

# GIRSA-WP at GikiCLEF: Integration of Structured Information and Decomposition of Questions

Sven Hartrumpf<sup>1</sup> and Johannes Leveling<sup>2</sup>

- 1: Intelligent Information and Communication Systems (IICS)  
University of Hagen (FernUniversität in Hagen),  
Hagen, Germany
- 2: Centre for Next Generation Localisation (CNGL)  
Dublin City University  
Dublin, Ireland



CLEF 2009, 30 Sept. – 2 Oct., Corfu, Greece

# Outline

Motivation

System Description

Recursive Question Decomposition

Experiments

Results

Conclusions

Future Work

# Prior Work: QA, GIR, and their Combination

	InSicht	question answering system (participated at QA@CLEF 2004–2008)
+	GIRSA	geographic information retrieval system (participated at GeoCLEF 2006–2008)
=	GIRSA-WP	combination of methods (participated at GikiP 2008)

# GIRSA-WP

- ▶ **InSicht**: Wikipedia categories, infobox information → natural language description;  
Wikipedia articles and NL descriptions → syntactic-semantic parser WOCADI → semantic networks
- ▶ **GIRSA**: standard IR on geographically annotated documents (normalized location names etc.);  
index abstracts of Wikipedia articles, but as full-text (not on a per-sentence basis)
- ▶ **GIRSA-WP**: semantic filtering / EAT;  
merge results (combMAX);  
add multilingual results using links to other languages;  
add support snippets

# Question Decomposition on Topic GC-2009-07

*What capitals of Dutch provinces received their town privileges before the fourteenth century?*

→ *Name capitals of Dutch provinces.*

→ *Name Dutch provinces.*

= *Zeeland* (support from article 1530: *Besonders betroffen ist die an der Scheldemündung liegende niederländische Provinz Zeeland.*)

→ *Name capitals of Zeeland.*

= *Middelburg* (support from article *Miniatuur Walcheren: ... in Middelburg, der Hauptstadt von Seeland (Niederlande).*)

= *Middelburg* (answer to revised question can be taken without change)

→ *Did Middelburg receive its town privileges before the fourteenth century?*

= *Ja./Yes.* (support from article *Middelburg: 1217 wurden Middelburg durch Graf Willem I. ... die Stadtrechte verliehen.*)

= *Middelburg* (support: three sentences, from three articles, see above)

⋮

# Experiments

Three runs:

- ▶ **Run 1:** only results from InSicht.
- ▶ **Run 2:** results from InSicht and GIRSA, using a standard query formulation and a standard IR model (tf-idf) in GIRSA.
- ▶ **Run 3:** results from InSicht and GIRSA, using a Boolean conjunction of the standard query formulation employed for GIRSA and (at most two) keywords extracted from the topic.

# GIRSA-WP Results for GikiCLEF 2009

Run	Answers	Correct answers	Precision	GikiCLEF score
1	38	30	0.7895	24.7583
2	994	107	0.1076	14.5190
3	985	142	0.1442	23.3919

# Conclusions

- ▶ GikiCLEF questions seem to be harder than QA@CLEF questions
- ▶ Temporal and geographical constraints pose additional problems for QA techniques
- ▶ Correct answers can often not be found in one step; instead, subproblems must be solved
- ▶ Indexing shorter (abstracted) Wikipedia articles returned a higher number of correct results
- ▶ The annotation of geographic entities in the documents ensured a relatively high recall
- ▶ GIRSA-WP's multilingual approach is too simple: it relies on the Wikipedia of one language (German) and adds linked articles in other languages



# Future Work

- ▶ Improve the use of additional information on Wikipedia pages (image captions, lists, categories, infoboxes, other tables)
- ▶ Improve multilingual support