

Semantic Media Adaptation and Personalization 2011



Evaluating Annotators Consistency With the Aid of an Innovative Database Schema

Zenonas Theodosiou, Olga Georgiou, Nicolas
Tsapatsoulis

Department of Communication & Internet Studies
Cyprus University of Technology

Introduction



★ Introduction

- Proposed Method
- Evaluating Annotators Consistency
- Results and Discussion
- Conclusions and Further Work

- **Problem:** Searching in an image repository of thousands of images which they have not explicit metadata assigned to them lead to the below issues:
 - Limited efficiency of annotation methods because lacks semantic meaning
 - Traditional text-based search engines gives poor results
- Making a complete and elaborate annotation on image repository:
 - Labor-intensive task
 - Time consuming task
 - Annotators express the view of a specific context and time
- It is not feasible to achieve globally true multimedia tagging due to the both inter-annotation and intra-annotation inconsistency

- ☑ Introduction
- ★ Proposed Method
- ☐ Evaluating Annotators Consistency
- ☐ Results and Discussion
- ☐ Conclusions and Further Work

Proposed Method⁽¹⁾



- We propose a novel approach for measuring annotator's consistency aiming at:
 - Identifying to which extend the user of unstructured vocabularies improves annotator's consistency at what cost
 - Investigating to which extend and under what prerequisites free annotation can lead to valid and useful image tagging
- The proposed method combines:
 - Two annotation approaches
 - A friendly user interface
 - An innovative database schema

- Introduction
- ★ Proposed Method
- Evaluating Annotators Consistency
- Results and Discussion
- Conclusions and Further Work

Proposed Method₍₂₎



■ Commandaria Portal

- <http://cis.cut.ac.cy/CommandariaPortal/>

Evaluating Annotators Consistency With the Aid of an Innovative Database Schema



Proposed Method⁽³⁾

- ☑ Introduction
- ★ Proposed Method
- ☐ Evaluating Annotators Consistency
- ☐ Results and Discussion
- ☐ Conclusions and Further Work

- Image Annotation
 - Using predefined set of keywords

People	Publications	Production Cycle	Dissemination	Time Period	Area
Select	Select	Select	Select	Select	Select
Select	Select	Select	Select	Select	Select
Producers	Legislation	Grape Cultivation	Cultural Events	Ancient Times	Cyprus
Wine Judges	Books	Grape Collection	Campaigns	Middle Times	Commandaria Region
Historical People	Research	Mellowing Draining	Public Advertisements	Modern Times	Other Region
Consumers	Wine Review	Wine Production	Private Advertisements		World
Writers		Consumption	Locations Places		
Merchant Dealer Trader			Stories Legends		

- Using free keywords

Annotate the file: **Restaurant Kelaki**

You can choose one keyword from each drop down category.

People	Publications	Production
Select	Select	Select

Select a language and type a free keyword

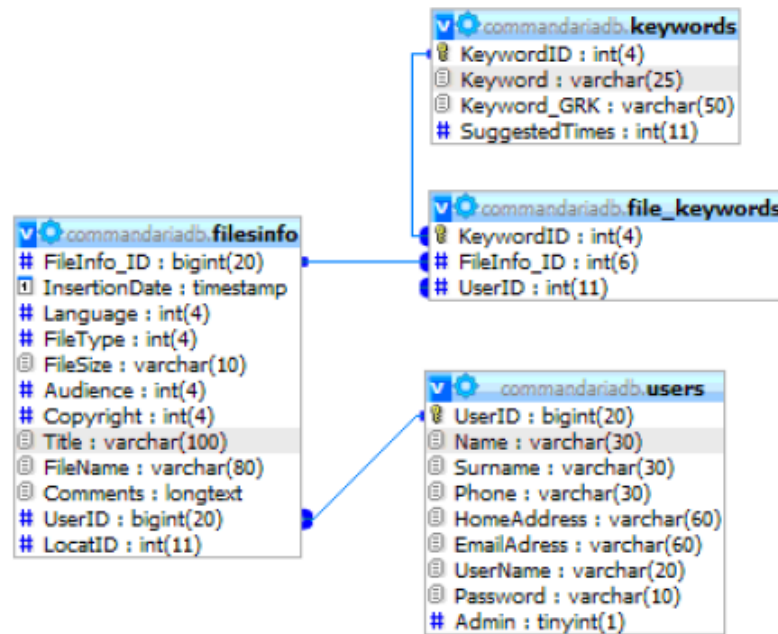
Select	<input type="text"/>
Select	
ENG	XML Annotation file: <input type="text"/>
GRK	<input type="button" value="Browse"/>

