The Cross Language Image Retrieval Track: ImageCLEF 2008

Thomas Deselaers[1], Henning Müller[2], Thomas Arni[3], Theodora Tsikrika[4], Jayashree Kalpathy-Cramer[5], Mark Sanderson[3], Paul Clough[3], Jana Kludas[6], Allan Hanbury[7], Michael Grubinger[8], Thomas M. Deserno[9], Bill Hersh[5]

[1]RWTH Aachen University, Computer Science Dep. Germany
[2]University and Hospitals of Geneva, Switzerland
[3]Sheffield University, UK
[4]CWI, The Netherlands
[5]Oregon Health Science University
[6]University of Geneva, Switzerland
[7]Vienna University, Austria
[8]Victoria University, Australia
[9]RWTH Aachen University, Medical Informatics, Germany

ImageCLEF 2008

- General overview
  - Participation
  - Problems
- Photo retrieval task
- Medical image retrieval task
- WikipediaMM Task
- Visual Concept Detection Task
- Medical image annotation
- Conclusions

General participation and news

- **Total: 63 groups registered**
- Photo Retrieval: 24 groups, 1042 runs
- Medical Retrieval: 15 groups, 111 runs
- WikipediaMM Retrieval: 12 groups, 77 runs
- Visual Concept Detection: 11 groups, 53 runs
- Medical Image Annotation: 6 groups, 24 runs

News:

- WikipediaMM task
- visual concept detection task
- diversity-based ranking for photo retrieval

Photo : Goals / Task

Goals :

- Address the growing need for diversity
- Allows to measure diversity
- Make participation straightforward
- Attract both conceptual and visual teams

Task :

- Promote Diversity
- Top 20 results should contain:
  - Maximum number of relevant images
  - Relevant images from as many different clusters as possible

Participation

2008
- **24 groups**
- **1042 runs**

2007
- 20 groups
- 616 runs

2006
- 12 groups
- 157 runs

2005
- 11 groups
- 349 runs

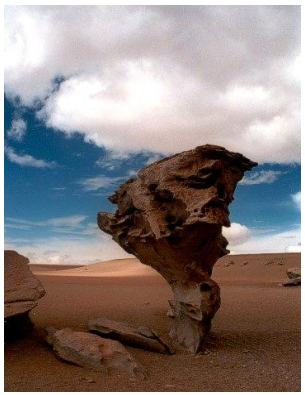
- **AVEIR** - Joint project of the four French labs : LIG,LIP6, LSIS, PTECH- *4 runs*
- **Budapest-ACAD** - Computer and Automation Research Institute, Hungarian Academy of Sciences, Budapest, Hungary - *8 runs*
- **CLAC** -Computational Linguistics at Concordia (ClaC) Lab, Concordia University, Montreal, Canada – *6 runs*
- **CUT**- Chemnitz University of Technology, Chemnitz, Germany – *4 runs*
- **DCU** - School of Computing, Dublin City University, Dublin Ireland – *733 runs*
- **GITS** - KAMEYAMA Lab,GITS, Waseda University, Japan – *4 runs*
- **INAOE** - National Institute of Astrophysics, Optics and Electronics, Computer Science Department, Puebla, Mexico – *16 runs*
- **IPAL** - Image Perception, Access & Language (IPAL), Singapore & National Center for Scientific Research, France & Institute for Infocomm Research, Singapore & University of Joseph Fourier, Grenoble, France – *10 runs*
- **LIG** - Laboratory of Informatics of Grenoble (LIG), Grenoble, France – *4 runs*
- **LSIS** - System and Information Sciences Lab, France – *15 runs*
- **Meiji** - Department of Computer Science, Meiji University, Japan – *8 runs*
- **MirFI** - Computer Science Faculty, Daedalus, Madrid, Spain – *41 runs*
- **MirGSI** - Intelligent System Group, Daedalus, Madrid, Spain - *14 runs*
- **MMIS** - Imperial College London & Open University, UK – *9 runs*
- **NII** - National Institute of Informatics, Tokyo, Japan – *10 runs*
- **NTU** - National Taiwan University, Taipei, Taiwan – *7 runs*
- **Ottawa** - School of Information Technology and Engineering, University of Ottawa, Canada - *13 runs*
- **PTECH** - Institut TELECOM, TELECOM ParisTech, Paris, France – *15 runs*
- **Shef** - Department of Information Studies, University of Sheffield, Sheffield, UK – *37 runs*
- **SINAI** - Sinai group of the University of Jaén, Jaén, Spain – *6 runs*
- **TEXMESS** - Department of Software and Computing Systems, University of Alicante, Spain &
- University of Jaén, Jaén, Spain – *17 runs*
- **UA-GPLSI** - Department of Software and Computing Systems, University of Alicante, Spain – *18 runs*
- **UPMC** - Pierre & Marie Curie University, Paris, France -
- **XRCE** - Xerox Research Centre Europe - *28 runs*

Collection : IAPR TC-12 Benchmark

- 20,000 colour photographs
- Accompanied by semi-structured captions
  - English and Random
- Many images have similar visual content but varying
  - illumination
  - viewing angle
  - background
- Used in ImageCLEF in 2006, 2007






Images and Captions

<DOC>
<DOCNO>annotations/17/17405.eng</DOCNO>
<TITLE>Group photo with Machu Picchu and Huayna Picchu in the background</TITLE>
<DESCRIPTION>tourists are sitting on a grey gravel road in the foreground;
a ruin with grey walls and many green terraces and a distinctive, rocky, steep mountain behind it;
a wooden mountain range and white clouds in the background; </DESCRIPTION>
<NOTES></NOTES>
<LOCATION>Machu Picchu, Peru</LOCATION>
<DATE>26 October 2004</DATE>
<IMAGE>images/17/17405.jpg</IMAGE>
<THUMBNAIL>thumbnails/17/17405.jpg</THUMBNAIL>
</DOC>

Topics

- 39 topics with full information
  - Based on realistic topics (log-file analysis and interviews)
- Available in English only
- Augmented by a cluster tag
  - defines how the rel. images should be clustered

```
<top>
<num> Number: 5 </num>
<title> animal swimming </title>
<cluster> animal </cluster>
<narr> Relevant images will show one or more
animals (fish, birds, reptiles, etc.)
swimming in a body of water. Images of
people swimming in water are not relevant.
Images of animals that are not swimming are
not not relevant. </narr>
<image> SampleImages/05/3739.jpg </image>
<image> SampleImages/05/4986.jpg </image>
<image> SampleImages/05/30823.jpg </image>
</top>
```

Sample topic images:



Participation

Dimensions	Type	2008		2007		2006	
		Runs	Groups	Runs	Groups	Runs	Groups
Annotation language	EN	514	24	271	17	137	2
	RND	495	2	32	2		
Modality	Text Only	404	22	167	15	121	2
	Mixed (text and image)	605	19	255	13	21	1
	Image Only	33	11	52	12		
Run type	Manual	3	1	19	3		
	Automatic	1039	25	455	19	142	2

