WP4: Adaptive systems

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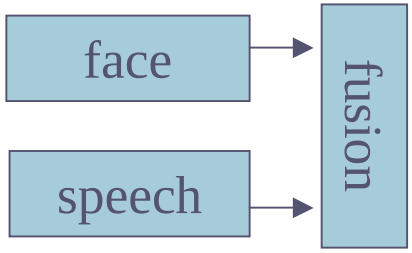
An Overview

Baseline non-adaptive fusion

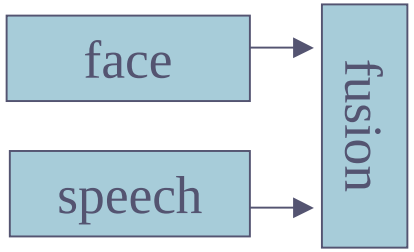
Score-level fusion



D4.1 (m15) & 4.2 (m16)

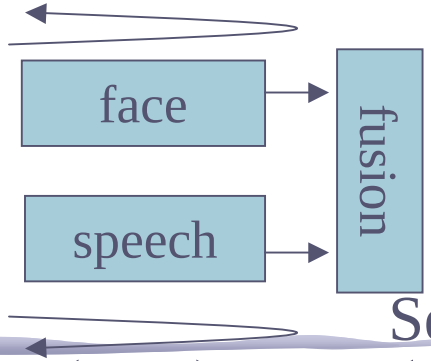
Advanced non-adaptive fusion

Feature/frame-level fusion



D4.3 (m24) & 4.4 (m30)

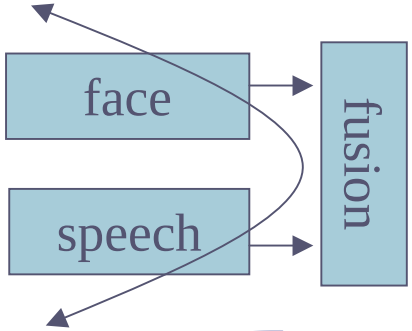
Baseline adaptive fusion



Self-train

D4.5 (m17) & 4.6 (m20)

Advanced adaptive fusion



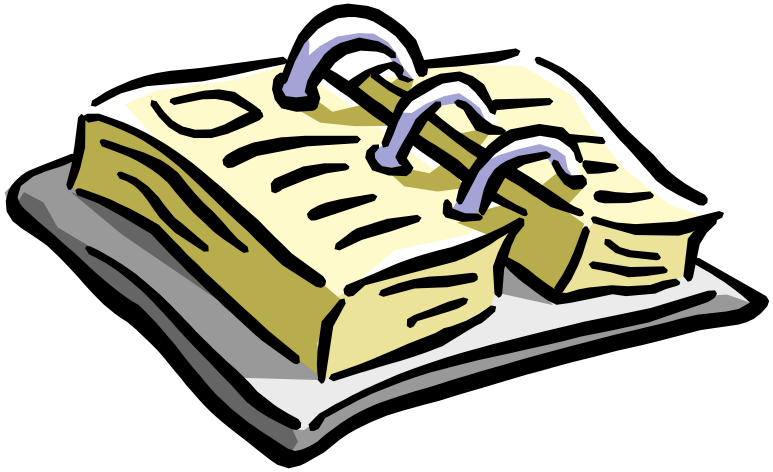
co-train

D4.7 (m26) & 4.8 (m30)

Discussion flow

- Quick recall to the BANCA database
  - Take what is good for Mobio!
- Adaptive BANCA protocols
- What tools do we needed?
  - Who does what?
- Revision on schedule?
- Adaptive MOBIO protocols

