shared tasks by students for students
- ❑ The resources allow for synergies accross multiple universities
  - Last semester: Augsburg, Jena, Köln, Leipzig

Please do stop by at our poster to chat about combining teaching with research.

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A big thank you to the Dagstuhl seminar on research and education in IR/RS

# Thank you!