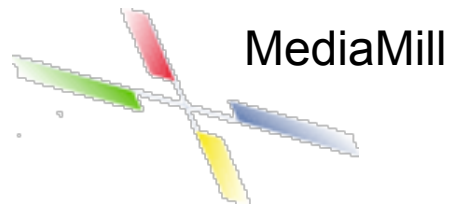


Predictive Video Retrieval

A Matter of Trust

Bouke Huurnink



UNIVERSITY OF AMSTERDAM



The Team

Bouke Huurnink

Jiyin He

Koen van de Sande

Ork de Rooij

Cees Snoek

Maarten de Rijke

Jan van Gemert

Jasper Uijlings

Xirong Li

Ivo Everts

Vladimir Nedovic

Michiel van Liempt

Richard van Balen

FeiYan

Muhammad Tahir

Krystian Mikolajczyk

Josef Kittler

Jan-Mark Geusebroek

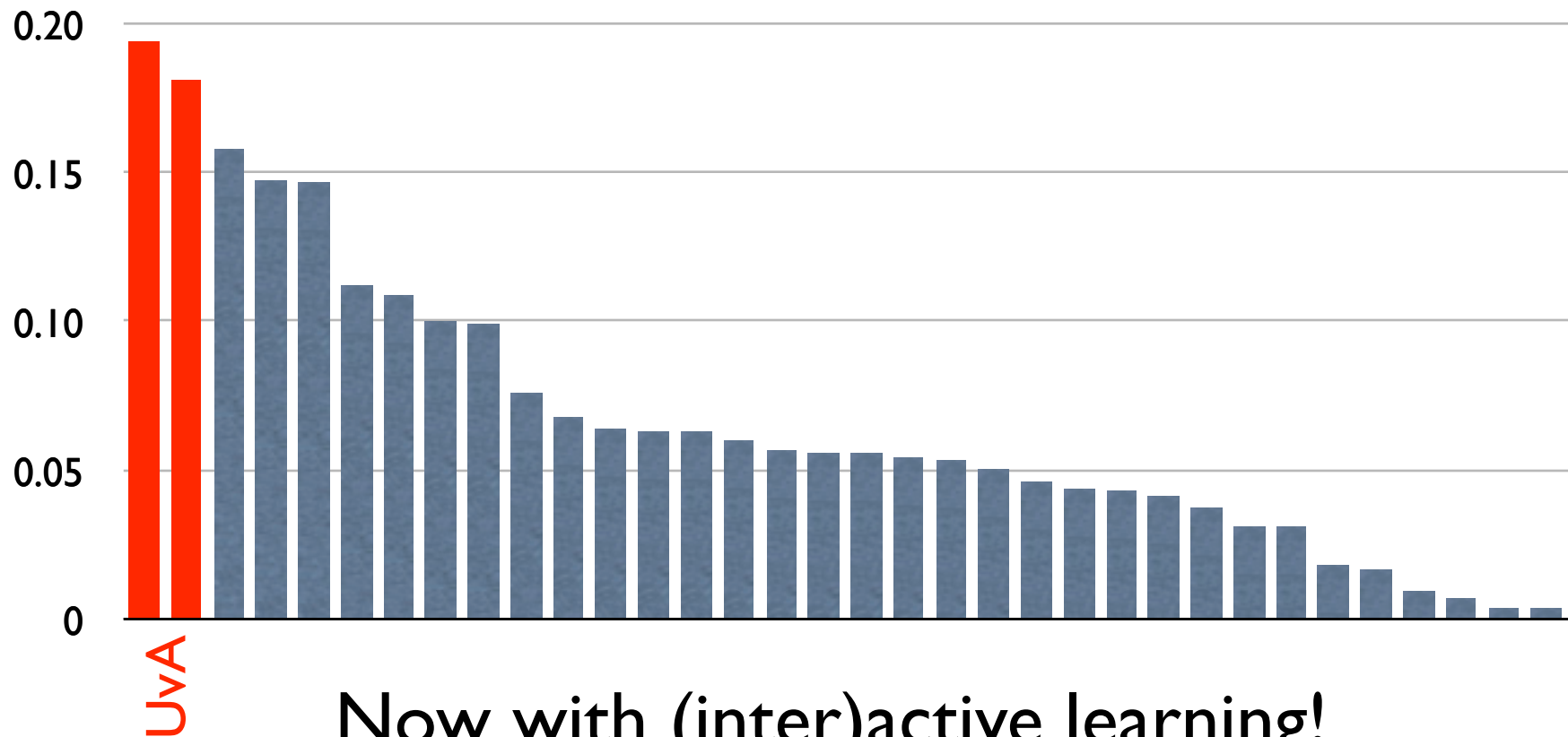
Theo Gevers

Marcel Worrying

Arnold Smeulders

Dennis Koelma

Come see our interactive search demo



Now with (inter)active learning!
Presented by Ork de Rooij

Why *predictive* video retrieval?

- Video retrieval is multichannel problem:
 - Speech
 - Detectors
 - Examples
- Observations
 - Speech works for named entity topics
 - Detectors work when closely related to topic
 - Examples can also work pretty well
- We want to exploit this knowledge

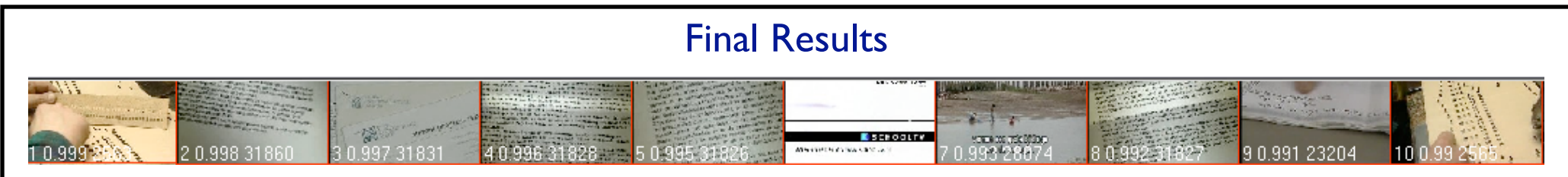
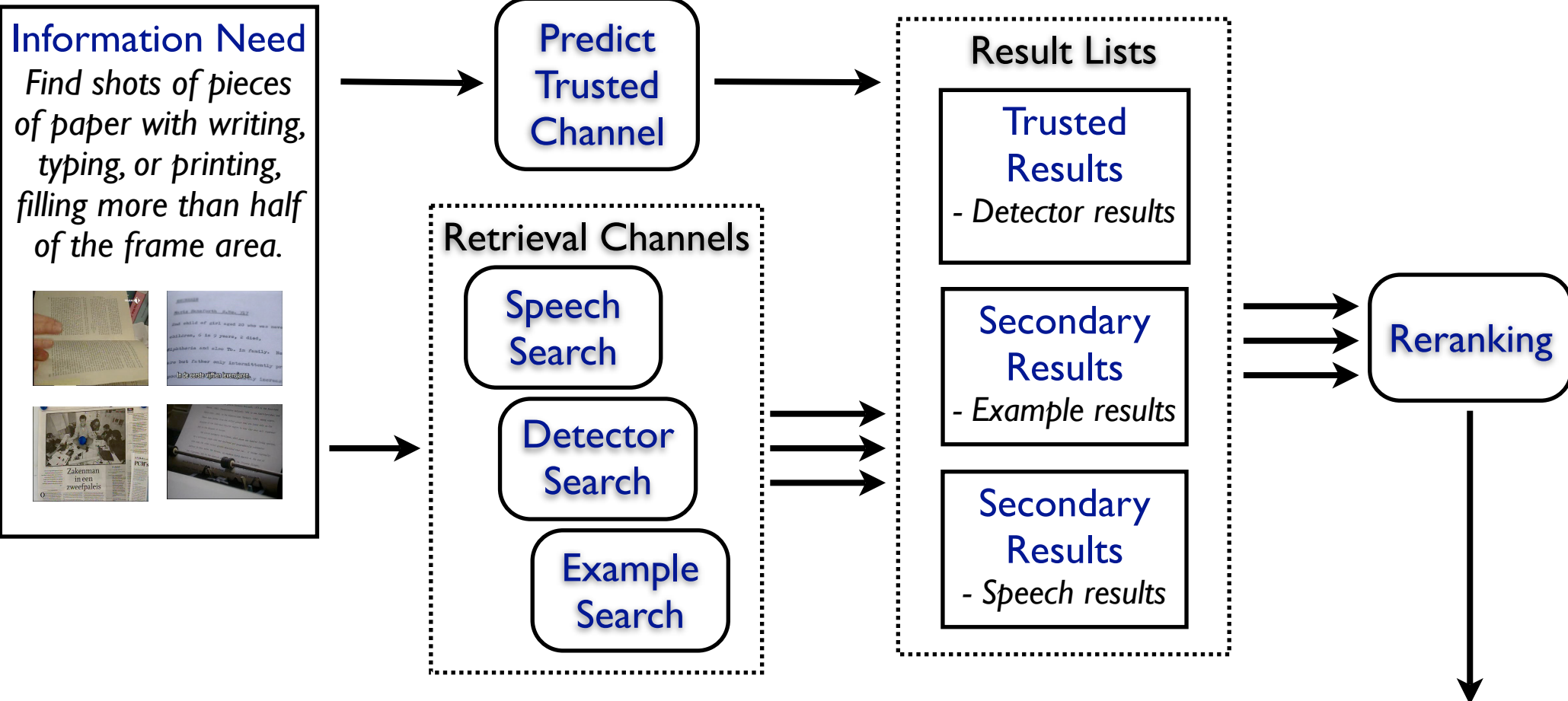
Idea

