

Participants

Short name

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- ☞ Fernando Alonso, Universidad Autonoma de Madrid, (UPM), Spain
- ☞ O Fatukasi and N. Poh, U. of Surrey (UniS), UK.
- ☞ Harald Ganster, Joanneum Research (JR), Austria
- ☞ Albert Salah and Onkar Ambekar, Centrum voor Wiskunde en Informatica (CWI), the Netherlands
- ☞ John Baker, Johns Hopkins University Applied Physics Laboratory (JHUAPL), USA

Slide 1

Algorithms

AMSL-BIO

- ☞ Weighted averaging

GET

- ☞ Sequential fusion strategy
- ☞ Gaussian mixture model

UPM

- ☞ Linear logistic regression optimising a cost objective function

UniS

- ☞ Logistic regression in score/quality space
- ☞ quality based clustering fixed rule fusion
- ☞ naïve Bayes

JR

- ☞ Dempster-Shafer fusion

CWI

- ☞ Mixture of factor analysers

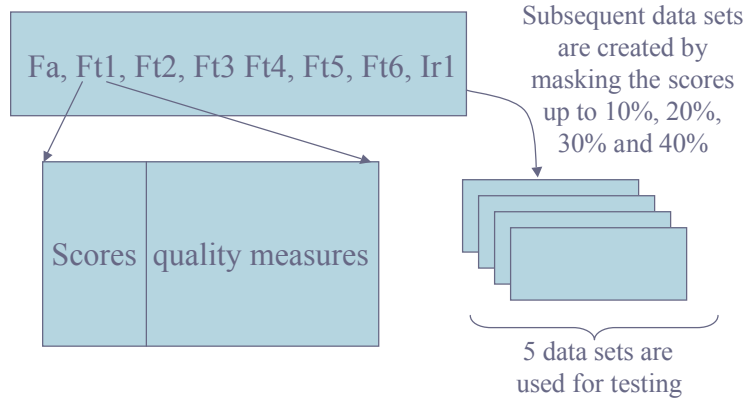
JHUAPL

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Results of Cost-based Evaluation

Slide 3

Dataset Used



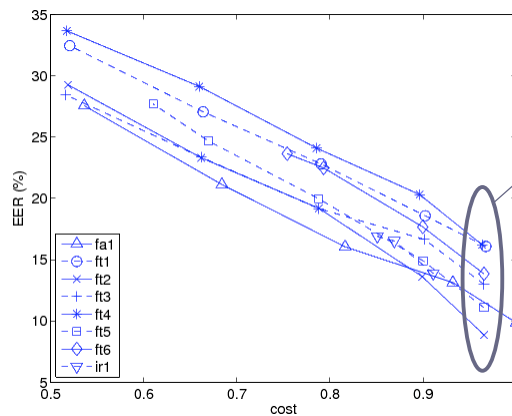
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Cost assignment strategy

- ☞ If you use one score/quality measure, you are charged a unit cost
- ☞ If you use subsequent images from the same device, you are charged 0.3 unit
- ☞ A cost is charged for using a device to acquire the sample, regardless of whether or not the resulting match score/quality measures will participate in the final fusion process
- ☞ All devices are charged the same way regardless of the actual physical unit cost