Schedule

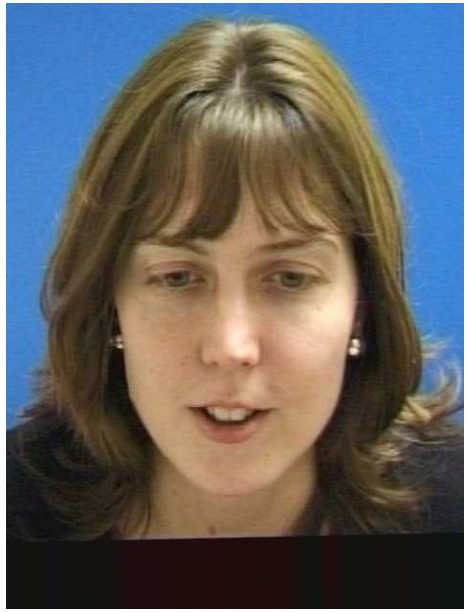


Database characteristics

- BANCA
  - (+) known environment types (control/clean, adverse, degraded)
  - (-) uninformed impostor attack
  - Only 52 subjects (g1+g2) [where are BANCA spanish, etc?]
  - (+) Two-fold cross-validation
  - (-) 4 consecutive sessions
  - Challenging for face but not for speech
  - (+) video-based
- MOBIO
  - (+) uninformed and (informed?) impostor attacks
  - (+/-) no control over recording environment (realistic)
  - (+) >100 subjects
  - (+) Good to have two-fold cross-validation
  - (+) 12 consecutive sessions
  - Challenging for face and possibly challenging for speech
  - (+) video-based
  - (+) lots of *automatic* annotations (facial alignment, face/speech quality measures)

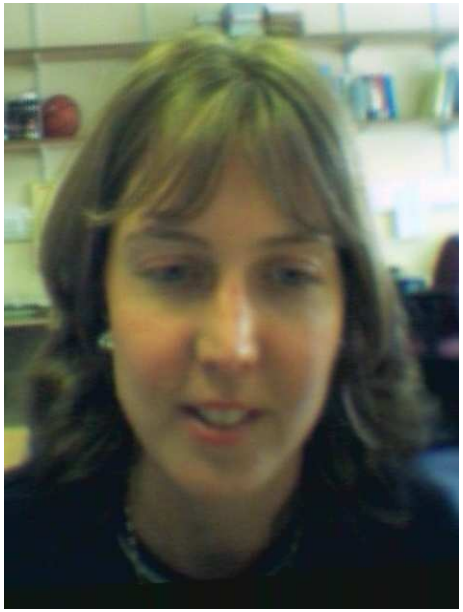
BANCA database

controlled



adversed

degraded



after having cropped the faces automatically

BANCA English: 26 males; 26 females
4 other language groups

Three scenarios

Scenario c (controlled)	Session	1		2		3		4	
	Records	T	I	T	I	T	I	T	I
Scenario d (degraded)	Session	5		6		7		8	
	Records	T	I	T	I	T	I	T	I
Scenario a (adverse)	Session	9		10		11		12	
	Records	T	I	T	I	T	I	T	I

Video-to-video matching

Template video (high quality)

matching

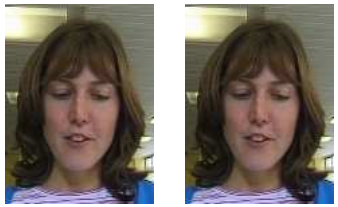
Match score

Query Video (adversed conditions)

Match vs Unmatch Scenarios

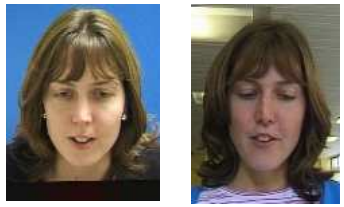
Matched control (Mc)

Matched adverse (Ma)

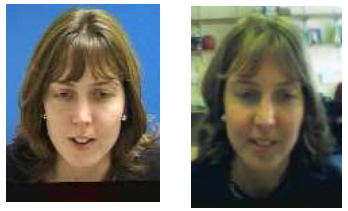


Matched degraded (Md)

Unmatched adverse (Ua)



Unmatched degraded (Ud)



Experimental protocols

Test Sessions	Train Sessions			
	1	5	9	1,5,9
C: 2-4 I: 1-4	Mc			
C: 6-8 I: 5-8	Ud	Md		
C: 10-12 I: 9-12	Ua		Ma	
C: 2-4,6-8,10-12 I: 1-12	P			G

