Puerto Rico

NIST 2006
University of Wales Swansea
(UWS)

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UWS Team

PhD students: **Benoît Fauve**
Neil Pearson

Supervisors: **John Mason**
Nick Evans

UWS Location

UWS NIST History

Persons	Year	System
Roland Auckenthaler	**2003**	**PhD - TNorm**
ditto	**2004**	**ditto**
Neil Pearson } PhD students	**2005**	**ditto + SMM software *Robert Stapert***
Benoit Fauve } PhD students	**2006**	**LIA/SPK_DET (Avignon) + SMM**

		Test Segment Condition			
		10 sec 2-chan	1 conv 2-chan	1 conv summed-chan	1 conv mic
Training Condition	10 seconds 2-channel	optional			
	1 conversation 2-channel	optional	required	optional	optional
	3 conversation 2-channel	optional	optional	optional	optional
	8 conversation 2-channel	optional	optional	optional	optional
	3 conversation summed-channel		optional	optional	

GMM Systems

2003 — Roland Auckenthaler (GMM)

2004 — Robert Stapert (SMM)

2005 — LIA/Spk_DET from Avignon (based on ALIZE)

2006

All standard :

cepstral features, GMM adaptation & TNorm

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System Parameters

- **Features**
  - LFCCs - SPro - IRISA (Rennes)
    - 50: 19 static + 19d + 11dd + dE
    - Except for 10s10s: 30/34
- **Models**
  - 2 independent GMM systems (LIA/SPK_Det + SMM)
  - Gender dependent
  - 512 - 2048
  - Mean only adaptation
  - Targeted TNorms, 100 – 200

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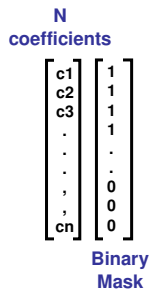
Feature Optimisation (1)

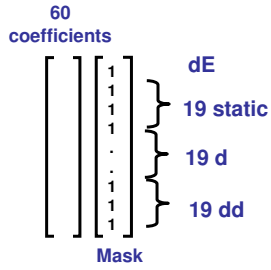
LIA/SpkDet has a very useful mask facility:



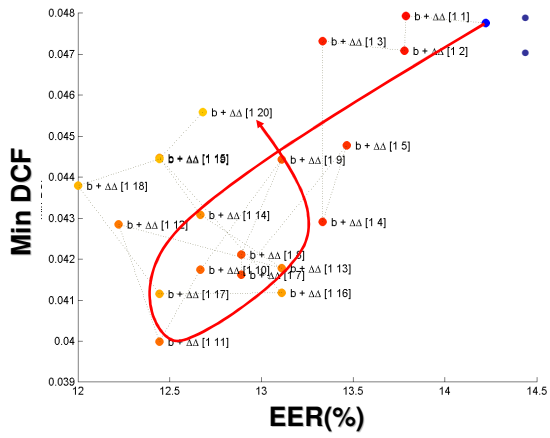
Feature Optimisation (2)

Strategy:

- **Start with N coefficients, eg: dE + 19static + 19d + 19dd**
- **Facilitate different combinations with a 1 - 0 mask**
- **And Search!**

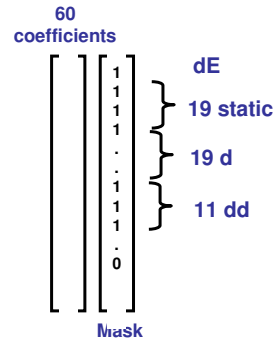


Feature Optimisation (3)

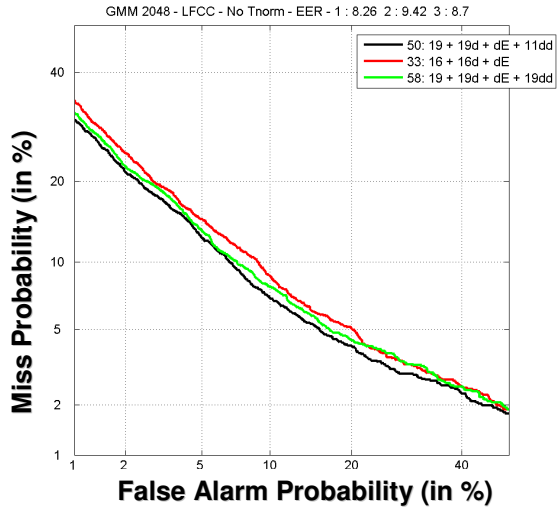


Simplest Strategy:

- **Start with 19 + 19d + dE: (b)**
- **Add double deltas 1 by 1**



Feature Optimisation (4)



Feature Optimisation (5)

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Training Condition	Test Segment Condition: 10 sec 2-chan	1 conv 2-chan	1 conv summed-chan	1 conv aux mic
10 seconds 2-channel	optional			
1 conversation 2-channel	optional	required	optional	optional
3 conversation 2-channel	optional	optional	optional	optional
8 conversation 2-channel	optional	optional	optional	optional
3 conversation summed-channel		optional	optional	

30/34

Training Condition	Test Segment Condition: 10 sec 2-chan	1 conv 2-chan	1 conv summed-chan	1 conv aux mic
10 seconds 2-channel	optional			
1 conversation 2-channel	optional	**required**	optional	optional
3 conversation 2-channel	optional	optional	optional	optional
8 conversation 2-channel	optional	optional	optional	optional
3 conversation summed-channel		optional	optional	

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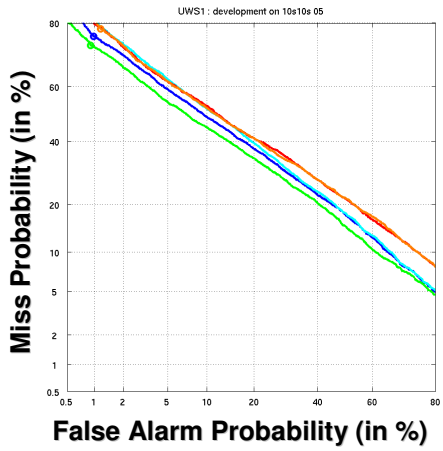
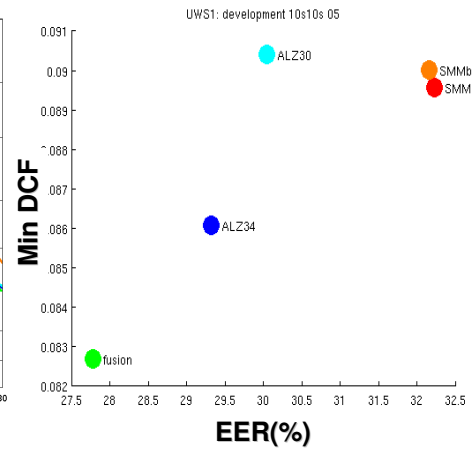
UWS Fusion Submission: 10s-10s





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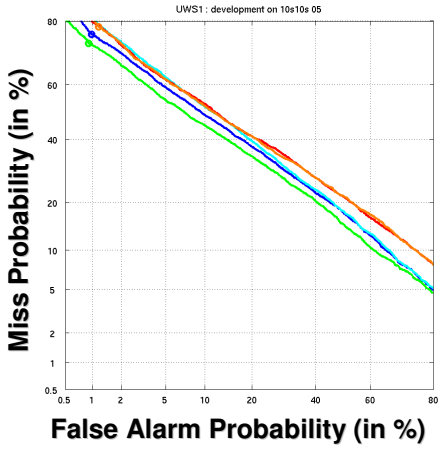
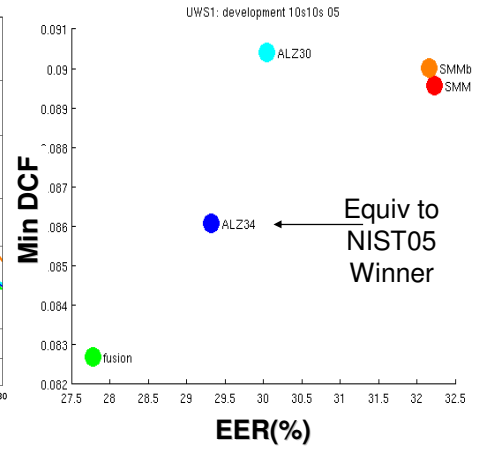
UWS Fusion Submission: 10s-10s