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Baseline Performance

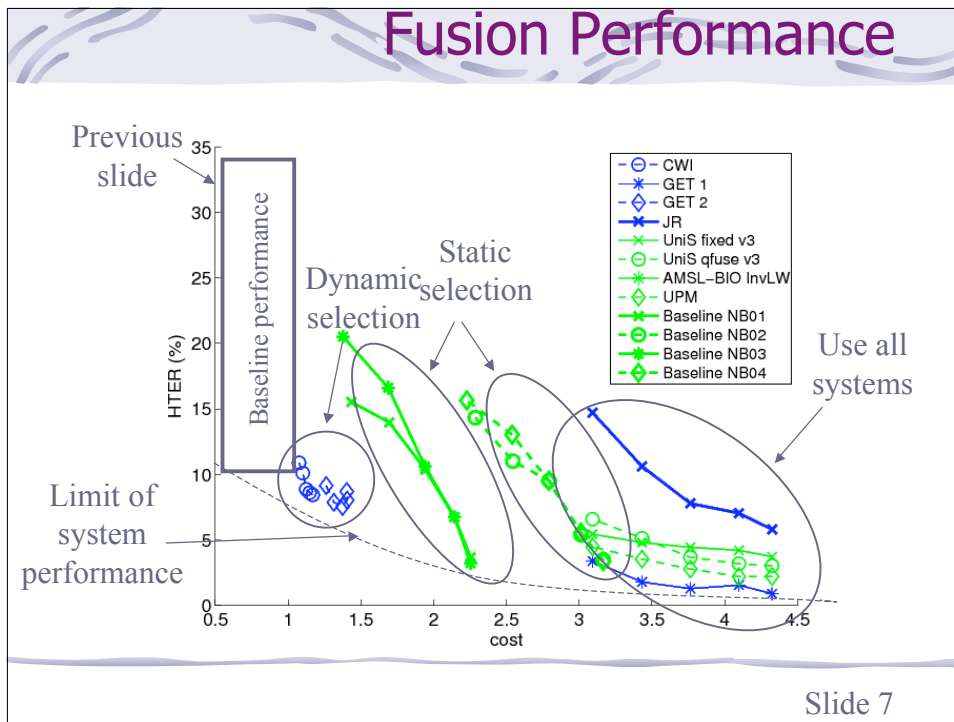


The fingerprint data always contains missing data due to failure to process or to match queries

Note: If all the data in a channel is used, the average cost per access is simply 1.

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Fusion Performance

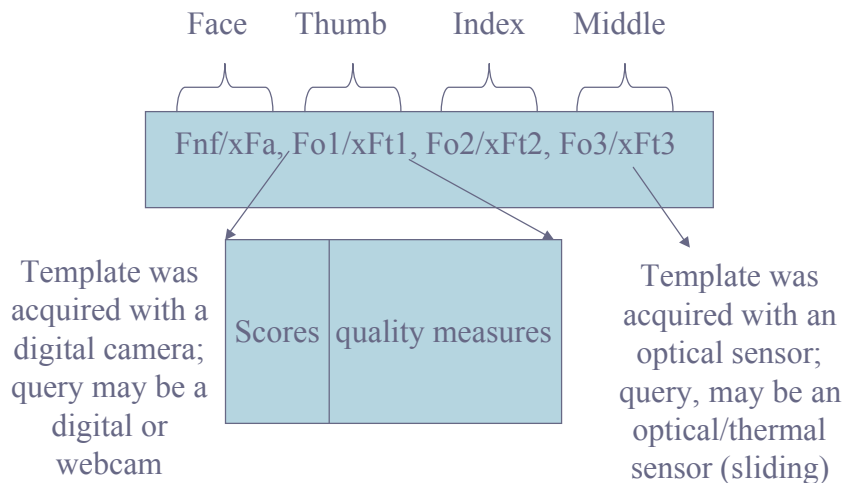


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Results of Quality-based Evaluation

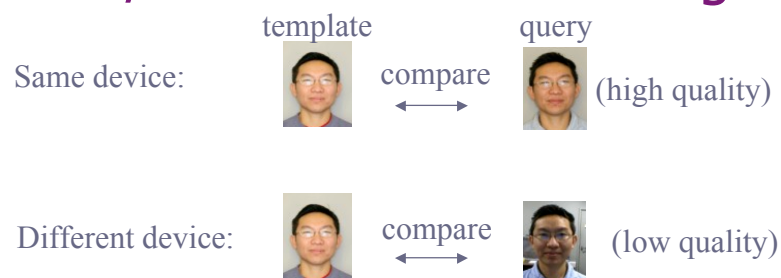
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Dataset Used