- Predict which type of search - *retrieval channel* - we can trust for a topic
- Rerank results from this channel with secondary result information

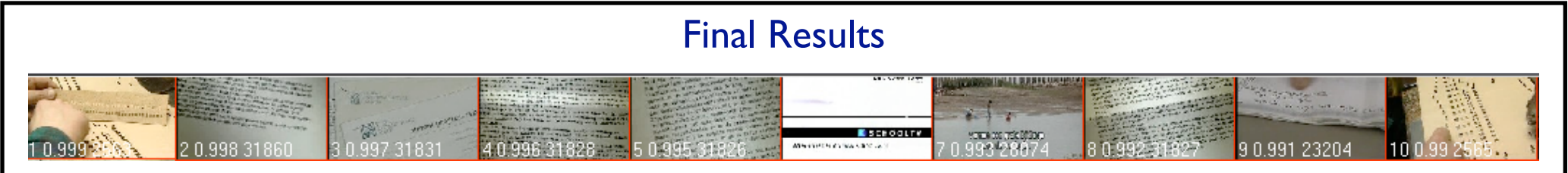
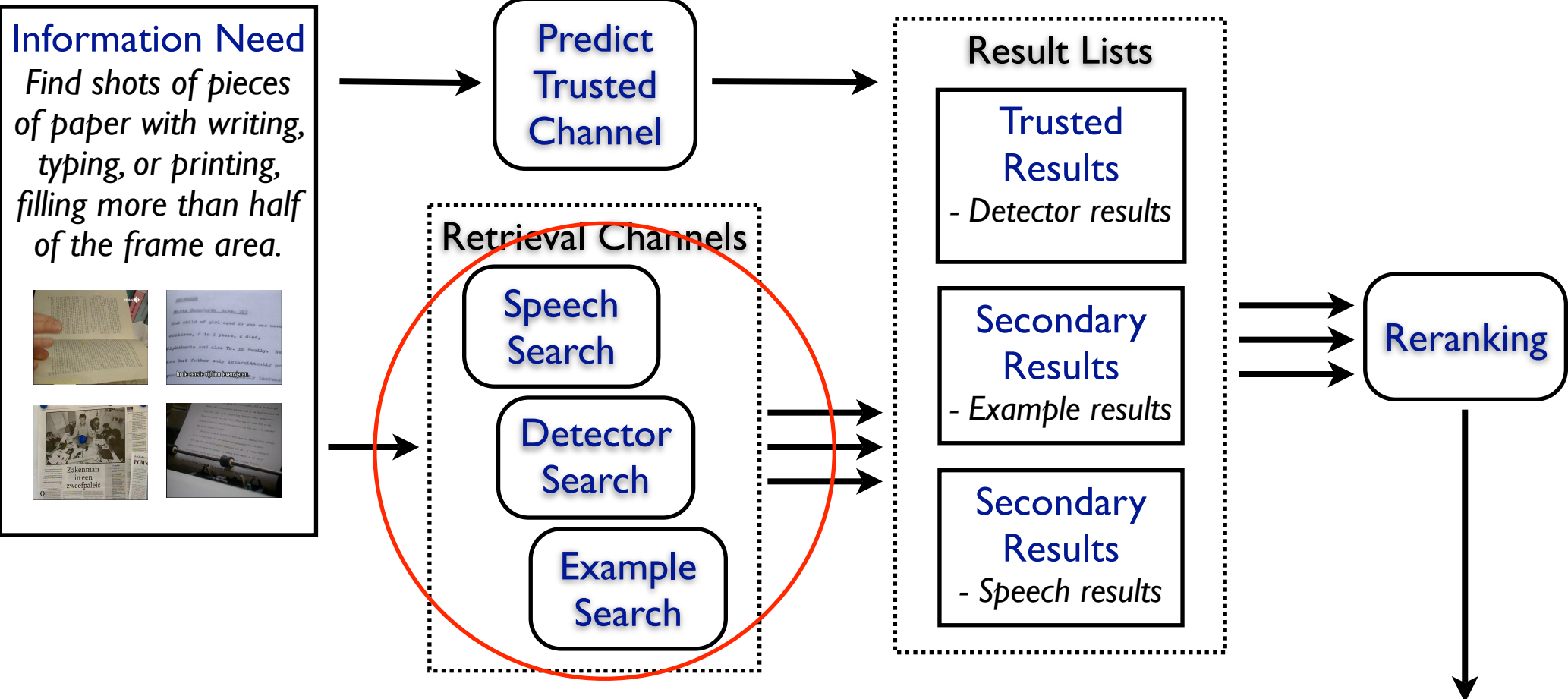
Outline