c=controlled d=degraded a=adverse

M=matched training and test scenarios

U=unmatched training and test scencarios

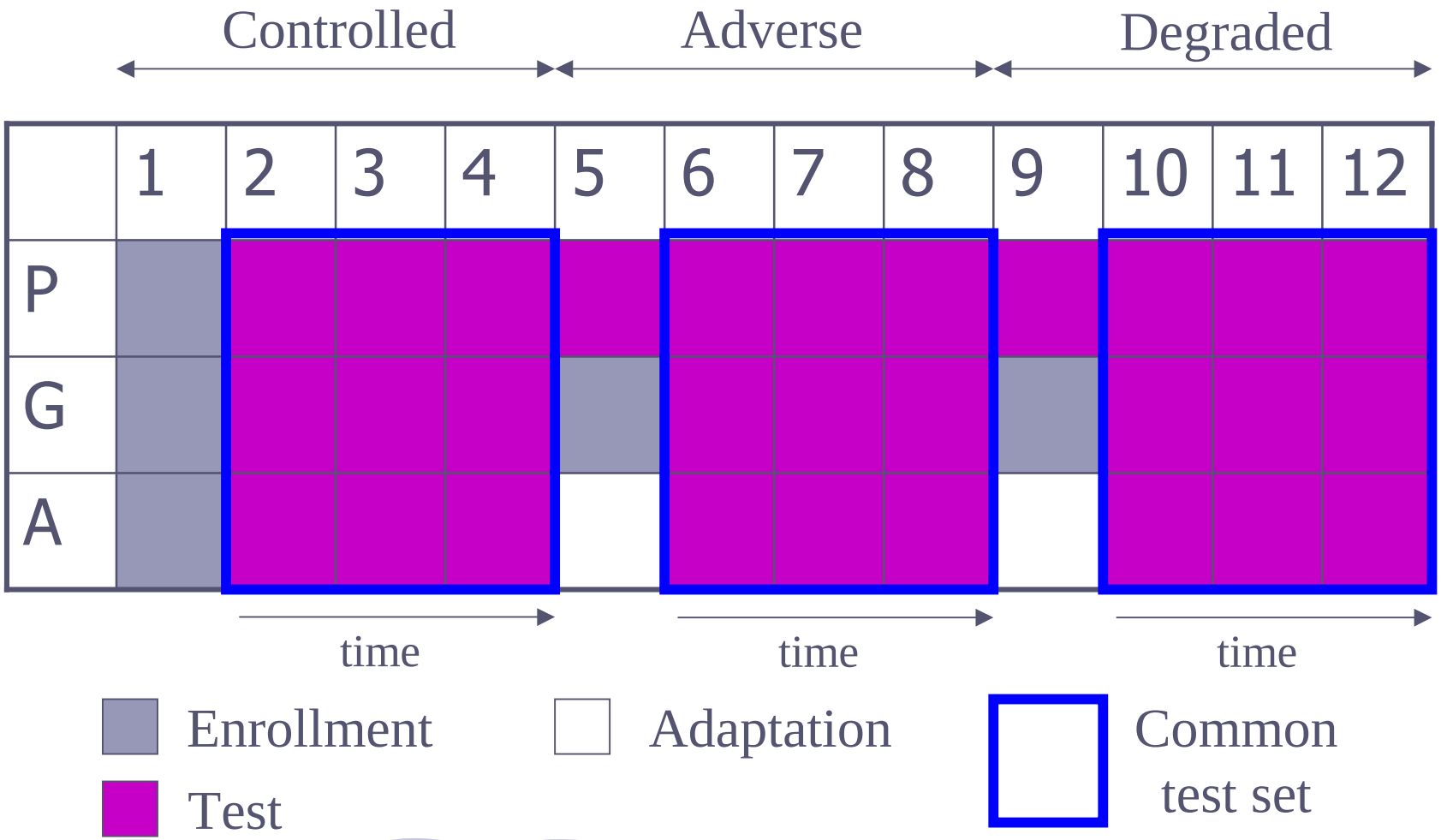
P=pooled experiments of Mc, Ua, Ud

G=grant total of Mc,Md and Ma

Adaptation depends on assumptions!

Protocol	Environment	Availability of enrolment data.	Thrd adaptation	Strategies
G	Known	Available	none	Adapt thrd (e.g., Cohort norm)
G-variant	Unknown	Available	none	Adapt thrd Infer environment
P-variant	Known	Unavailable	none	Adapt thrd Factor analysis/semi-sup
P	Unknown	Unavailable	none	Adapt thrd Factor analysis/semi-sup Infer environment

Proposed adaptive protocol



What we have decided:

- UNIS works with IDIAP to develop *supervised adaptation* vs baseline system protocol files (deadline 22 April)
- IDIAP will run the face systems with new protocol files (deadline 18 May)
- LIA will run the face systems with new protocol files (deadline 18 May)

Something to think about for the advanced adaptive systems

1. Blind factor analysis adaptation
2. Inference with several models
3. Identifying which models are useful for a particular query
4. Efficiency issue with multiple models

Check this paper:
http://personal.ee.surrey.ac.uk/Personal/Norman.Poh/data/norman_mobio_lncs.pdf