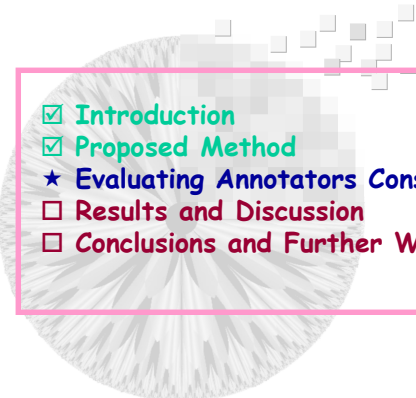


Proposed Method₍₄₎

- ☑ Introduction
- ★ Proposed Method
- ☐ Evaluating Annotators Consistency
- ☐ Results and Discussion
- ☐ Conclusions and Further Work

- Database Structure
 - The structure of the relational database



- 
- ☑ Introduction
 - ☑ Proposed Method
 - ★ Evaluating Annotators Consistency
 - ☐ Results and Discussion
 - ☐ Conclusions and Further Work

Evaluating Annotators Consistency



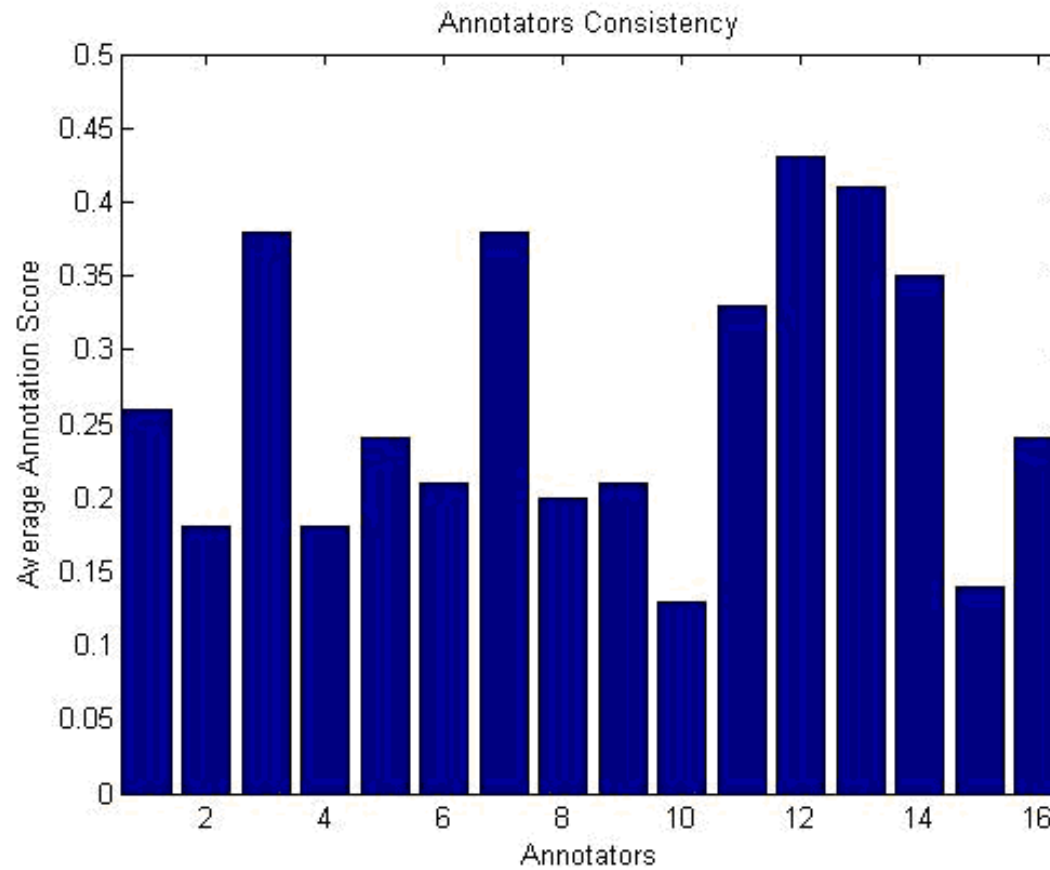
- Upon the annotation completion we performed a set of measurements:
 - Annotators consistency, based on the number of representative keywords suggested for each image
 - Effectiveness of vocabulary approach, based on total number of suggestions for each free keyword
 - Annotators mentality, based on the number of vocabulary and free keywords used by each annotator