- System description
- Result overview
- Analysis
- Conclusion

Our predictive system

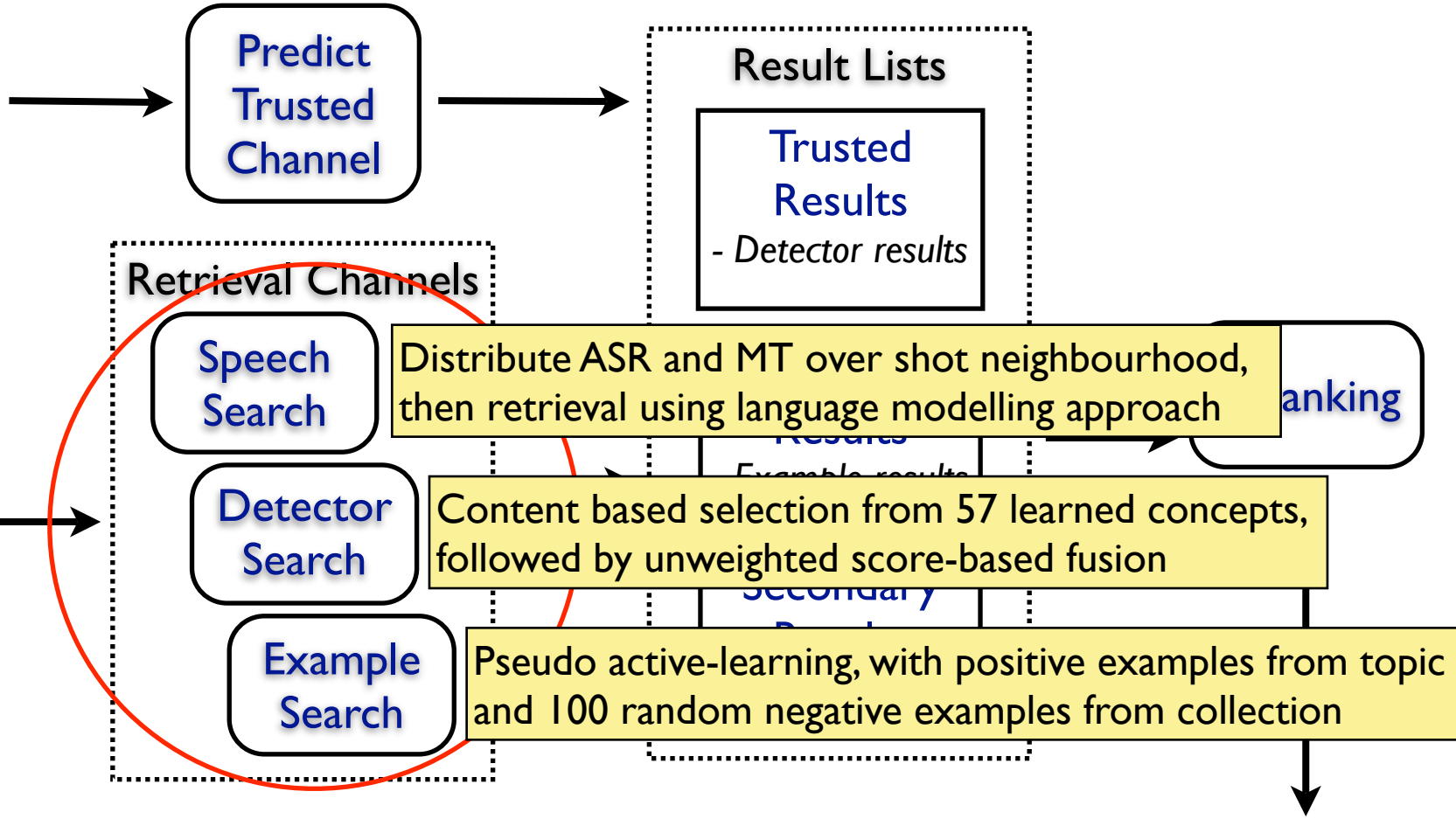


Our predictive system



Our predictive system

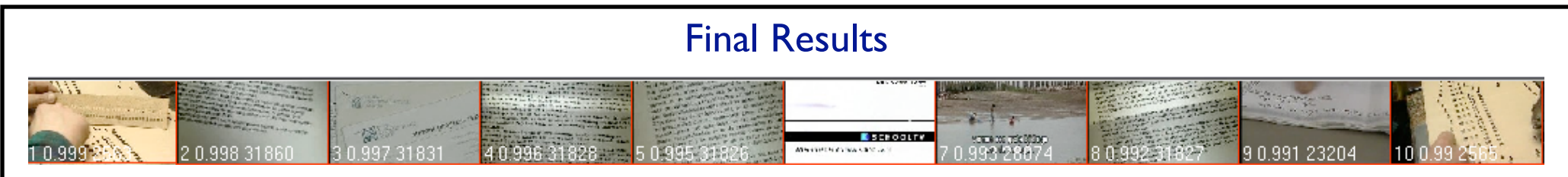
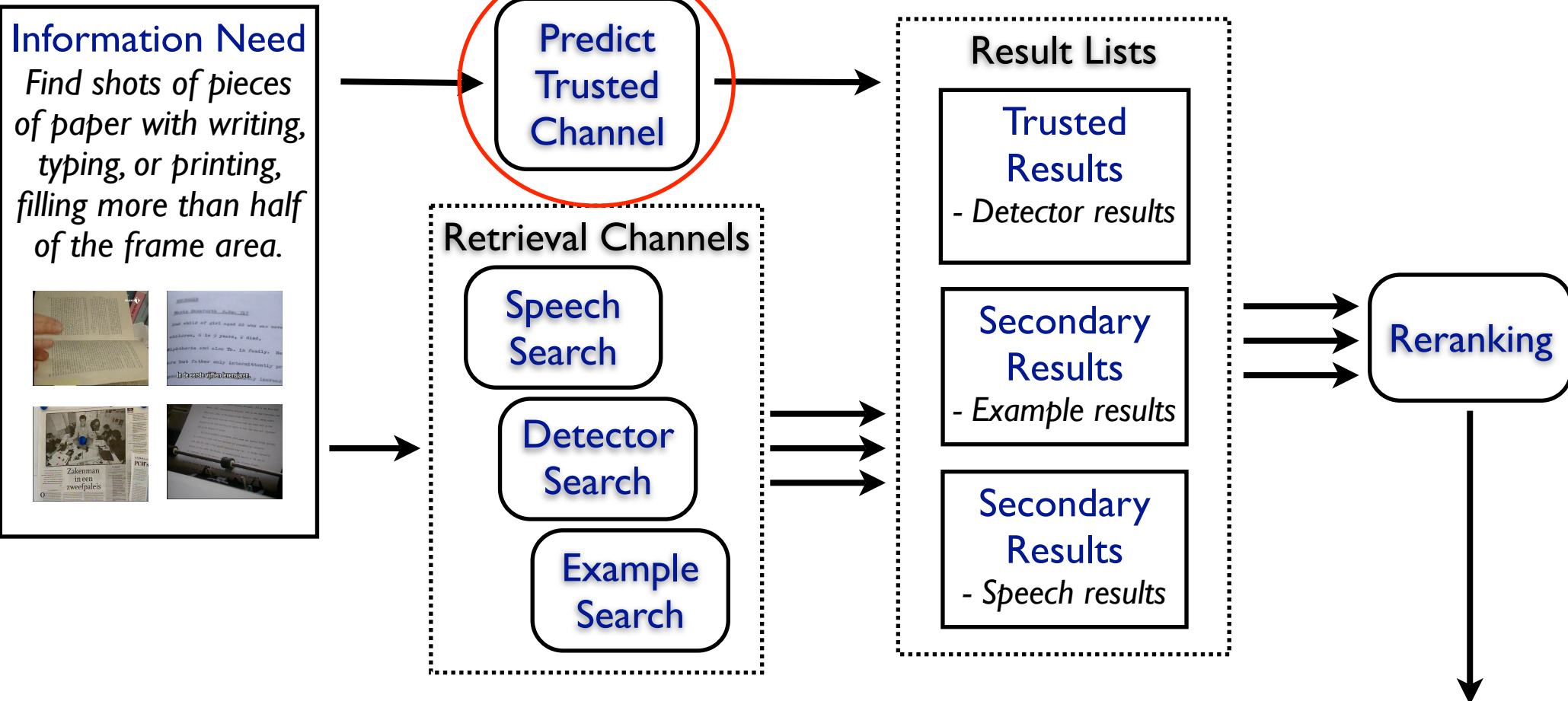
Information Need
 Find shots of pieces of paper with writing, typing, or printing, filling more than half of the frame area.



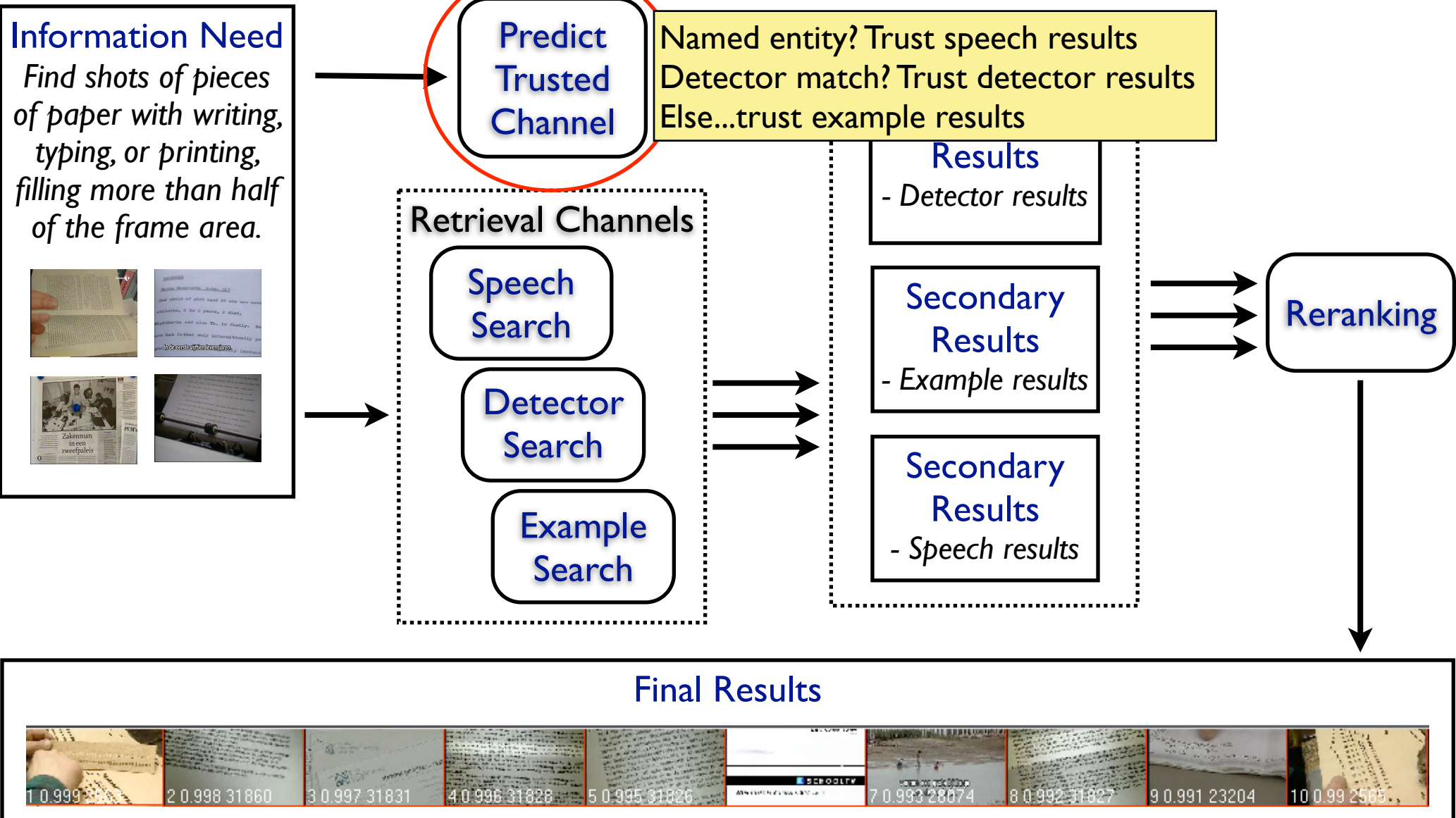
Final Results

1 0.999	2 0.998 31860	3 0.997 31831	4 0.996 31828	5 0.995 31826	6 0.994 31824	7 0.993 28874	8 0.992 31827	9 0.991 23204	10 0.99 2566
---------	---------------	---------------	---------------	---------------	---------------	---------------	---------------	---------------	--------------