Possible Mobio protocols

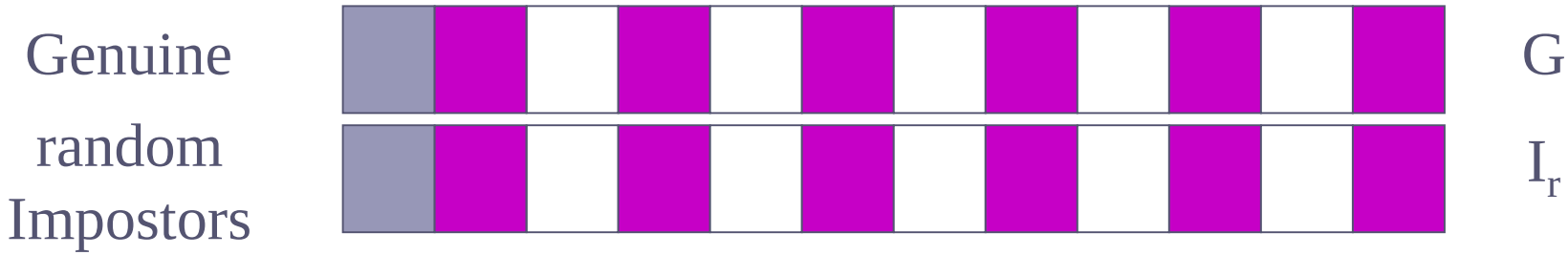
Proposal for Mobio

U protocol – Unmatched scenario (with notebook enrolment)

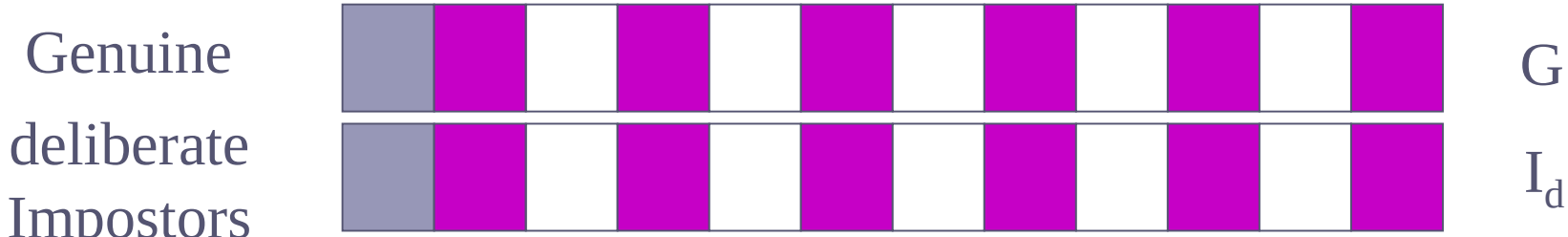
M protocol – Matched scenario (with mobile phone enrolment)

Protocols (cont')

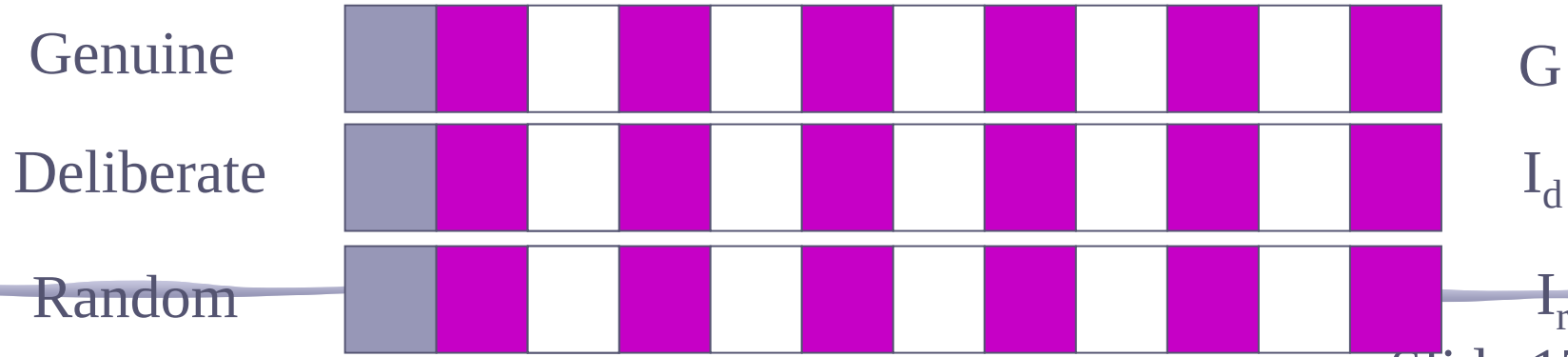
Mr or Ur protocols (r=random)



Md or Ud protocols (d=deliberate)



Mp or Up protocols (p=pooled)



Performance reporting

- Adaptive Success rate

- Verification rate

Variations on a protocol

- Order of presentation
  - Equally distributed