Results and Discussion⁽¹⁾

- Introduction
- Proposed Method
- Evaluating Annotators Consistency
- ★ Results and Discussion
- Conclusions and Further Work

- Annotators Consistency using vocabulary keywords

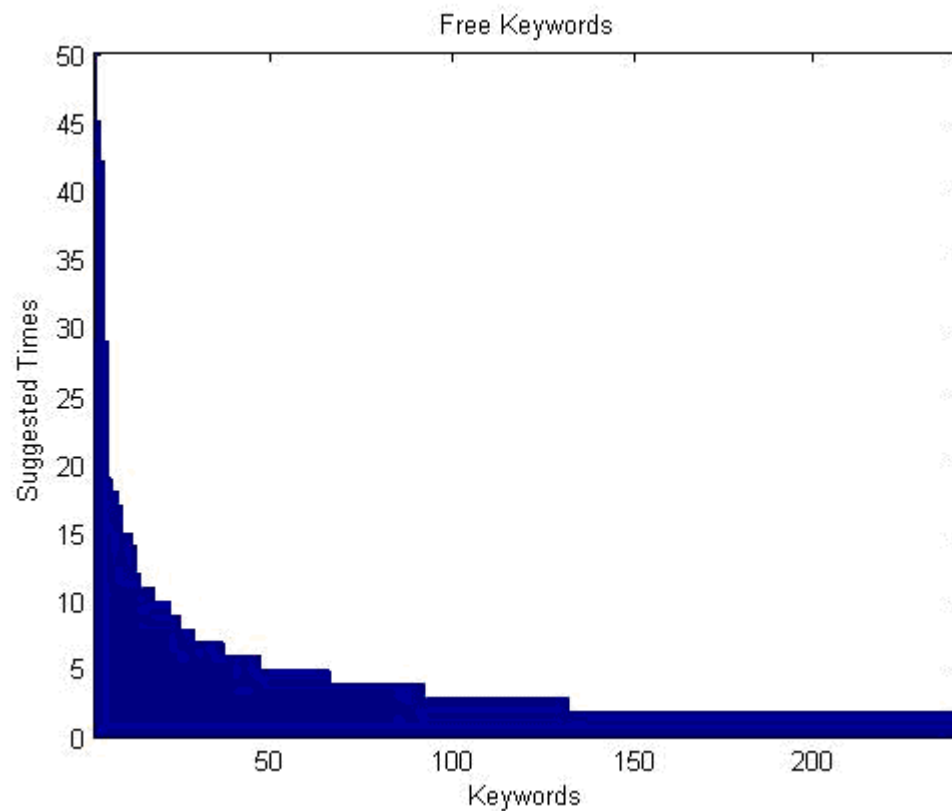


Results and Discussion(2)



- ☑ Introduction
- ☑ Proposed Method
- ☑ Evaluating Annotators Consistency
- ★ Results and Discussion
- ☐ Conclusions and Further Work