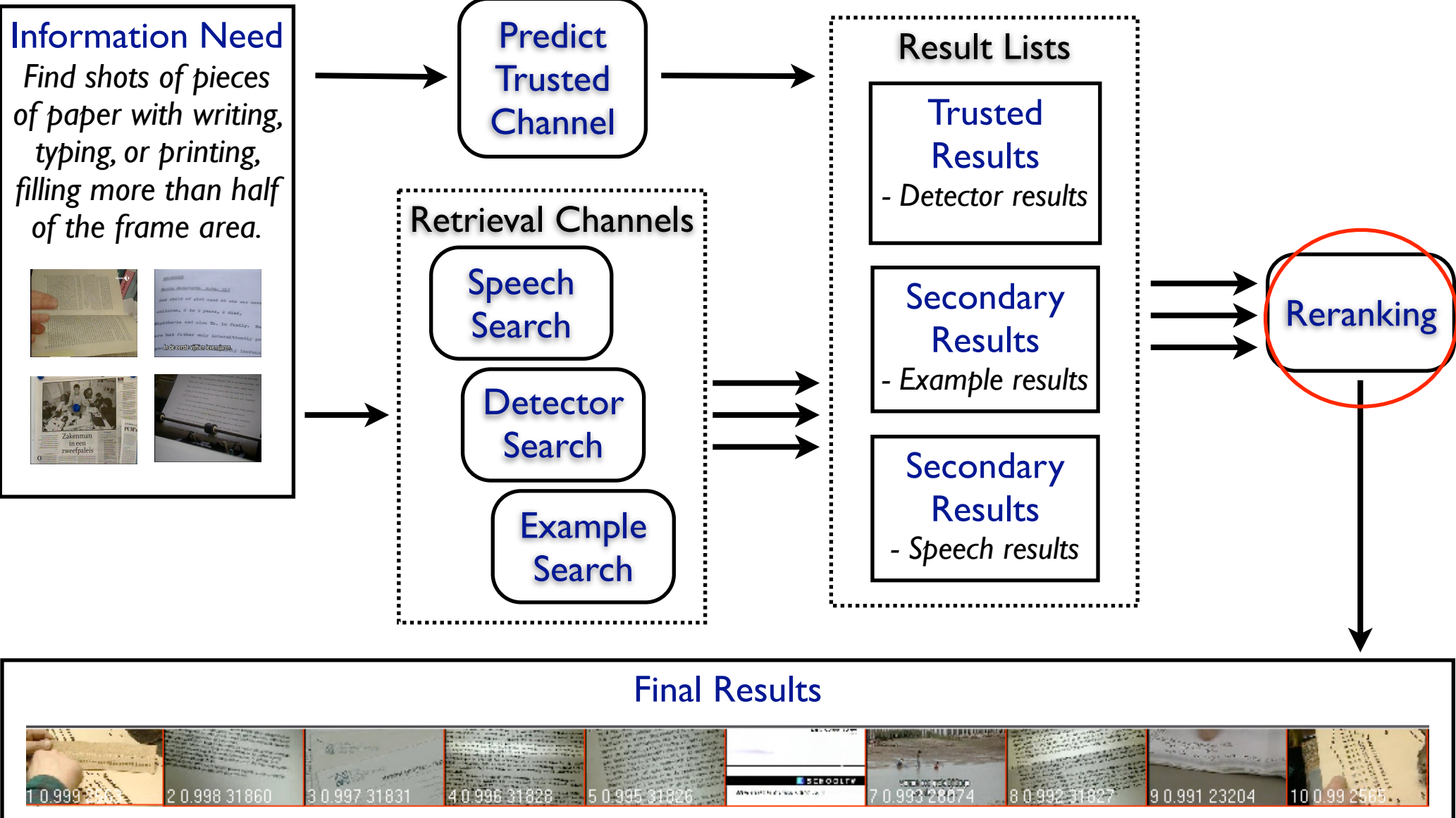
Our predictive system



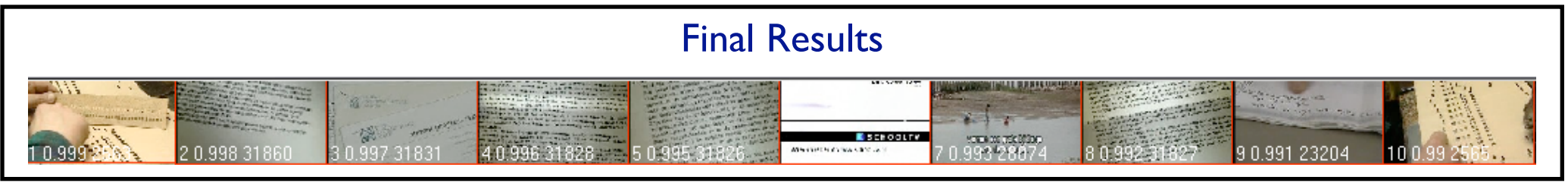
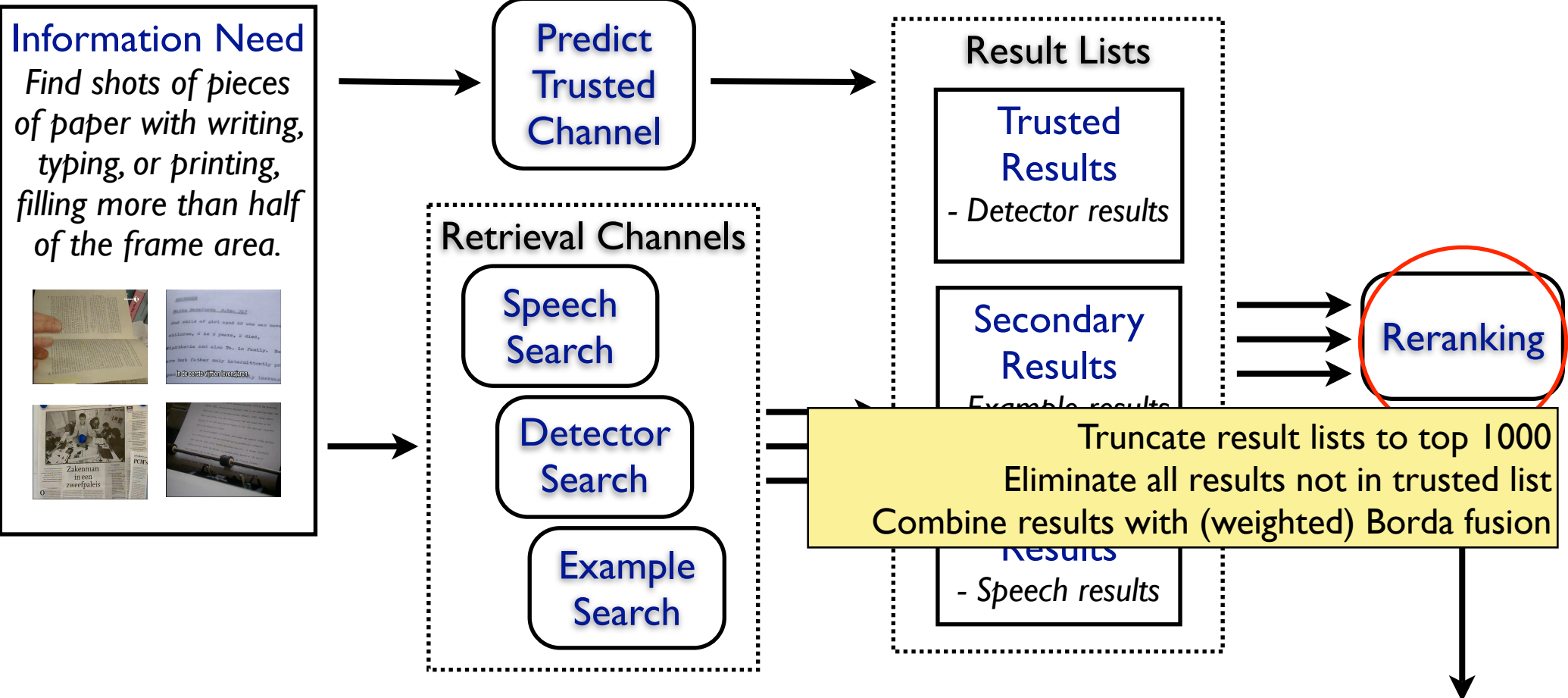
Our predictive system