Metrics

S-Recall = Subtopic-Recall = Cluster Recall

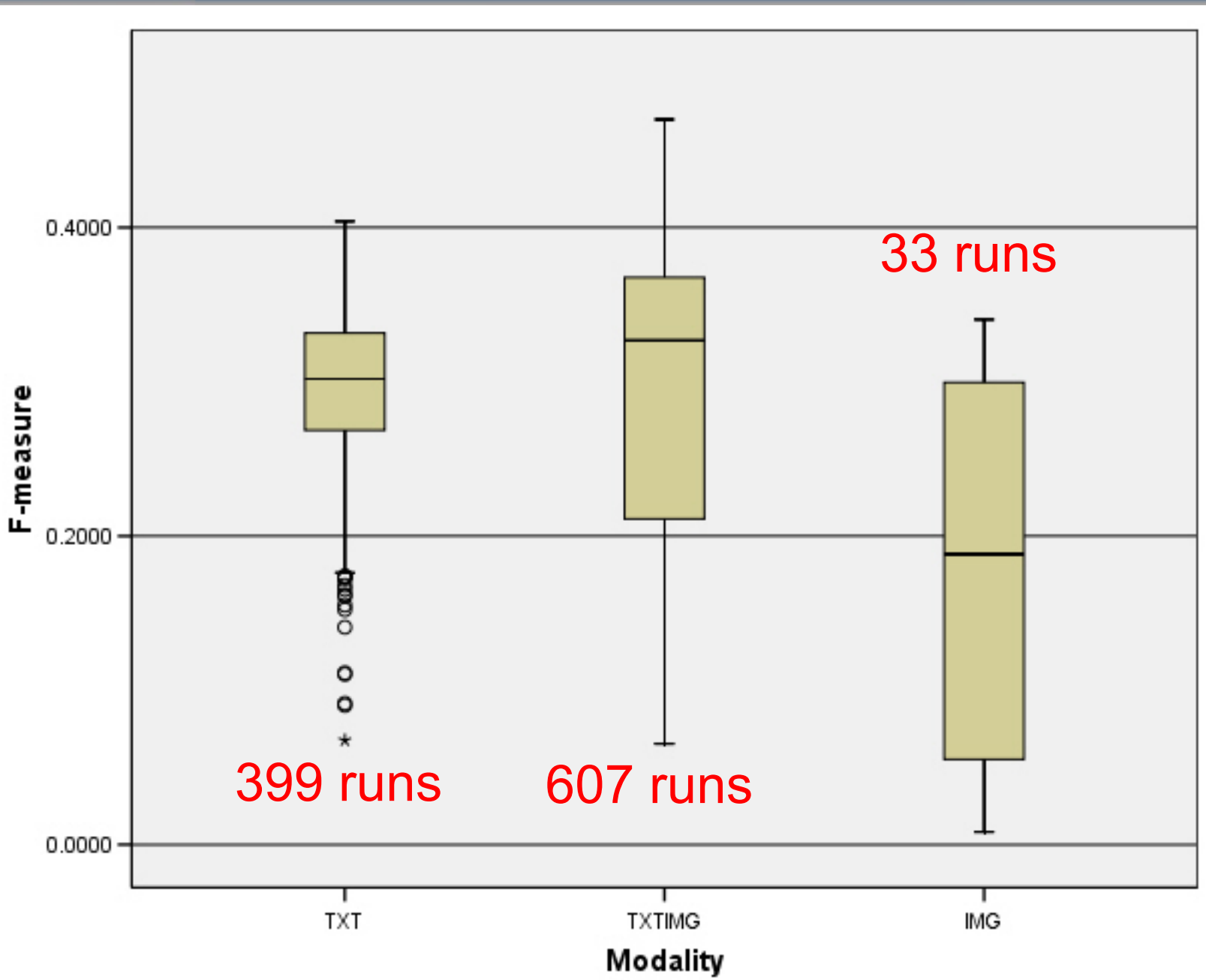
S-Recall at rank K= $\frac{\left|\cup_{i=i}^{K} subtopics(d_i)\right|}{n_A}$

Cluster Recall at Rank 20 = CR20

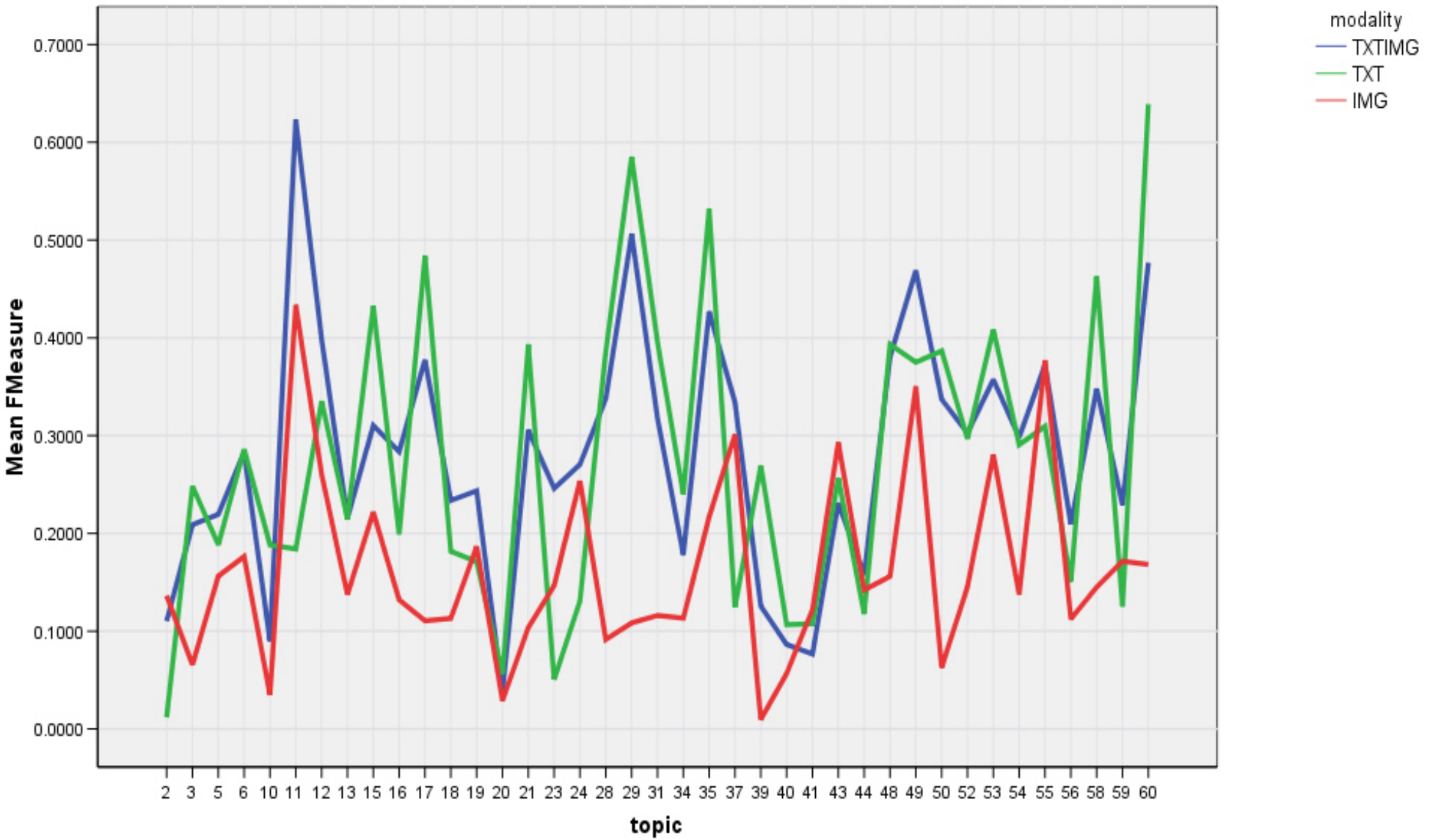
F-Measure = $\frac{\left|2 \times (P20 \times CR20)\right|}{(P20 + CR20)}$