- The total number of suggestions for free keywords

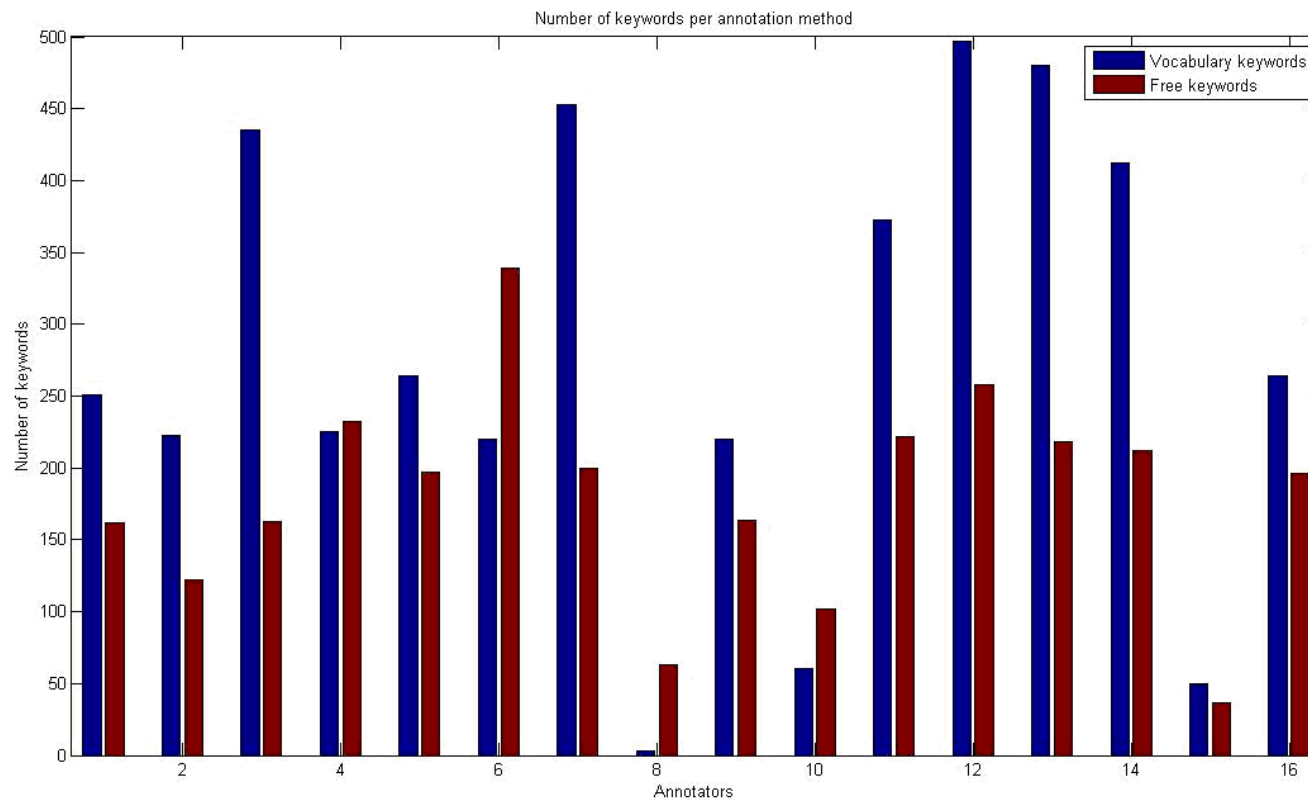


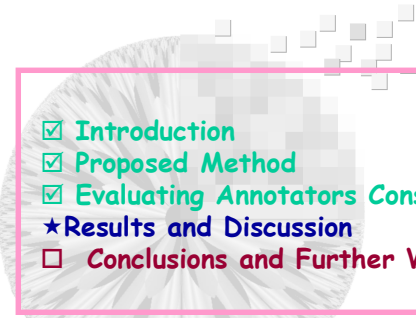
- ☑ Introduction
- ☑ Proposed Method
- ☑ Evaluating Annotators Consistency
- ★ Results and Discussion
- Conclusions and Further Work