Our predictive system



Our predictive system



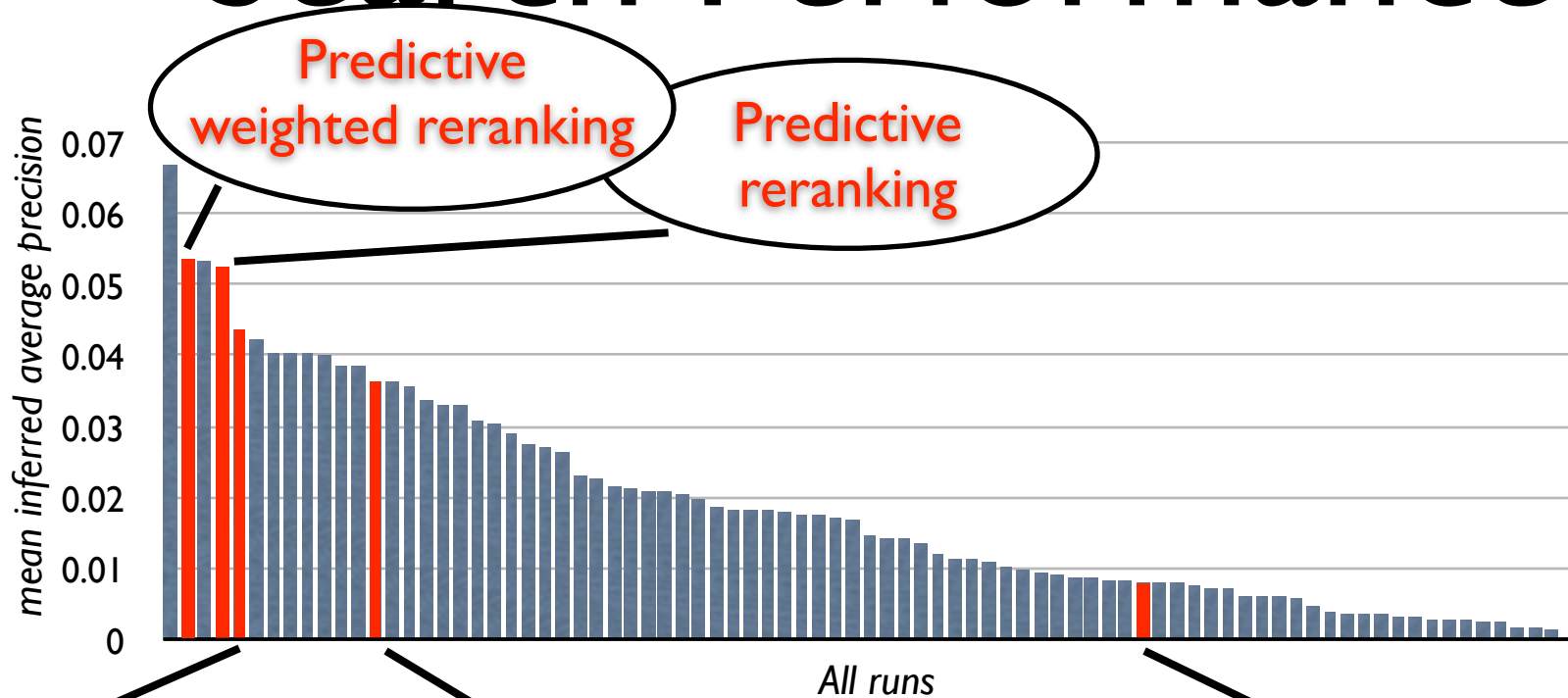
Query-class vs Prediction

<i>Query-class</i>	<i>Prediction</i>
Query class determines retrieval strategy	Query features determine retrieval strategy
Focus on assigning query-class dependent weights	Focus on identifying trusted retrieval channel

Runs

- Speech channel only *UvA-MM-6*
- Detector channel only *UvA-MM-5*
- Example channel only *supplementary*
- Predictive reranking *UvA-MM-4*
- Predictive weighted reranking *UvA-MM-3*