Harmonic mean

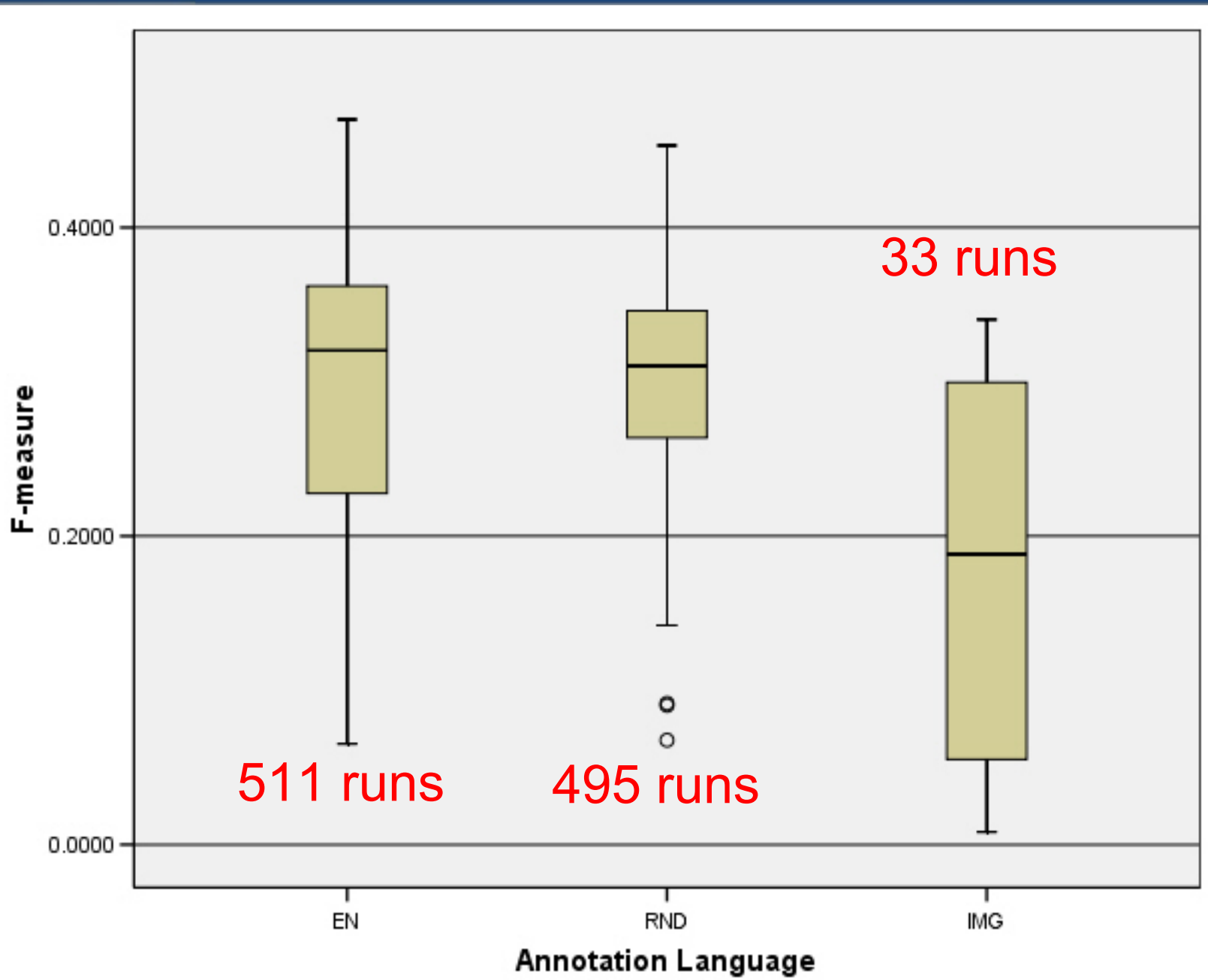
Results : Modality Overview



Results : Modality Overview



Results : Annotation Language



Conclusions and Findings

- Choice of annotation language is almost negligible
- Combining concept and content-based retrieval methods can improve retrieval performance
- Purely visual runs performed poorly
- More participants than ever used visual retrieval techniques
- Record number of participants

Medical retrieval 2008

- New data set with almost 66,000 images
- Thirty topics were made available, ten in each of three categories: visual, mixed, and semantic
- 15 groups submitted 111 official runs
- Relevance judgments paid by NSF grant

Database used

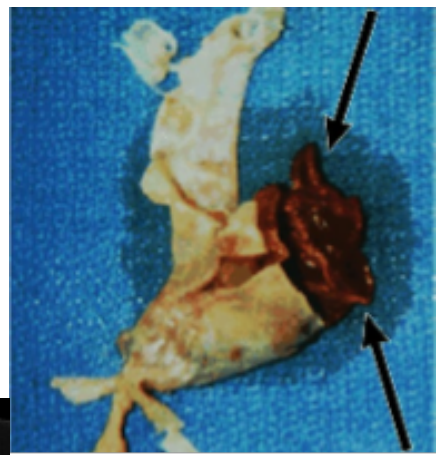
- Subset of Goldminer collection (Radiology and Radiographics)
  - images
  - figure captions
  - access to the full text articles in HTML
  - Medline PMID (PubMed Identifier).
- Well annotated collection, entirely in English
- Topics were supplied in German, French, and English

Example topics

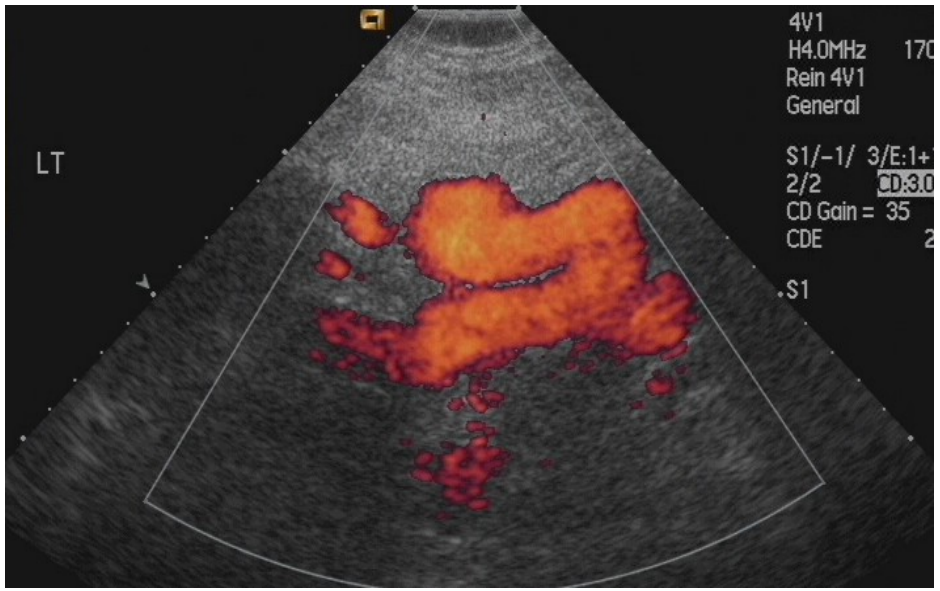
The topics used in 2008 were a subset of the 85 topics used in 2005-2007.

Pulmonary embolism all modalities.
Lungenembolie alle Modalitäten.

Embolie pulmonaire, toutes les formes.



Show me Doppler ultrasound images (colored).



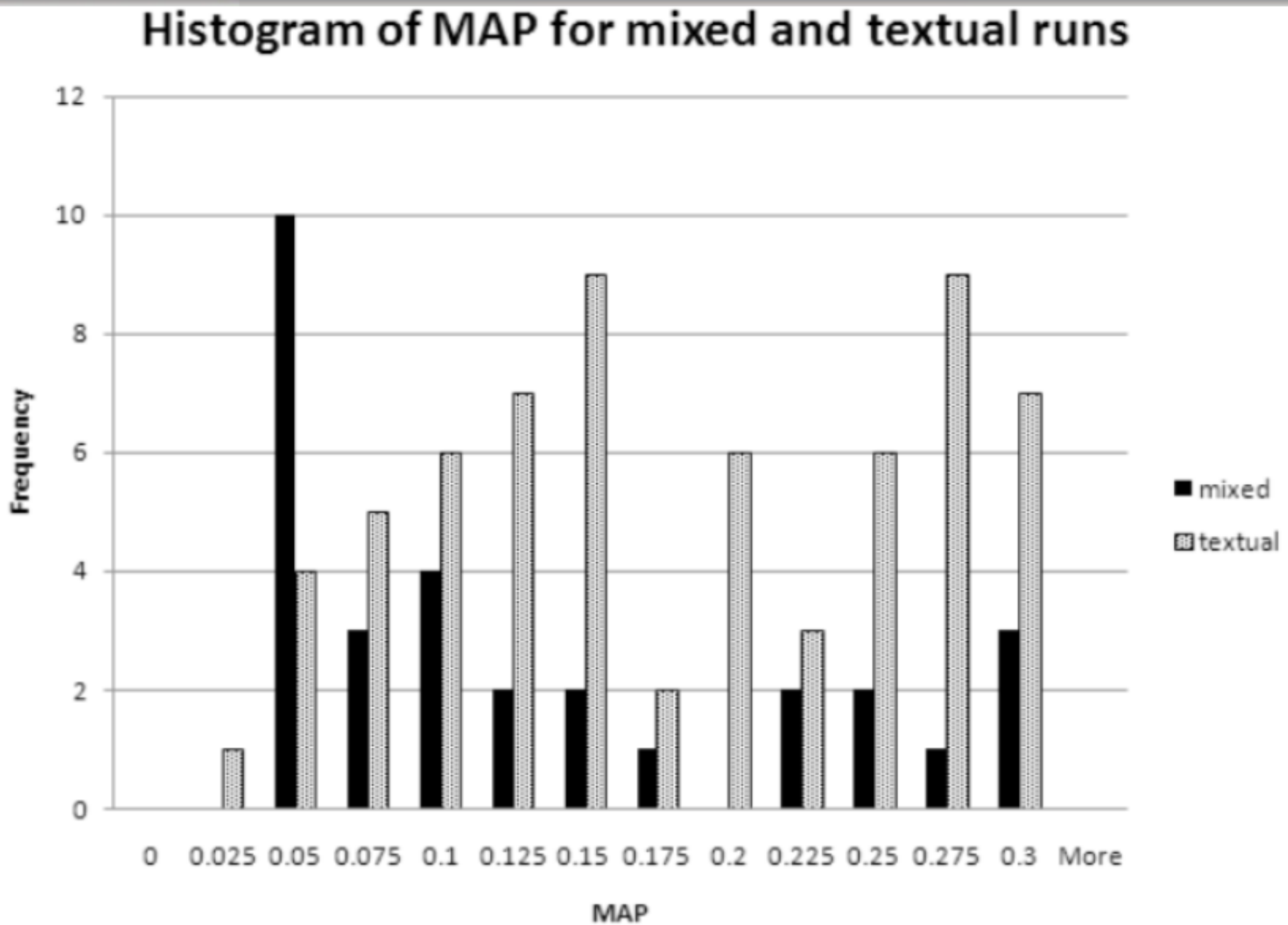
Participants in 2008

- Hungarian Academy of Sciences, Budapest, Hungary
- National Library of Medicine (NLM), National Institutes of Health NIH, Bethesda, MD, USA
- Bania Luka University, Bosnia-Hercegovina;
- MedGIFT group, University of Geneva, Switzerland
- Natural Language Processing group, University Hospitals of Geneva, CH
- GPLSI group, University of Alicante, Spain
- Multimedia Modelling Group, LIG, Grenoble, France
- Natural Language Processing at UNED. Madrid, Spain
- Miracle group, Spain
- Oregon Health and Science University (OHSU), Portland, OR, USA
- IRIT Toulouse, France
- University of Jaen, Spain
- Tel Aviv University, Israel
- National University of Bogota, Colombia
- TextMess group, University of Alicante, Spain

