Information Retrieval

Winter

(in German: Information Retrieval)

Module-ID: FIN-INF-110307

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
IR	6	Winter	starting at 3.	1 Semester	english	Master

Link:	LSF
Limited accessability:	
Responsibility:	Andreas Nürnberger
Lecturer:	Andreas Nürnberger
Classes:	• Lecture *Information Retrieval* • Exercise *Information Retrieval*
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Informatik - M.Sc. DKE: Applied Data Science - M.Sc. DE: Methoden der Informatik - M.Sc. VC: Computer Science

Intended learning outcomes:
Students can:

1. Design and implement advanced index structures for heterogeneous data modalities (textual, images) leveraging platforms such as Apache Solr, Apache Lucene
2. Execute comprehensive text data pipelines, encompassing tokenization, normalization, stemming/lemmatization, and semantic enrichment for downstream retrieval tasks.

3. Integrate index construction with sophisticated pre-processing techniques and develop interactive, user-centric search interfaces.
4. Critically assess and benchmark retrieval system effectiveness using standard IR evaluation metrics (e.g., MAP, NDCG, Precision@k)
5. Translate foundational **Information Retrieval** (IR) theories into practice by architecting and deploying a functional search engine prototype.
6. Learning and implementing a functional search engine prototype

Content:

- Statistical properties of texts
- Retrieval models and data structures
- Relevance feedback
- Evaluation
- Structuring datasets (clustering, categorisation)
- Structure and algorithms for web search
- Interface design

Workload:
56h contact time + 124h self study

Pre-examination requirements:	**Type of examination:**	**Teaching method / lecture hours per week (SWS):**
	Written exam. Requirements for exam participation will be announced in the first week of the course in class and online.	• 2 SWS Lecture • 2 SWS Exercise class

Prerequisites according to examination regulations:	**Recommended prerequisites:**
none	

Media:	**Literature:**
	• Introduction to Information Retrieval, C.D. Manning, P. Raghavan, H. Schütze, Cambridge University Press, 2008. • Information Retrieval: Data Structures and Algorithms, William B. Frakes and Ricardo Baeza-Yates, Prentice-Hall, 1992.

Comments:

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