Overall Automatic Search Performance

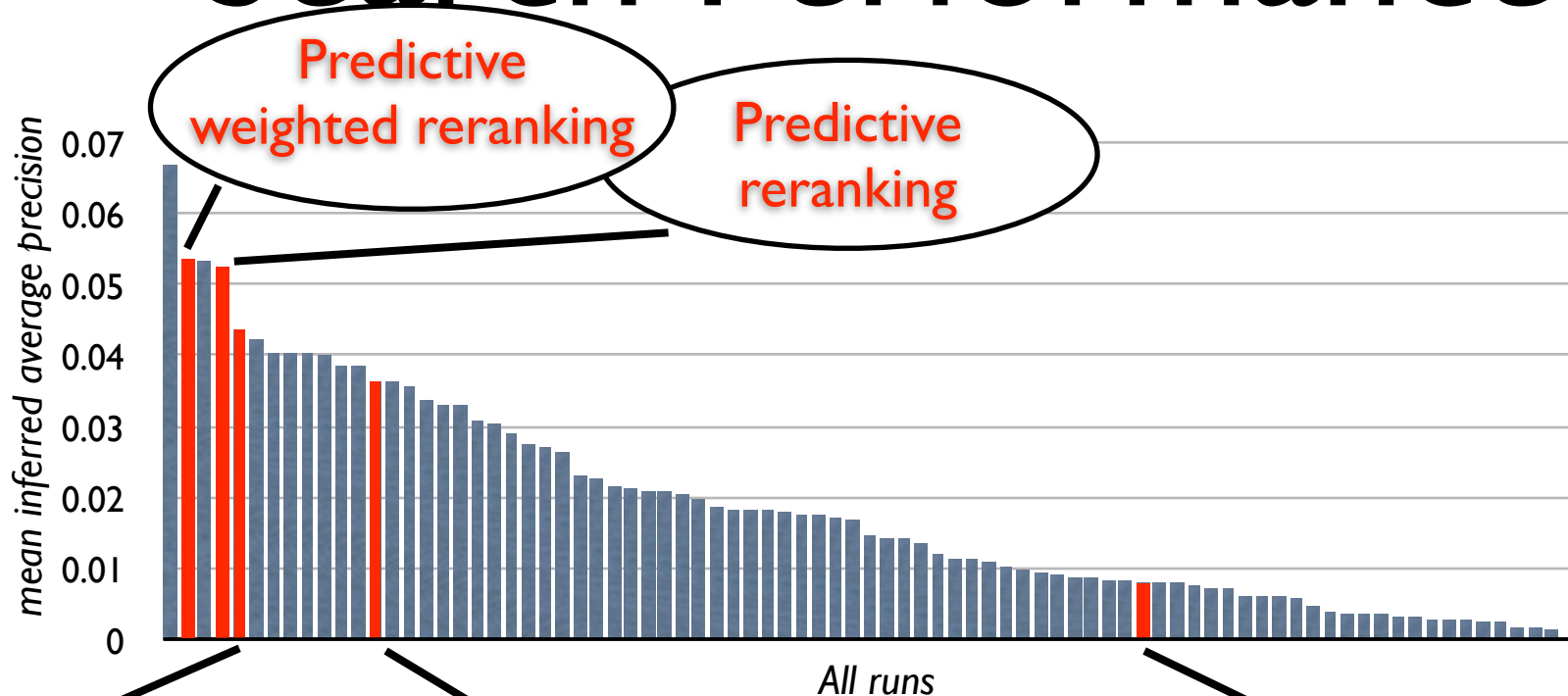


Detector channel

Example channel

Speech channel

Overall Automatic Search Performance



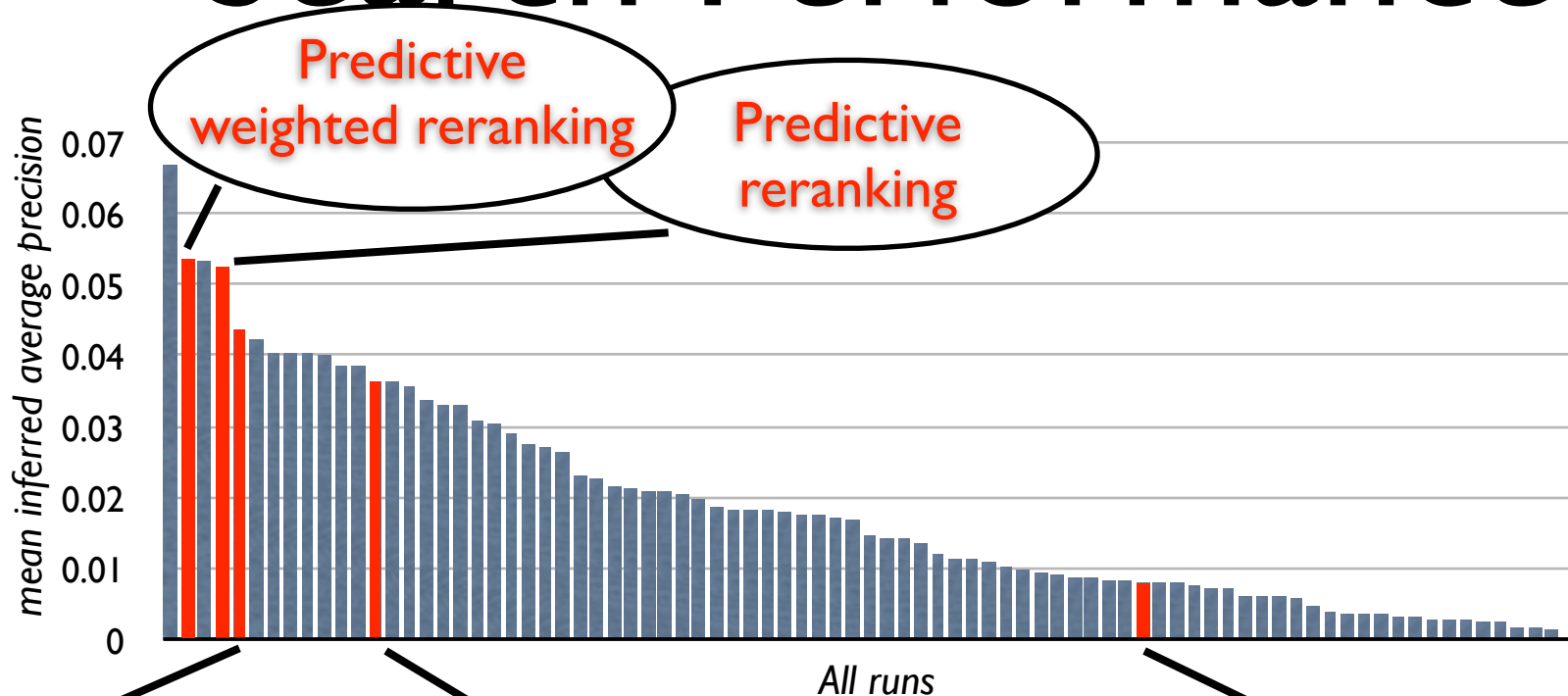
Detector channel

Example channel

Speech channel

Predictive reranking
outperforms individual channels

Overall Automatic Search Performance



Detector channel

Example channel

Speech channel

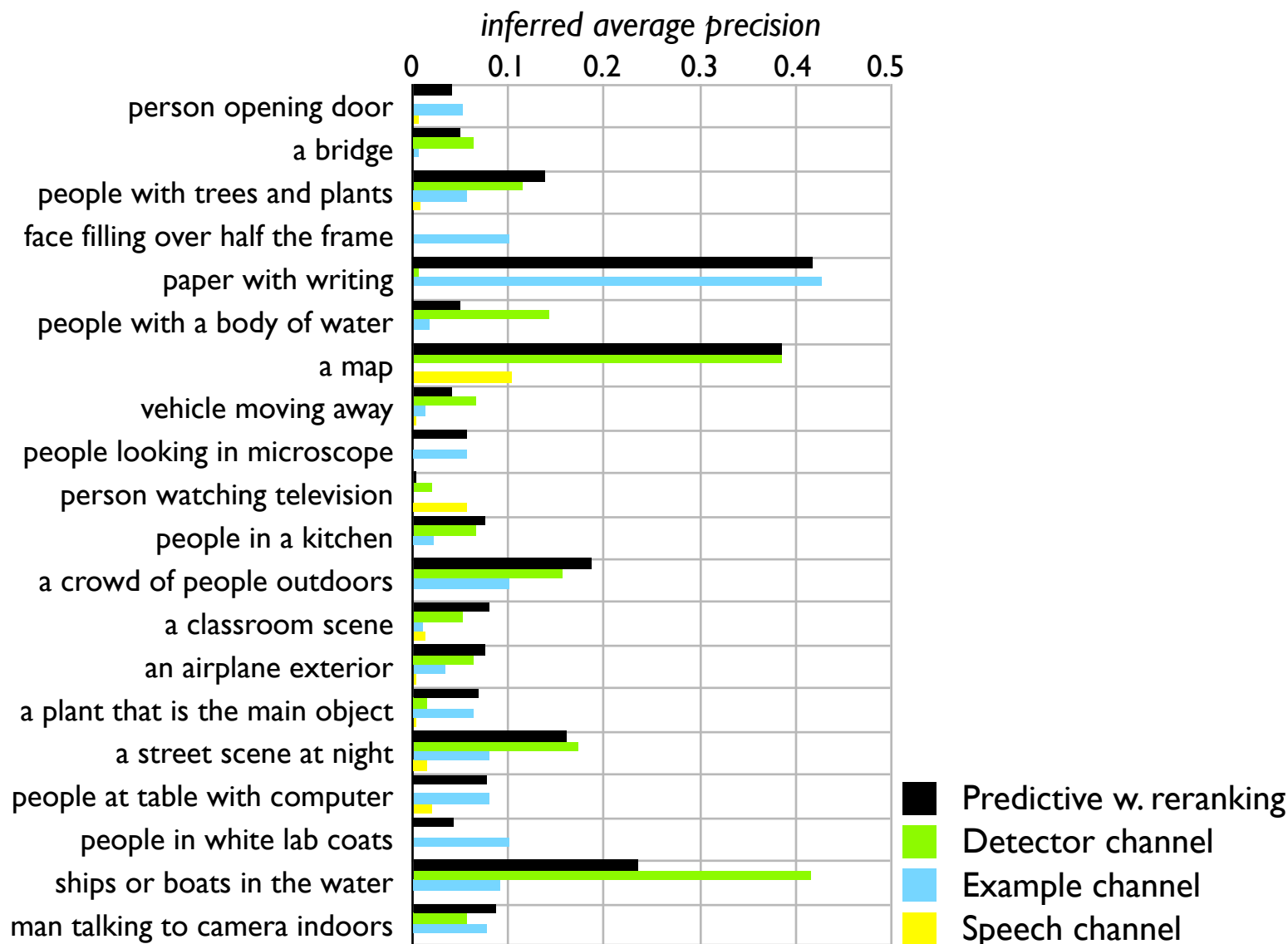
Predictive reranking
outperforms individual channels

Weighting did not have big
influence

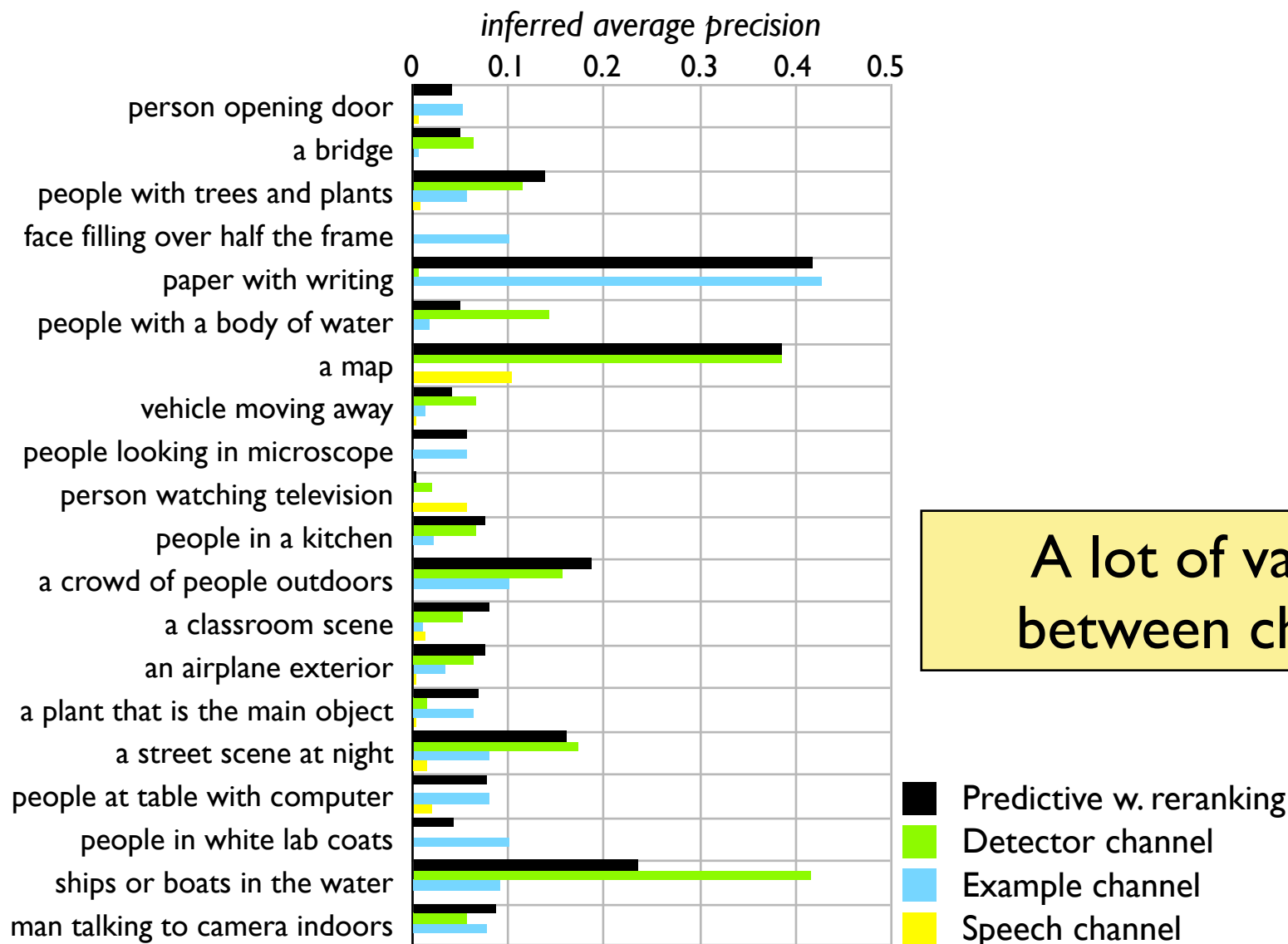
General findings

- 20 topics > 0.05 inferred average precision
 - 1 speech topic
 - 11 detector topics
 - 8 example topics
- Accurately predicted 15 of 20 topics