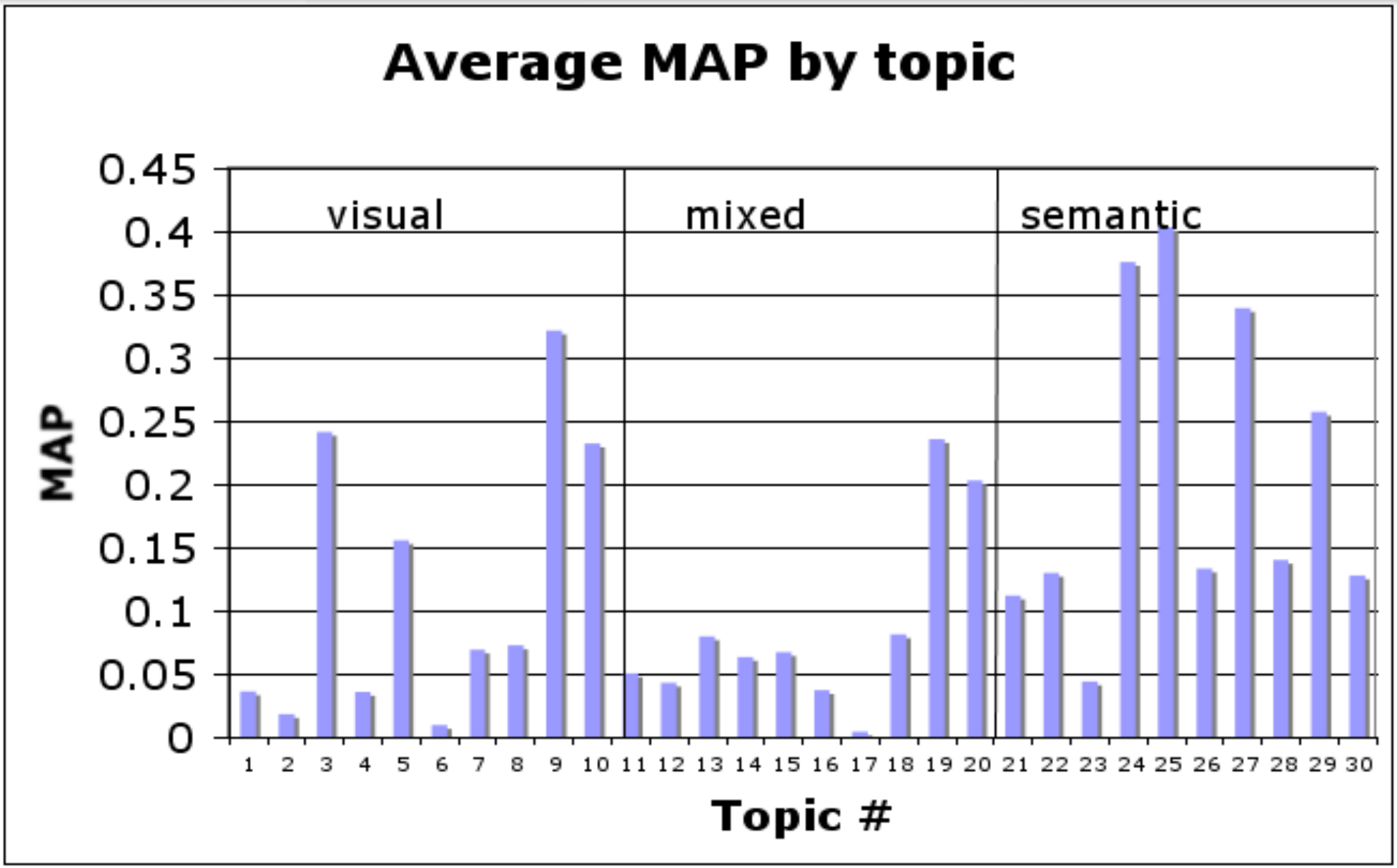
Runs submitted by category

	Visual	Textual	Mixed
Automatic	8	**65**	31
Interactive	0	0	3
Manual	0	2	2

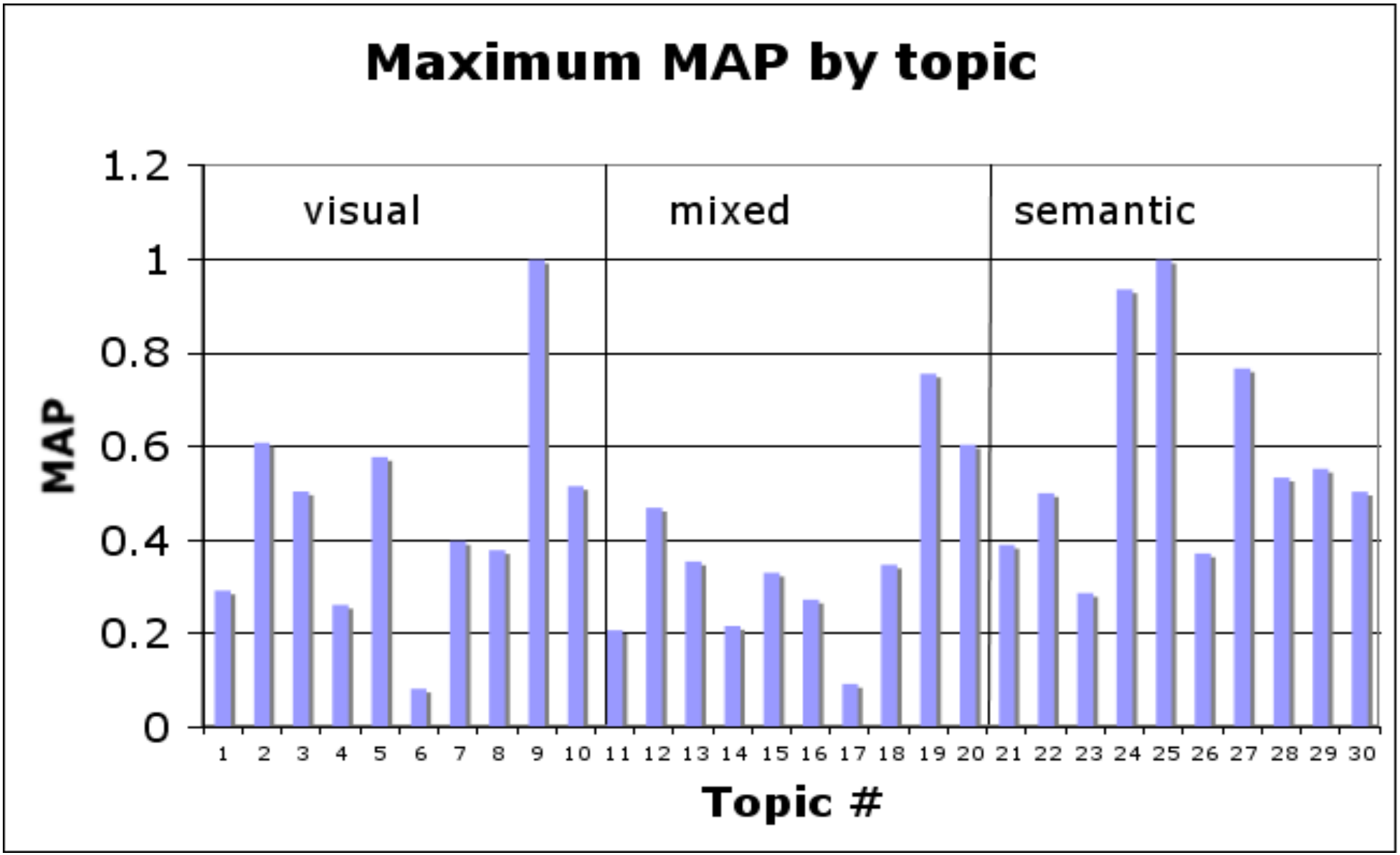
MAP Histogram



Topic Analysis



Topic Analysis



Inter observer reliability

- Four topics were each judged by two judges
- Kappa measurements

Topic	Judge 1	Judge 2	Strict kappa	Lenient Kappa
3	User 3	User 4	0.91	0.95
5	User 5	User 7	0.7	0.79
6	User 3	User 5	0.48	0.48
25	User 7	User 10	0.69	0.7

Conclusions

- Focus for this year was text-based retrieval
  - Almost twice as many text-based runs compared to multi-media runs
  - Most groups performed better on the semantic topics than visual or mixed topics
  - As in 2007, purely textual retrieval had the best overall run
    - Mixed runs performed worse than corresponding textual run
  - Purely visual runs performed poorly
  - Combining text with visual retrieval can improve early precision
    - Combinations can be fragile
  - Semantic topics combined with a database containing high quality annotations in 2008
    - less impact of using visual techniques as compared to previous years.

