

Research Methods in computer science

Fall 2014

Lecture 4

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Agenda

Research Conference Updates

Experiment Design

Deployment Experiments

Feedback from HW2

HW3

Experiments

Hypothesis

Scenarios

Measurements

Conclusions

Types of Experiments

Model / Analysis

Simulations

Testbed (Real world ^{lite})

“Real world”

Which one to use when?

Scenarios

Types of inputs

Types of configurations

Try to keep the number of scenarios small while covering normal and meaningful corner cases.

A new image recognition system...

What inputs should we use?

Random library from Flickr

Algorithm specific

Standard datasets

Hypothesis

Experiments: hypothesis testing

Bias in hypothesis

Examples

Metrics

Systems

Throughput

Latency

Overhead

Reliability

Classification

Precision

Recall

Running time

HCI

Accuracy

Latency

“Discomfort”

Conclusions from Experiments

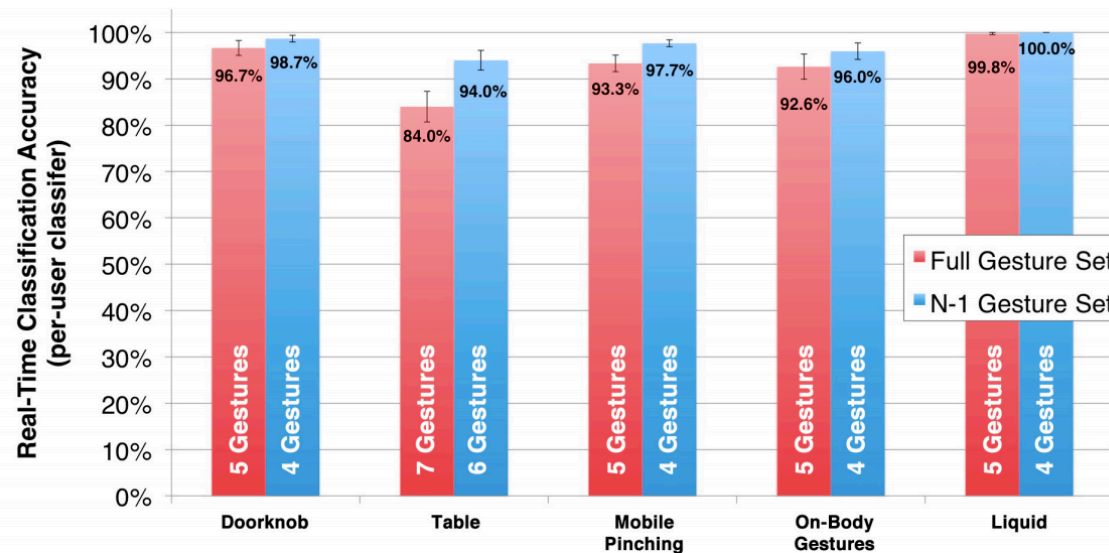
Strict interpretation

Extrapolate

Touché: Enhancing Touch Interaction on Humans, Screens, Liquids, and Everyday Objects

[Sato '12]

What hypothesis, scenarios, and metrics
should we expect to see in this paper?



[Sato '12]

Figure 11. Real-time, per-user classification accuracy for five example applications.

What are the (missing) scenarios and (missing) metrics? What can we conclude?

Fast, Accurate Detection of 100,000 Object Classes on a Single Machine

[Dean '13]

What hypothesis, scenarios, and metrics should we expect to see in this paper?

	arp	bike	bird	boat	btfl	bus	car	cat	chr	cow	tbl	dog	hrs	mbke	prsn	plnt	shp	sofa	trn	tv	Mean
Ours	0.19	0.48	0.03	0.10	0.16	0.41	0.44	0.09	0.15	0.19	0.23	0.10	0.52	0.34	0.20	0.10	0.16	0.28	0.34	0.34	0.24
[6] (base)	0.29	0.55	0.01	0.13	0.26	0.39	0.46	0.16	0.16	0.17	0.25	0.05	0.44	0.38	0.35	0.09	0.17	0.22	0.34	0.39	0.26

Table 1. Comparison of the hashing-based and baseline algorithms on the PASAL VOC 2007 dataset

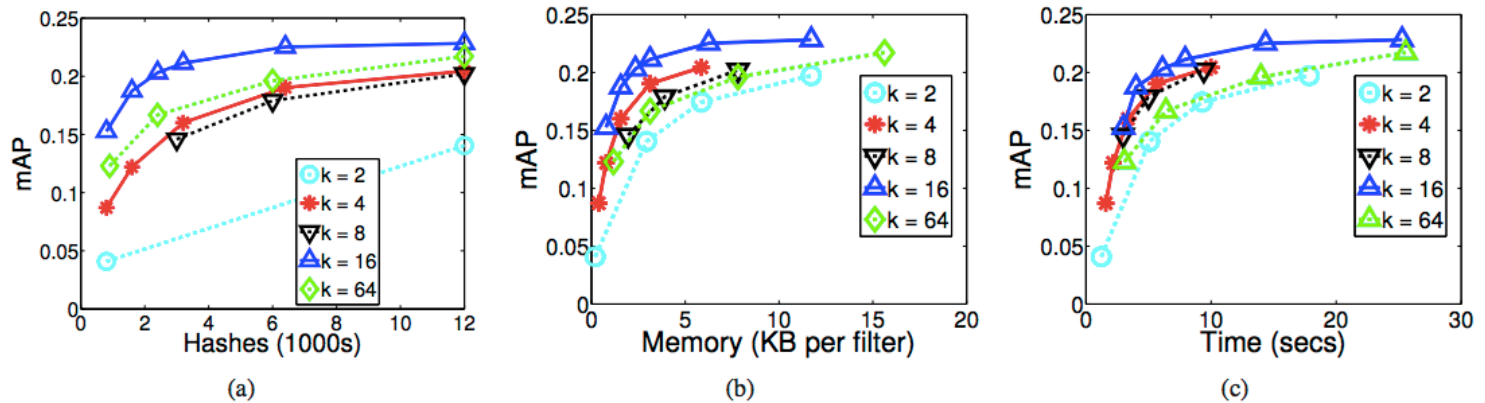


Figure 3. Effect of hashing parameters on the accuracy, speed and memory required by the system.

[Dean '13]

What are the (missing) scenarios and (missing) metrics? What can we conclude?

HW3

Write one-paragraph summary of the proposed project.

Write a paragraph addressing each “Research Formulation” questions. The complete writeup should not be longer than two pages.