Slide 9

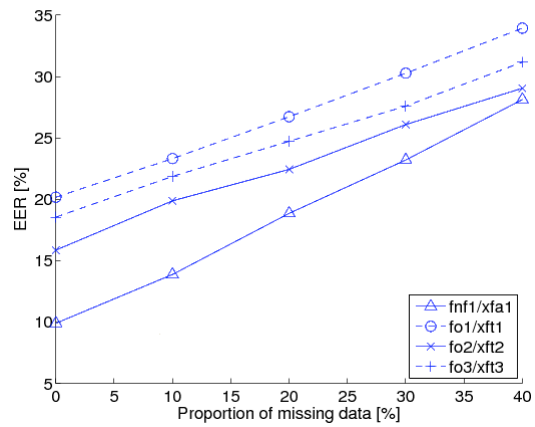
Same/Cross Device Matching



The template is of high quality; the query may be acquired with a high quality or low quality device

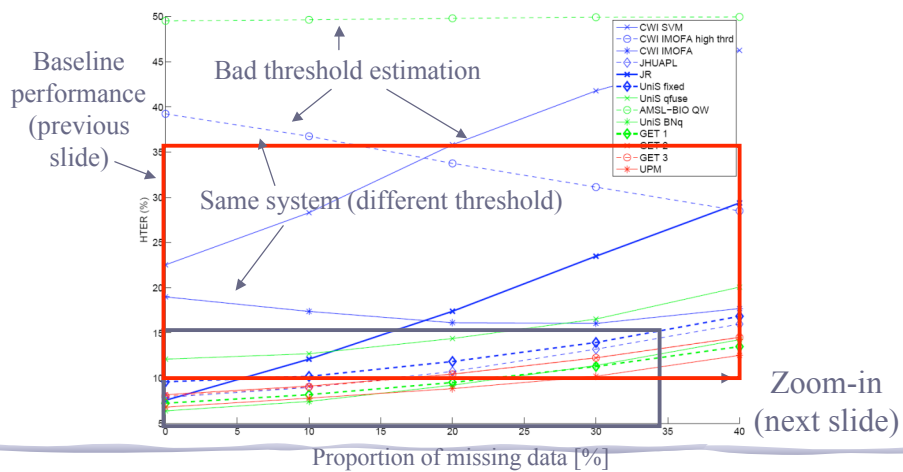
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Performance



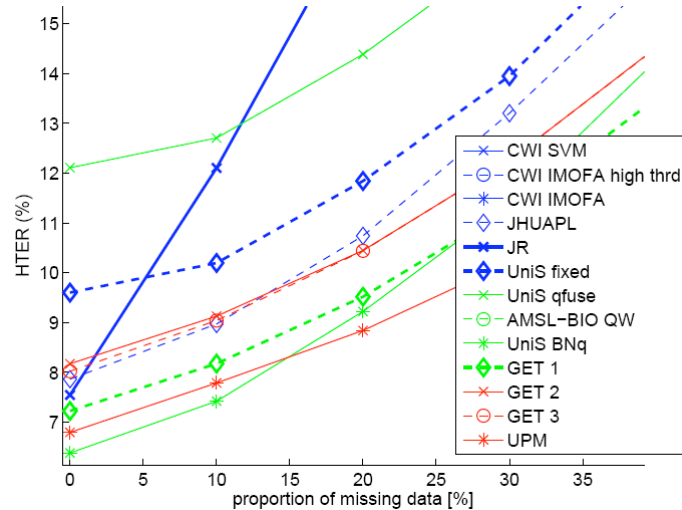
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Fusion Performance (HTER)



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Zoom-in



Slide 13

Conclusions

- ☞ In a cost-sensitive evaluation, dynamic system selection strategy appears promising
- ☞ Threshold estimation is important
- ☞ Handling missing information dynamically is a practical requirement
- ☞ A first attempt to estimate mismatched performance
- ☞ Quality measures help
 - Improved performance in general
 - Dramatically improved resilience to missing data
- ☞ Future work:
 - Better quality measures
 - Better reference algorithms
 - Better fusion algorithms
 - More rigorous test (on a larger database)

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