Plans/Hopes for ImageCLEF2009

- Our goal in the upcoming ImageCLEF medical retrieval task is to increase the number of visual runs or mixed submitted.
  - Modify the task to favor more integrated approaches.
- Interactive retrieval has always had poor participation
    - Relevance feedback and query modification have a potential to significantly improve results
- Transition to more “find similar case”
  - Same database?
  - Database with annotations for regions of interest?

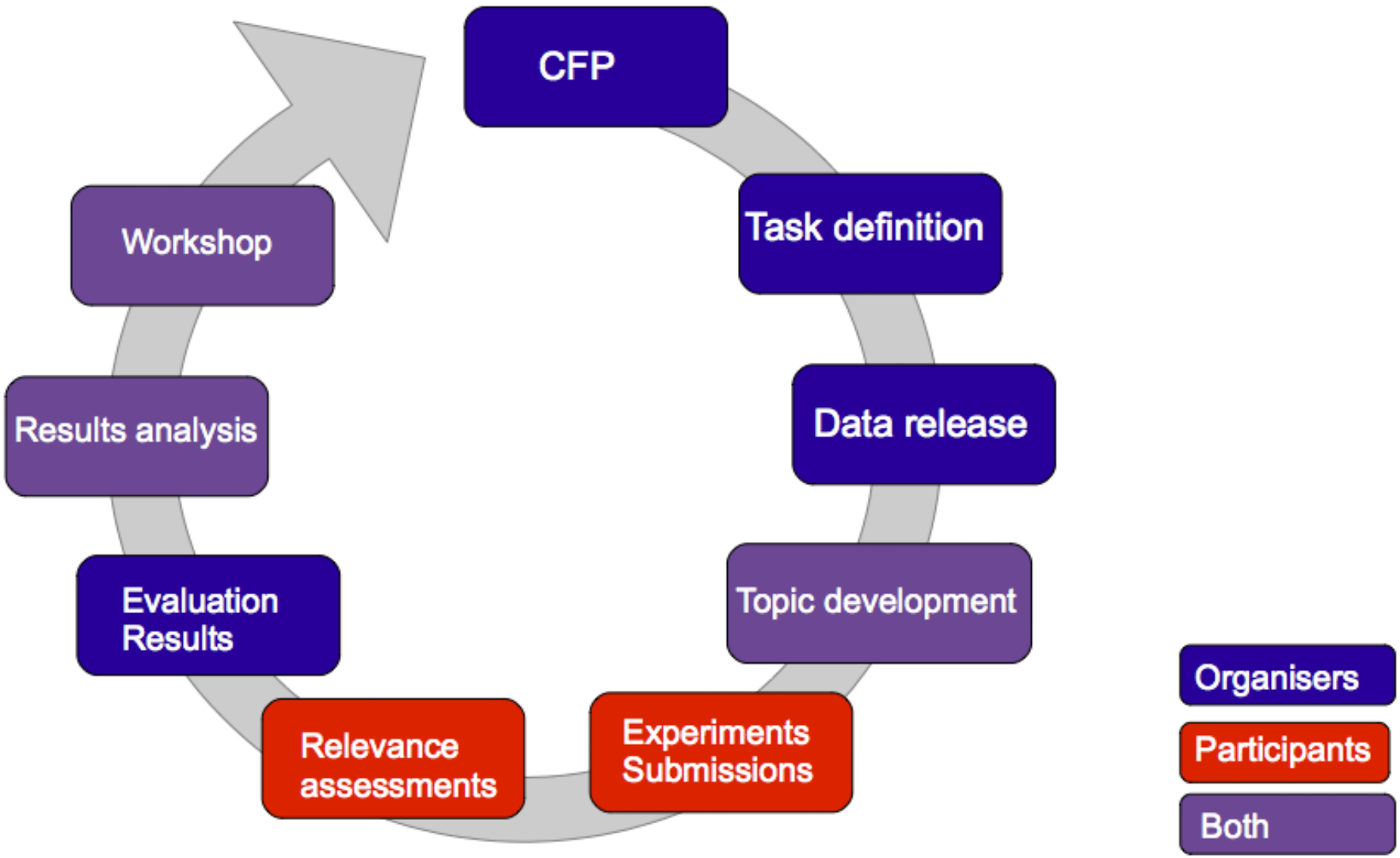
wikipediaMM: Task

- **History:**
  - 2008 wikipediaMM task @ ImageCLEF
  - 2007 MM track @ INEX
  - 2006 MM track @ INEX

- **Description:**
  - ad-hoc image retrieval
  - collection of Wikipedia images
    - large-scale
    - heterogeneous
    - user-generated annotations
    - availability of multi-lingual data
  - diverse multimedia information needs

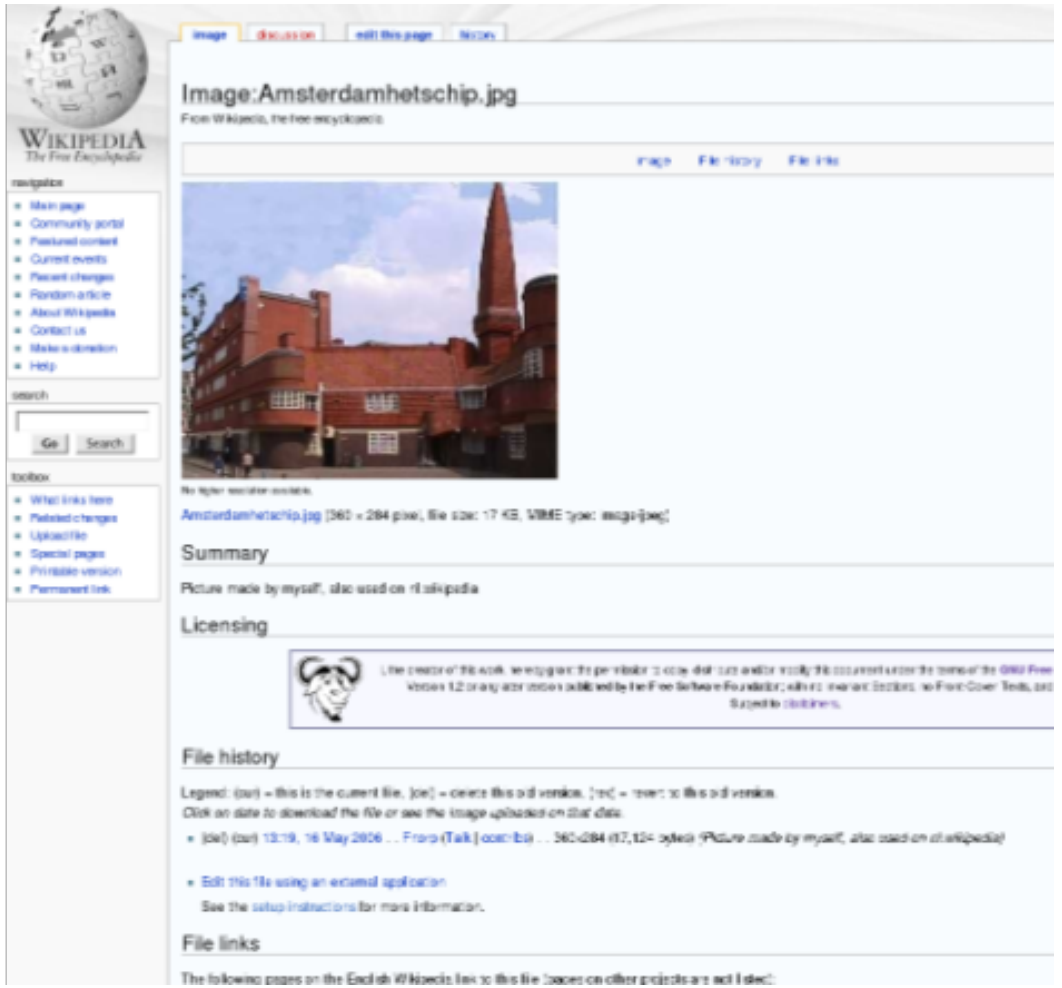
- **Aim**:
  - investigate mono-media and cross-media retrieval approaches
    - focus on fusion/combination of evidence from different modalities
  - attract researchers from both text and visual retrieval communities
  - support participation through provision of appropriate resources

wikipediaMM: Yearly cycle



wikipediaMM: Collection

- 151,590 images
  - wide variety
  - global scope
  - JPEG, PNG formats
- Annotations
  - user-generated
    - highly heterogeneous
    - varying length
    - noisy
  - semi-structured
  - monolingual (English)
- Used in INEX MM 2006 - 2007



wikipediaMM: Additional resources

- provided by University of Amsterdam
- 101 MediaMill concepts
- classifiers trained on TRECVID 2005 data