A closer look

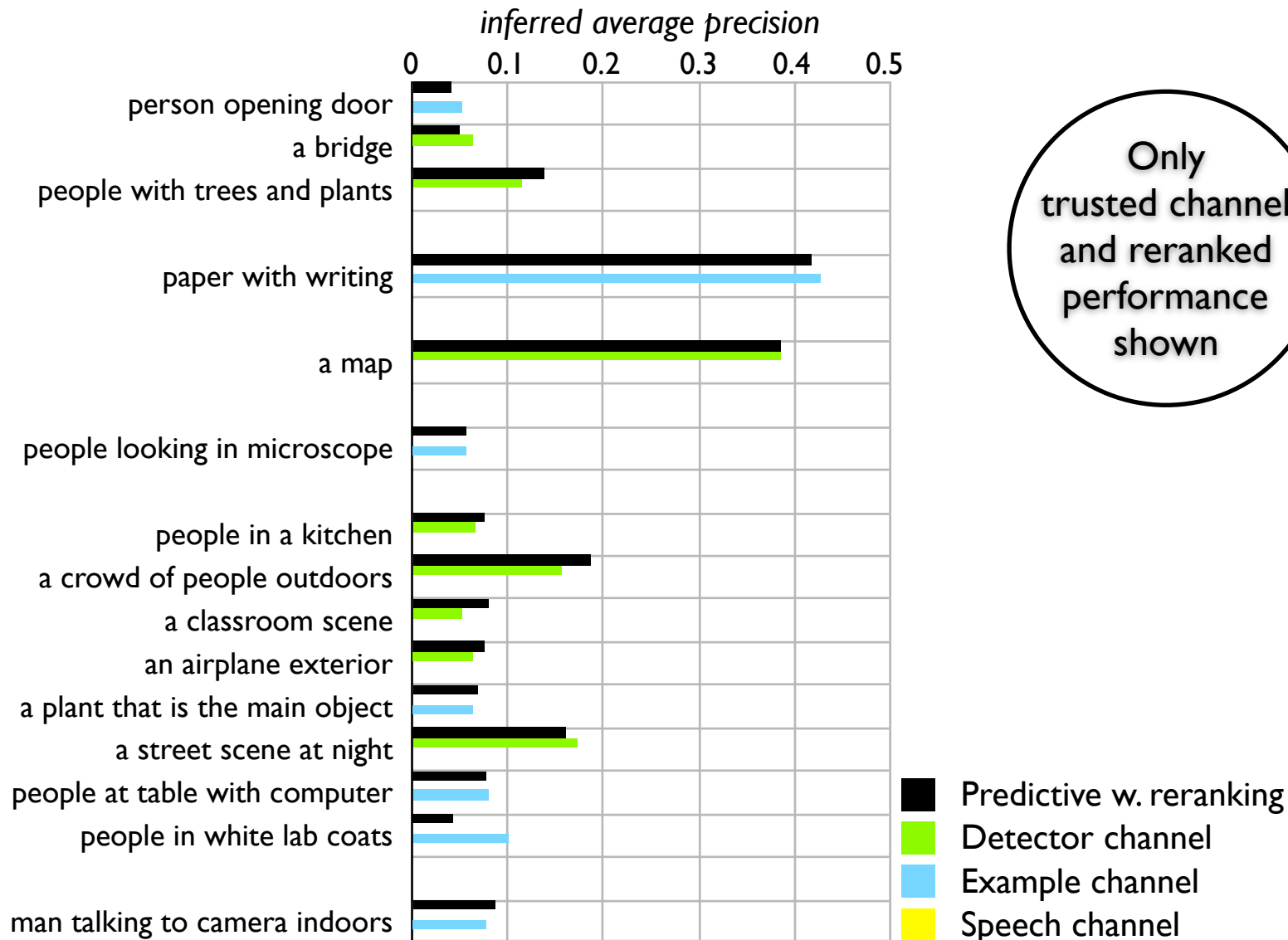


A closer look

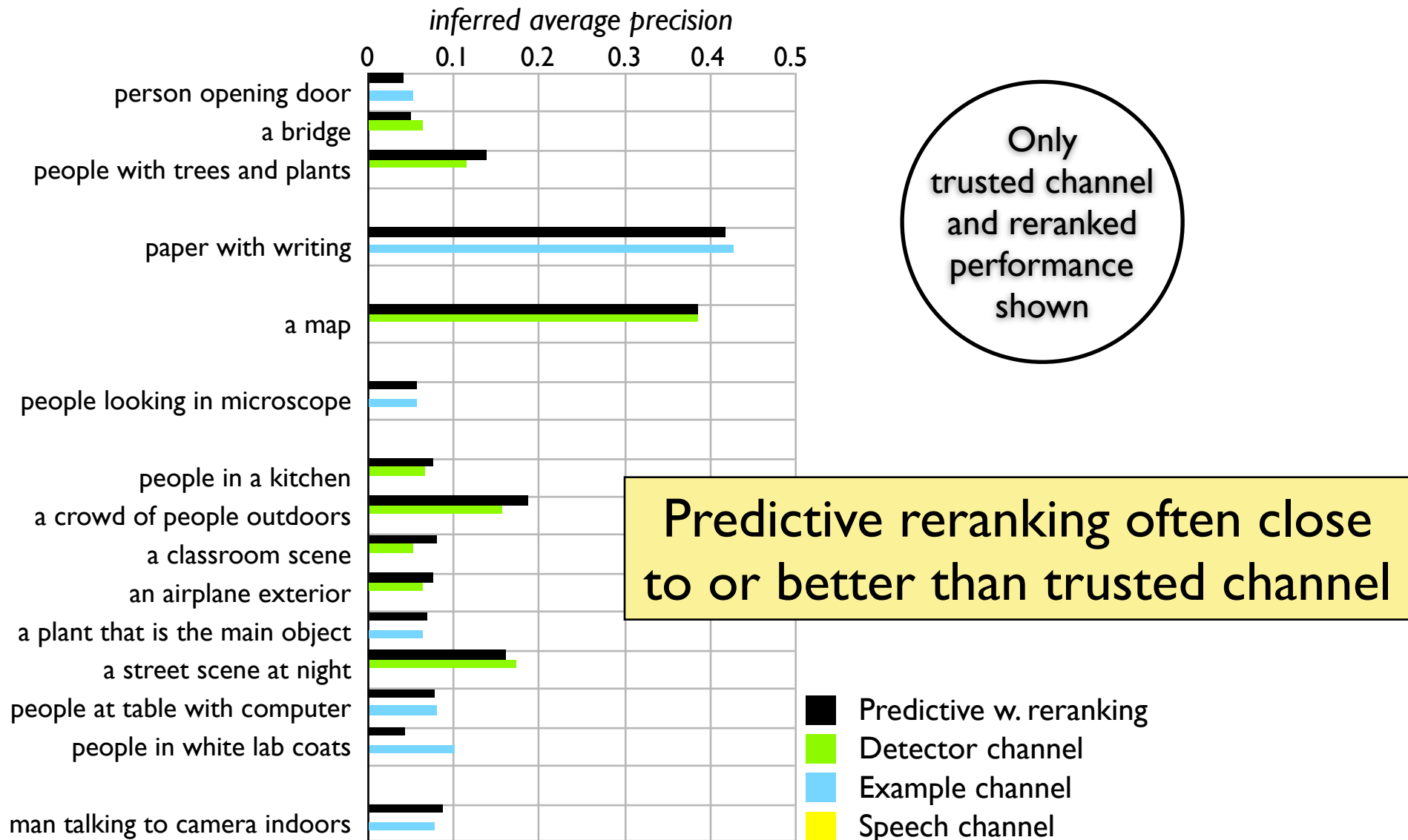


A lot of variance
between channels

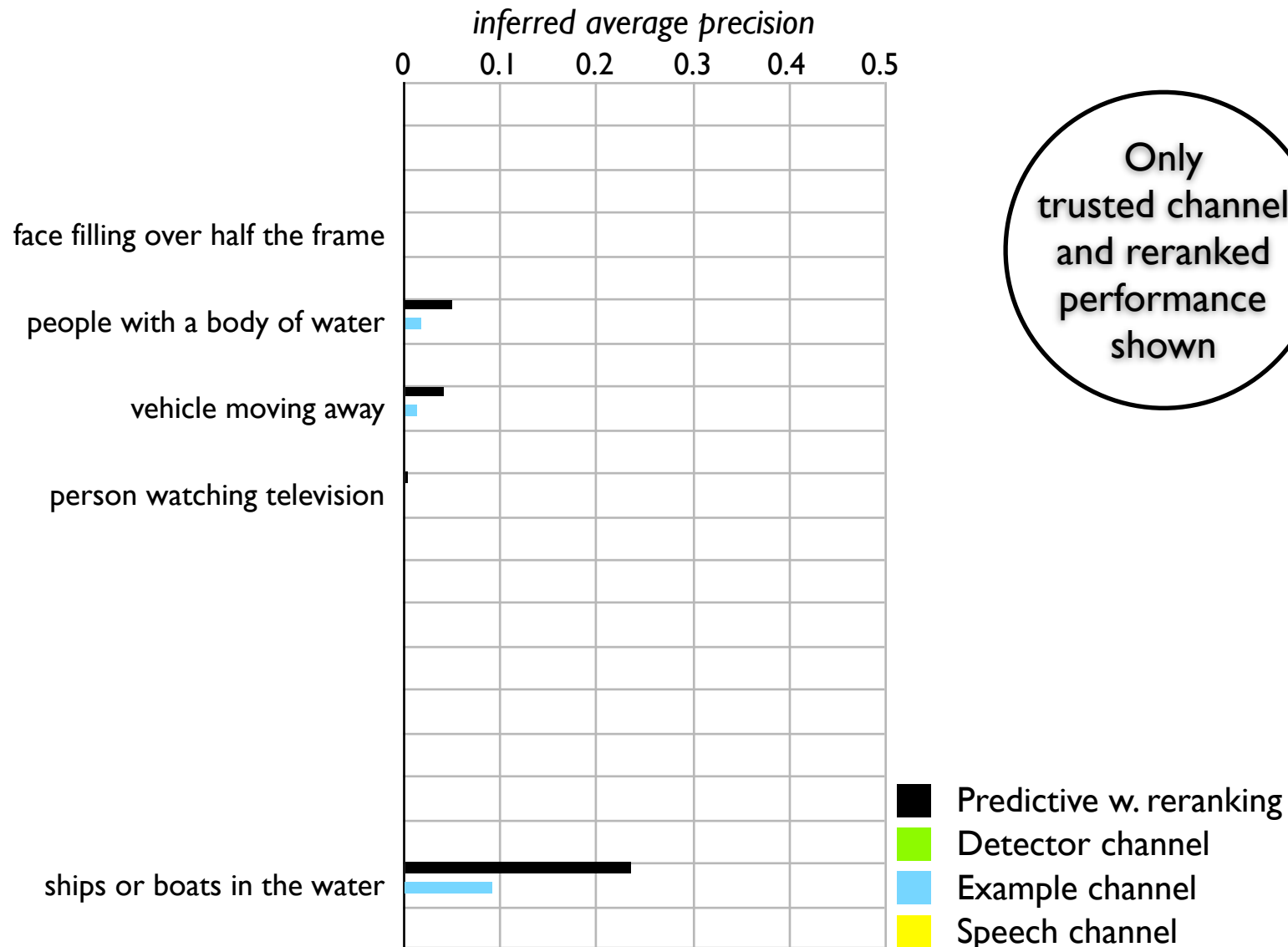
When prediction worked



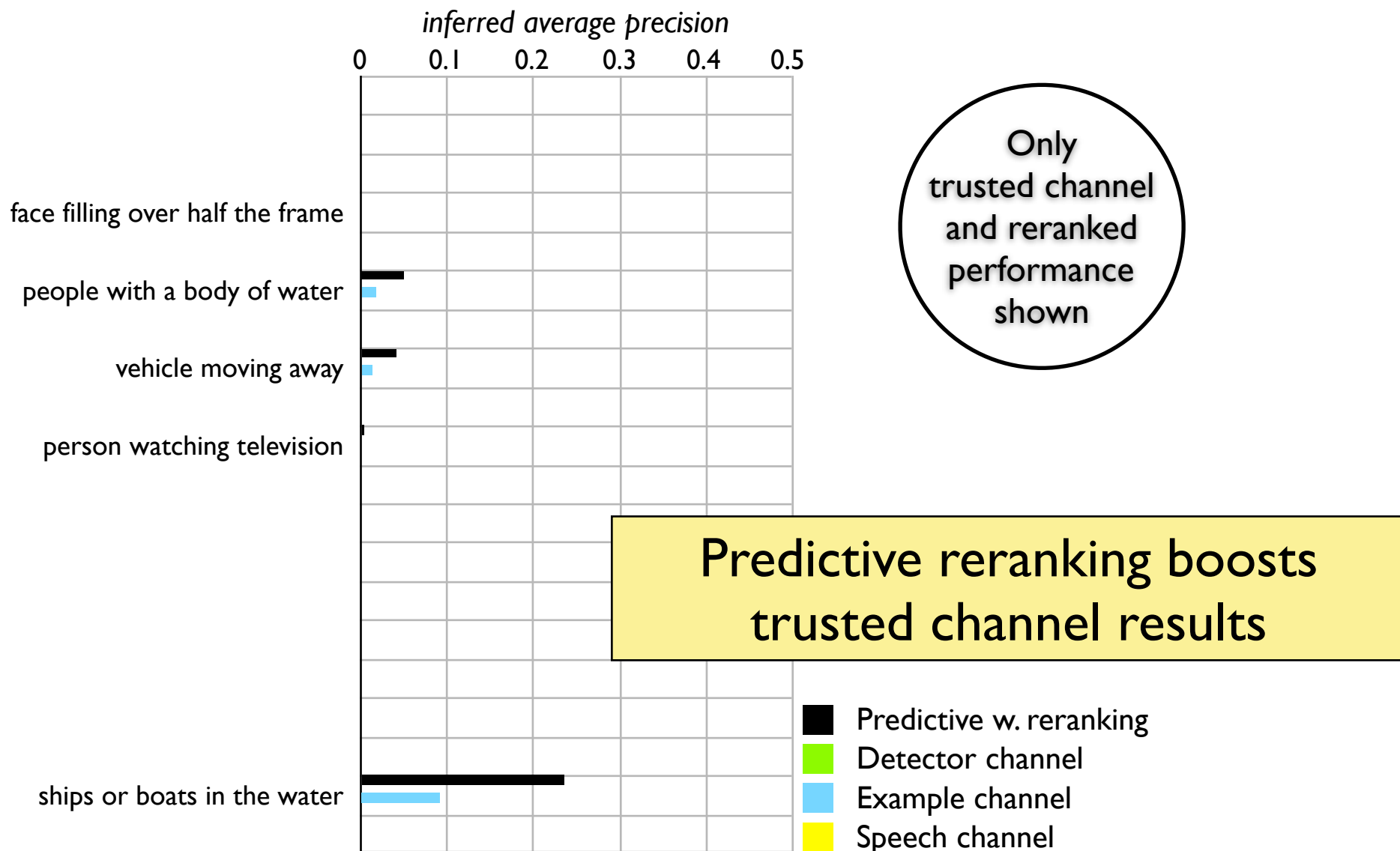
When prediction worked



When prediction didn't work



When prediction didn't work



Conclusions

Conclusions

Predictive retrieval works, even with simple reranking

Conclusions

Predictive retrieval works, even with simple reranking

Incorrect predictions have limited impact

Conclusions

Predictive retrieval works, even with simple reranking

Incorrect predictions have limited impact

Good ingredients are crucial:
garbage in garbage out!

Pondering

- What if we had more variety in query types?

Beeld en Geluid Searches

20 20 uur 20 uur journaal **laartsen** afghanistan **ajax** algemene beschouwingen **amsterdam**
andere tijden avondjournaal **balkenende** **beatrix** buitenhof **bush** close up
de wereld draait door **debat** eevandaag evn **feyenoord** **gemeenteraadsverkiezingen**
goedemorgen nederland **hirsi ali** holland sport **holleeder** internationale nieuwsuitwisseling irak
iran **jeugdjournaal** **journaal** journaal 20 kassa klokhuis
koefnoen koninginnedag kooten kopspijkers kro kruispunt langs de lijn libanon lijst 0 lingo **man bijt hond**
max catherine **maxima** **mens** **milosevic** **miniatuur** **moszkowicz** nederland kiest **netwerk** nieuwslicht
nioscoop nos **nos** **journaal nova** nps arena opsporing verzocht paul de leeuw pauw pauw en
witteman pauw witteman pechtold **politie** polygoon radar **rembrandt** **rouvoet** **rutte** **saddam** **schepper**
CO schepper en co schipholbrand **sesamstraat** sonja spiritus sporen uit het oosten **sport** sportjournaal
studio sport tegenlicht **televisie** tros tv show **twee** **vandaag** uruzgan vandaag
verdonk **verkiezingen** **voetbal** vragenuur vragenuurtje vroege vogels wereld draait door **wilders** **wouter bos**
zembla zoekt en gij zult vinden zomergasten

General
object queries

Named entity
queries