Results and Discussion⁽³⁾



- The total number of vocabulary and free keywords submitted by each annotator

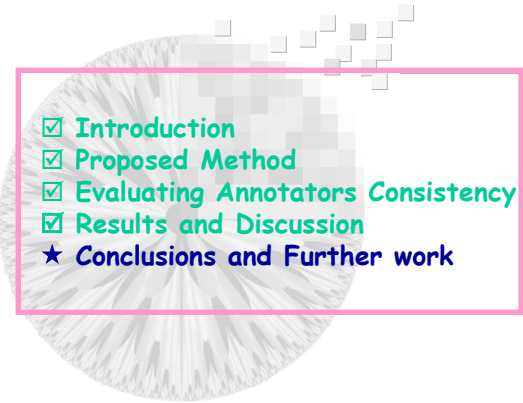


- 
- ☑ Introduction
 - ☑ Proposed Method
 - ☑ Evaluating Annotators Consistency
 - ★ Results and Discussion
 - ☐ Conclusions and Further Work

Results and Discussion⁽⁴⁾



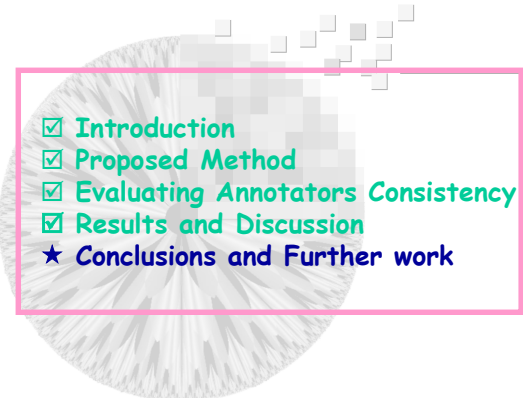
- The majority of annotators shows medium to low consistency
- Although all the annotators used the vocabulary keywords, few of them chose the same keywords for the same image. This behavior can be examined under two perspectives:
 - First, in terms of the limited perception of annotators regarding the keywords meaning
 - Second, in terms of different semantic mentality when viewing the same image
- The large amount of free keywords used identifies the weakness of the vocabulary keywords to cover all the important semantic keywords
- Some free keywords received a high number of suggestions indicating their importance

- 
- ☑ Introduction
 - ☑ Proposed Method
 - ☑ Evaluating Annotators Consistency
 - ☑ Results and Discussion
 - ★ Conclusions and Further work

Conclusions and Further work (1)



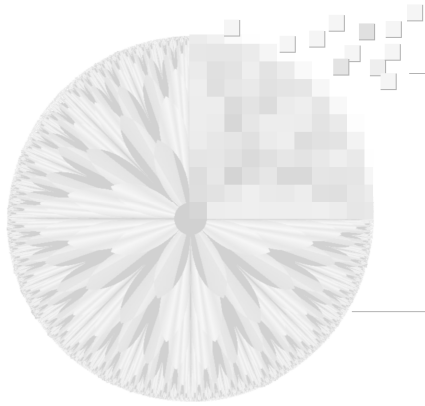
- The experimental results can not lead to the most preferable annotation approach but confirm our initial assumptions that the fusion of annotation approaches can give more accurate results
- The combination of the two annotation approaches with the aid of the innovative database schema can achieve more competitive results
- The limited number of suggestions for the majority of free keywords indicates the weakness of non-experts to annotate cultural heritage data

- 
- ✓ Introduction
 - ✓ Proposed Method
 - ✓ Evaluating Annotators Consistency
 - ✓ Results and Discussion
 - ★ Conclusions and Further work

Conclusions and Further work (2)



- Future work includes:
 - The investigation of more measurements:
 - Total number of keywords that are out of content submitted by each annotator
 - Total number of keywords that are out of content submitted for each image
 - The database schema will be expanded to store more information like:
 - Date of suggested keyword for specific image
 - Time of suggested keyword for specific image



Thank You