Features

- Natural Image statistics:
  - 0.486683, 0.453243, 0.421476, 0.371388, 0.279351, 0.410819, 0.321526, 0.461151, 0.391605, 0.360453, 0.086648, 0.271732, 0.231170, 0.334546, 0.270454, 0.577713, 0.529623, 0.501511, 0.482971, 0.355653, 0.544112, 0.392626, 0.562681, 0.463030, 0.438386, 0.101318, 0.335869, 0.275694, 0.456026, 0.335002, 0.354639, 0.308430, 0.279414, 0.278727, 0.268225, 0.325531, 0.237821, 0.308108, 0.317694, 0.294898, 0.106288, 0.266600, 0.231708, 0.296142, 0.263102, 0.642913, 0.622363, 0.624570, 0.536831, 0.629639, 0.624990, 0.456589, 0.646821, ...

Concepts

- ...
- Boat: 0.12
- Building: 0.84
- Bus: 0.08
- Bush: 0.01
- ....

wikipediaMM: Topics

<topic>

<number> 62 </number>

<title> cities by night </title>
<concept> building </concept>
<image> http://www.bushland.de/hksky2.jpg </image>

<narrative> I am decorating my flat and as I like photos of cities at night, I would like to find some that I could possibly print into posters. Photos of cities (or the earth) from space are not relevant. I would like to find photos of skylines or photos that contain parts of a city at night (including streets and buildings). </narrative>

</topic>

Number of topics	75
Average number of terms in title	2.64
Number of topics with image(s)	43
Number of topics with concept(s)	45
Number of topics with both image and concept	28
Number of topics with text only	15

wikipediaMM: Participation

(topic development, submissions, assessments)

2008
- **12 groups**
- **77 runs**

2007 (INEX MM)
- 4 groups
- 12 runs

2006 (INEX MM)
- 4 groups
- 16 runs

	TD	S	A
CEA - CEA LIST, France			
CHEMNITZ - Computer Science and Media, Chemnitz University of Technology			
CURIEN - Laboratoire Hubert Curien, Universite Jean Monnet, Saint-Etienne, France			
CWI - Database Architectures and Information Access, CWI, Netherlands			
IMPERIAL - Multimedia and Information Systems, Imperial College, UK			
IRIT - SIG-IRIT, Toulouse, France			
STZAKI - Data Mining and Web Search, Hungarian Academy of Sciences			
UALICANTE - NLP and Information Systems, University of Alicante, Spain			
UNIGE - Computer Vision and Multimedia, Universite de Geneve, Switzerland			
UPEKING - Digital Media Institute, Peking University, China			
UPMC-LUP6 - UPMC/LIP6 - Computer Science Lab, Paris, France			
UTOULON - LSIS, UMR CNRS & Universite Sud Toulon-Var, France			
CLAC - Computational Linguistics, Concordia University, Montreal, Canada			
DEU - Dept. Comp. Engineering, Dokuz Eylul Univeresity, Turkey			
XRCE - Xerox Research Centre Europe			

wikipediaMM: Assessment system

topic

assessment

Query 62

Back Help Topic First

cities by night

Judged:1751/1751

prev 20

51771
52486
52692
52762
52978
53174
53752
53823
54074
54253
54344
54677
54809
55076
55102
55532
55743
55815
55926

next 20

pool

current image

Save topic comments

Not relevant
Relevant

NEXT

Save topic/image comments

This is document *55926* from the **ImageCLEF wikipediaMM** Corpus.
Note: It is a snapshot of a wikipedia page as we crawled the web; the current page may have changed since that time. Assessments are to be made on the crawled page as shown below.

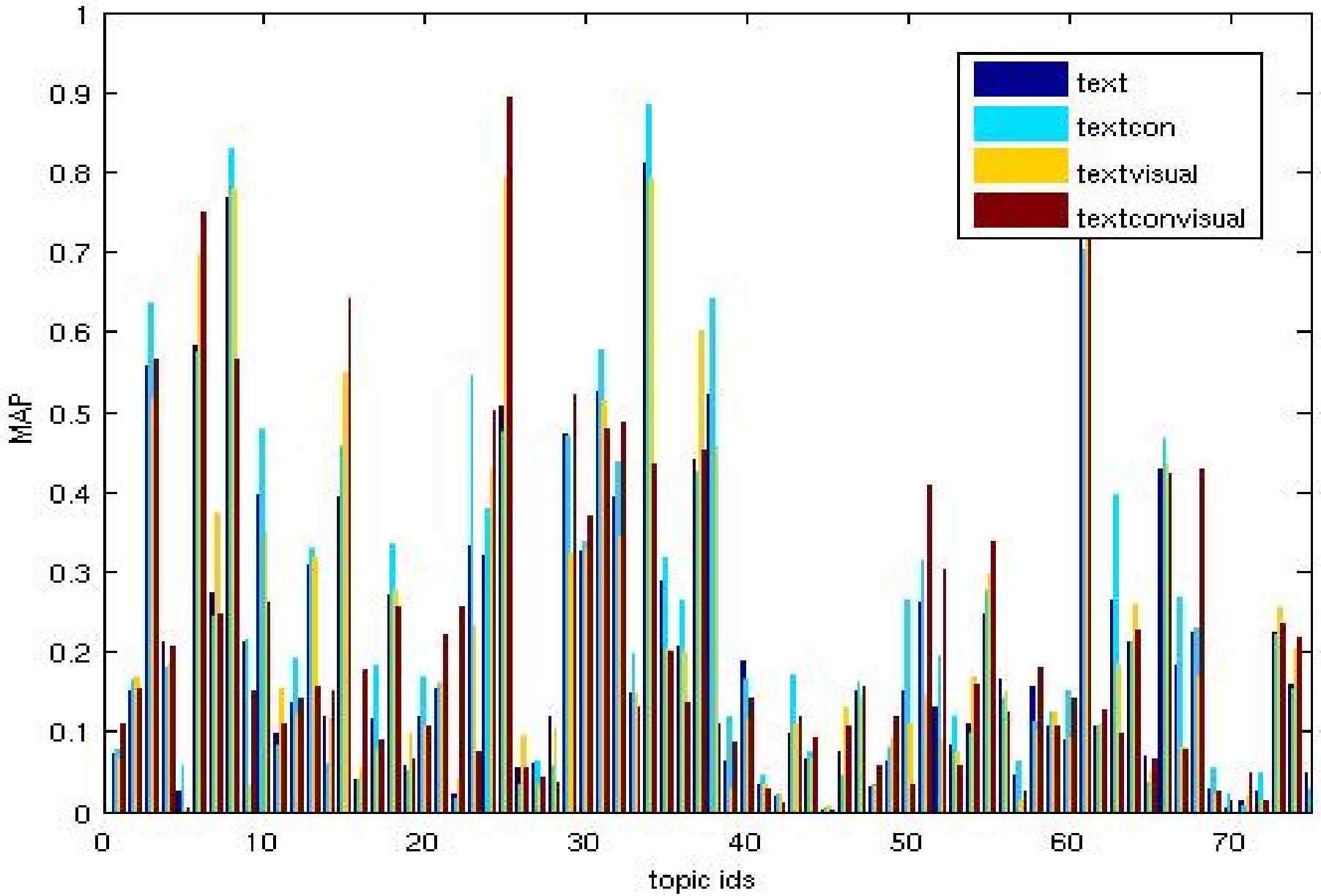
55926: Hamburg1.jpg

Hamburg1.jpg

wikipediaMM: Results

		best run						average runs			
Group	# runs	rank	Modality	FB/QE	MAP	P@20	R-prec.	rank	MAP	P@20	R-prec.
upeking	7	1	TXT	QE	0.3444	0.3993	0.3794	37.5	0.1749	0.2020	0.1922
cea	2	2	TXTCON	QE	0.2735	0.3840	0.3225	3.0	0.2684	0.3757	0.3153
ualicante	24	3	TXT	NOFB	0.2700	0.3040	0.3075	22.5	0.2349	0.2797	0.2271
sztaki	8	10	TXT	NOFB	0.2551	0.2773	0.3020	15.5	0.2508	0.2777	0.2954
cwi	2	13	TXT	NOFB	0.2528	0.2833	0.3080	16.0	0.2511	0.2810	0.3023
curien	6	22	TXT	NOFB	0.2453	0.2860	0.2905	45.5	0.1515	0.1940	0.1822
chemnitz	4	27	TXTIMGCON	QE	0.2195	0.2747	0.2734	32.5	0.2122	0.2770	0.2643
imperial	6	44	TXT	NOFB	0.1918	0.2647	0.2362	59.5	0.0978	0.1384	0.1235
irit	4	48	TXT	NOFB	0.1652	0.2353	0.2148	57.5	0.1198	0.1783	0.1647
ugeneva	2	52	TXT	NOFB	0.1440	0.1793	0.1806	58.0	0.1179	0.1660	0.1574
upmc-lip6	7	56	TXT	NOFB	0.1193	0.1820	0.1581	66.5	0.0602	0.0947	0.0817
utoulon	5	70	TXT	NOFB	0.0399	0.0673	0.0583	70.0	0.0399	0.0353	0.0583

wikipediaMM: Results (cross-media)



wikipediaMM: Conclusions

- **Findings:**
  - text-only approaches perform quite well
    - query expansion (knowledge bases)
    - relevance feedback
    - weighting schemes (BM25, DFR, LM)
  - **BUT** fusion with concepts can be beneficial
  - different types of topics benefit from different approaches

- **Open issues:**
  - effective combination of text and visual evidence?
  - cross-media relevance feedback?

- **Next year**??
  - multilinguality (topics? annotations?)
  - which concepts? ground truth?
  - what resources to provide to participants?
  - user participation in topic development/relevance assessments?

Visual Concept Detection Task

2006: object annotation
2007: object retrieval
2008: visual concept detection


indoor


outdoor


person

day


night


water


road or pathway


vegetation

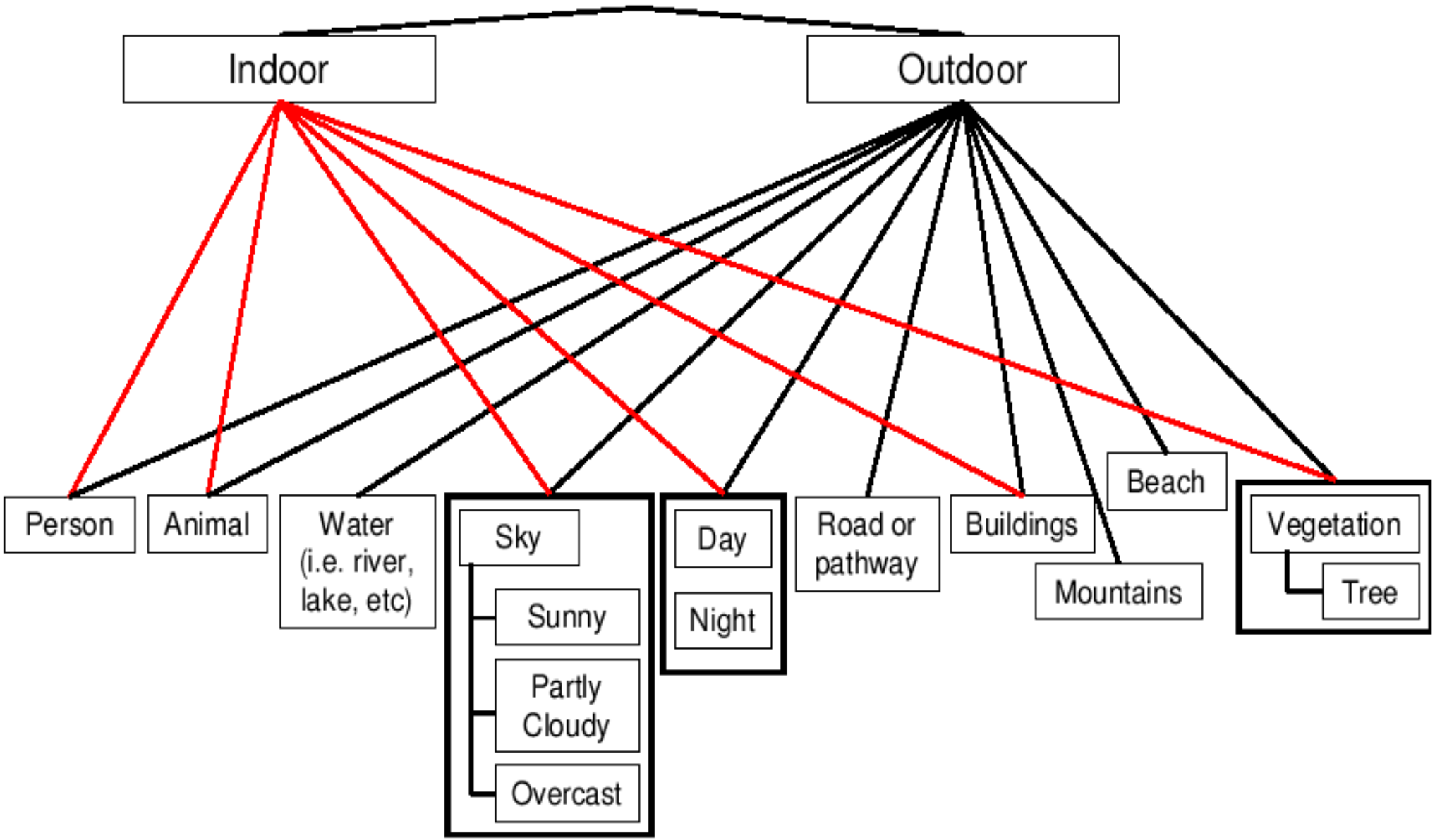

tree


mountains


beach


buildings

Visual Concept Detection Task



VCDT: Participants

- **CEA-LIST**, France
- **MSR China**, Multimedia Computing and Communications, China
- **IPAL-I2R**, Infocomm Research Lab, Singapore
- **LSIS**, Information Sciences and Systems, France
- **MMIS**, Open University, UK
- **Makere,** Faculty of Computing and Information Technoloy, Makere University, Uganda
- **RWTH**, Human Language Technology and Pattern Recognition Group, Aachen, Germany
- **TIA**, Group for Machine Learning for Image Processing and Information Retrieval, Mexico
- **UPMC**, University Pierre et Marie Curie, Paris
- **XRCE**, Xerox Research Centre Europe, Grenoble, France
- **SZTAKI,** Hungaran Academy of Science, Budapest, Hungary

VCDT: Results

		best run			AVG		
	# runs	rank	EER	AUC	rank	EER	AUC
XRCE	2	1	16.65	90.66	1.5	17.97	89.7
RWTH	1	3	20.45	86.19	3	20.45	86.19
UPMC	6	4	24.55	82.74	11	27.2	65.23
LSIS	7	5	25.88	80.51	20.29	32.8	71.79
MMIS	4	13	28.44	77.94	23.25	32.55	72.95
CEA_LIST	3	17	29.04	73.4	26.33	33.39	59.7
IPAL_I2R	8	19	29.71	76.44	32.13	35.96	68.29
budapest	13	20	31.14	74.9	31.77	35.17	68.59
TIA	7	24	32.09	55.64	39.57	39.87	36.26
HJ_FA	1	47	45.07	19.96	47	45.07	19.96
Makere	1	51	49.25	30.83	51	49.25	30.83

VCDT: Results

		best			average		worst	
#	concept	EER	AUC	group	EER	AUC	EER	AUC
0	indoor	8.9	97.4	XRCE	28	67.6	46.8	2
1	outdoor	9.2	96.6	XRCE	30.6	70.5	54.6	13.3
2	person	17.8	89.7	XRCE	35.9	62.2	53	0.4
3	day	21	85.7	XRCE	35.4	64.9	52.5	9.7
4	night	8.7	97.4	XRCE/budapest	27.6	72.5	73.3	0
5	water	23.8	84.6	XRCE	38.1	57.8	53	3.2
6	road/pathway	28.8	80	XRCE	42.6	50.7	56.8	0
7	vegetation	17.6	89.9	XRCE	33.9	67.4	49.7	30.7
8	tree	18.9	88.3	XRCE	36.1	62.8	59.5	1
9	mountains	15.3	93.8	XRCE	33.1	61.2	55.8	0
10	beach	21.7	86.8	XRCE	35.8	57.6	51.4	0
11	buildings	17	89.7	XRCE	37.4	60.8	64	0.5
12	sky	10.4	95.7	XRCE	24	78.6	50.8	37.3
13	sunny	9.2	96.4	XRCE	30.3	66.5	55.4	0
14	partly cloudy	15.4	92.1	XRCE/budapest	37.5	58.9	55.5	0
15	overcast	14.1	93.7	XRCE	32.1	67.6	61.5	0
16	animal	20.7	85.7	XRCE	38.2	54.2	58.4	0

VCDT: Conclusions

- visual concept detection works quite well
- some concepts are far easier than others
  - water & road are very hard
  - sunny, night, indoor/outdoor is easy
- local features and discriminative classifiers outperform other methods

- only one group used VCDT outcome for photo retrieval
  - improvements are consistent

Open Questions:

- which concepts? which training data?
- how to combine/fuse VCDT and photo retrieval!

Medical Image Annotation Task

- Purely visual task
- Given an image, find a textual description
- 2005:
  - 9,000 training images/1,000 test images
  - Assign one out of 57 possible labels to each image
- 2006:
  - 10,000 training images/1,000 test images
  - Assign one out of 116 possible labels to each image
- 2007:
  - 11,000 training images/1,000 test images
  - Assign a textual label to each image (one out of 116)
- 2008:
  - 12,076 training images/1,000 test images
  - more classes, use of hierarchy required (~200 classes)

Example of IRMA code

- Example: `1121-127-720-500`
  `DDDD-AAA-BBB-TTT`

D Direction:

coronal, anterior-posterior, supine

A Anatomy:

abdomen, middle, unspec.

B Biosystem:

uropoetic system, unspec., unspec.

T Technique:

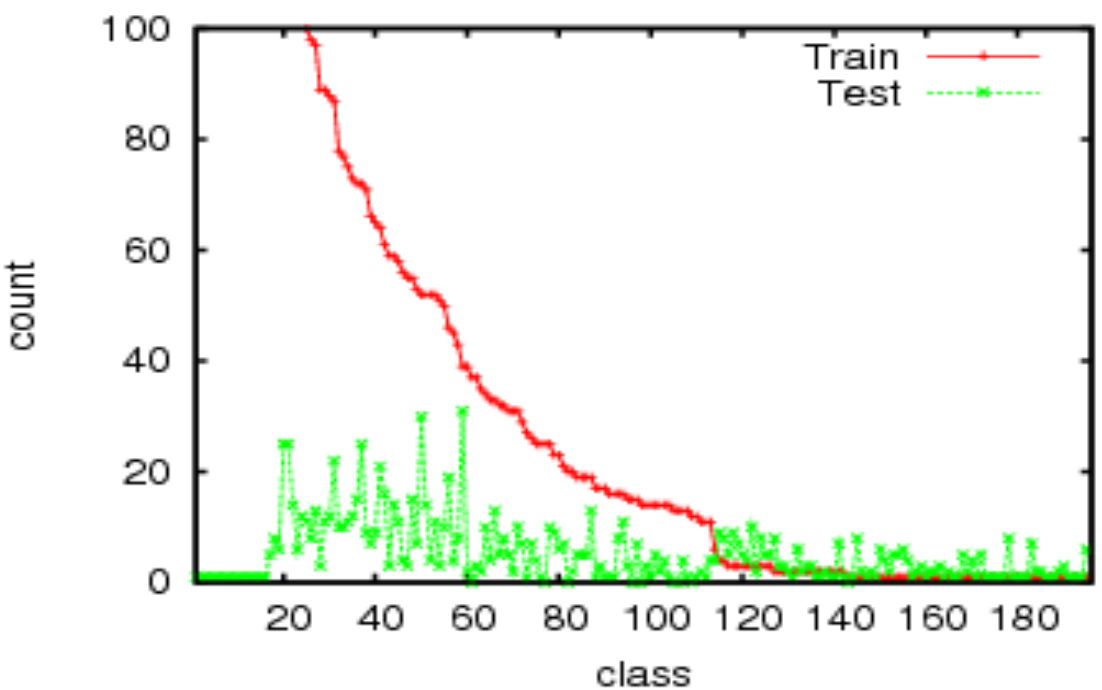
radiography, plain, analog, overview

Aim: Predict complete code

- as far as possible
- correctly

Evaluation Criterion

- incomplete codes 11__-12_-7__-5__
- not predicting a position: better than a wrong prediction
- incorrect prediction in one position invalidates all later predictions in this axis
- axes are independent
- early errors are worse than late



Examples

(for one axis): correct 318a

318a	0
318*	0.06
3187	0.12
31**	0.14
32**	0.52
8988	1.00

Example Images

12,076 train images

1,000 test images

196 unique codes

1121-120-200-700

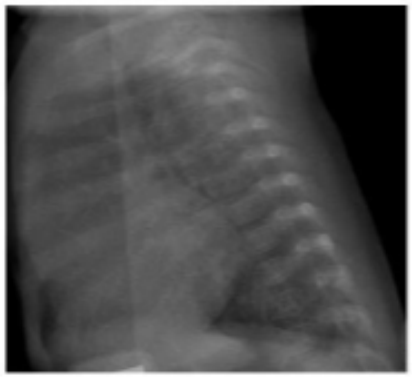
T: x-ray, plain radiography, analog, overview image
D: coronal, anteroposterior (AP, coronal), unspecified
A: cranium, unspecified, unspecified
B: musculosceletal system, unspecified, unspecified

1121-120-310-700

T: x-ray, plain radiography, analog, overview image
D: coronal, anteroposterior (AP, coronal), unspecified
A: spine, cervical spine, unspecified
B: musculosceletal system, unspecified, unspecified

1121-127-700-500

T: x-ray, plain radiography, analog, overview image
D: coronal, anteroposterior (AP, coronal), supine
A: abdomen, unspecified, unspecified
B: uropoietic system, unspecified, unspecified



1123-211-500-000

T: x-ray, plain radiography, analog, high beam energy
D: sagittal, lateral, right-left, inspiration
A: chest, unspecified, unspecified
B: unspecified, unspecified, unspecified

Participants

- **FEIT -** Faculty of Electrical Engineering and Information Technology, Skopje, Macedonia
- **medGIFT -** University Hospitals of Geneva, Switzerland
- **Miracle -** Miracle Lab, Daedalus University, Madrid, Spain
- **TAU -** Medical Image Processing Lab, Tel Aviv University, Israel
- **IDIAP -** IDIAP research institute, Martigny, Switzerland
- **IRMA** - Medical Informatics, RWTH Aachen University, Aachen, Germany

Results

		best			average		
	# runs	rank	score	wild cards	rank	score	wild cards
IDIAP	9	1	74.92	4148	8.33	132.33	4022
TAU	4	7	105.75	1000	8.5	109.54	1967
IRMA	1	12	182.77	0	12	182.77	0
MIRACLE	4	13	187.9	4426	14.5	190.73	3671.25
medGIFT	4	17	210.93	2146	19	230.34	1653
FEIT	2	22	286.48	1117	22.5	288.49	1070.5

Conclusion/Findings:

- machine learning techniques from IDIAP work best
- local features outperform global ones
- use of wildcards necessary for good results
- results of last year published in PRL SI

Highlights of ImageCLEF 2008

- large number of participants in ImageCLEF
- good registration/participation ratio in photo retrieval
- new Wikipedia MM task
- Quaero sponsored pre workshop

ImageCLEF 2008 Parallel Session

Thursday 14:30

Visual Concept Detection Task

Gabriella Csurka, Xerox Research Center Europe, France
Image Fisher Vector based visual concepts detection and image retrieval

Photo Retrieval

Gareth Jones, Dublin City University, Ireland
DCU at ImageCLEFPhoto 2008

WikipediaMM Retrieval

Adrian Popescu, CEA-LIST, France
Conceptual image retrieval over the Wikipedia corpus

Medical Image Annotation

Tatiana Tommasi, IDIAP, Switzerland
CLEF2008 Image Annotation Task: an SVM Confidence-Based Approach

Medical Retrieval

Manuel Carlos Díaz Galiano, SINAI, U Jaen, Spain
SINAI at ImageCLEFmed

Breakout Session/Outlook

- Several Ideas for next year!
- What do you expect?
- What are our ideas?
- What data is available?

- **Breakout Session**:
  - Friday 11:00h
- **Fill in the survey**
  - **www.imageclef.org/survey**