Post NIST 2006 Inter-Site Fusion

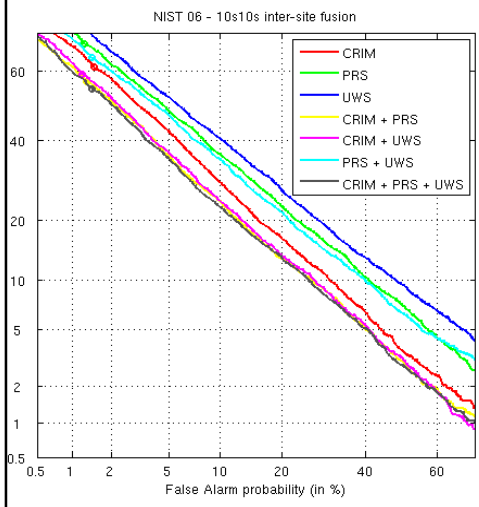
Post NIST 2006 Inter-Site Fusion

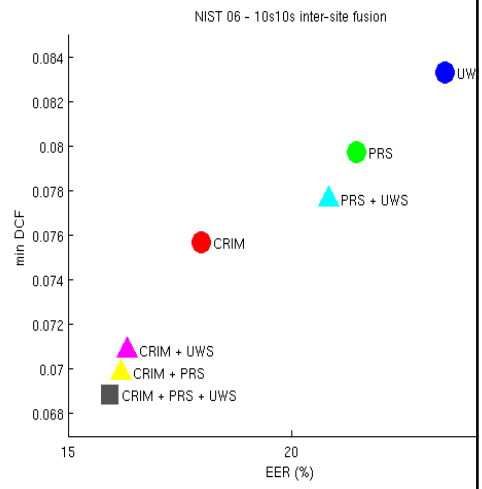
10s10s

CRIM + PRS + UWS

CRIM + PRS + UWS, 10s10s *post NIST 2006*

Fused with a plus!





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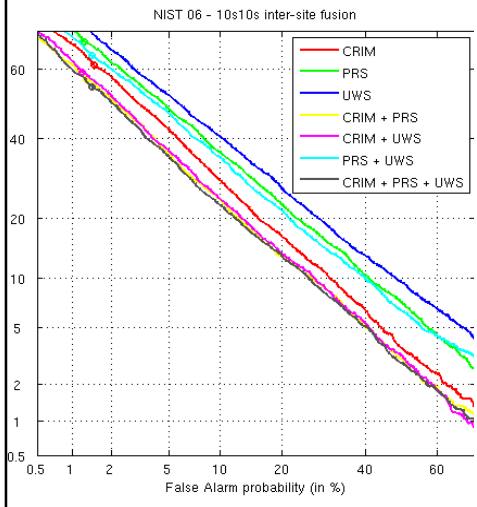
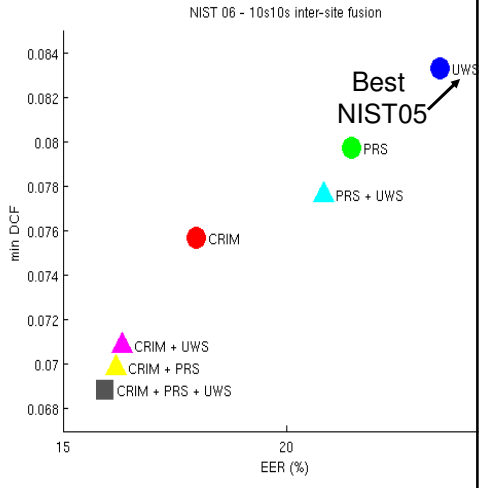
CRIM + PRS + UWS, 10s10s *post NIST 2006*

Fused with a plus!





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Comment and Outlook

- We hope to participate in 2007
- *Intra*-site fusion has worked for us
  - 3 standard GMM implementations
- *Inter*- site fusion is popular and successful so we are looking for partners
- And so if you can't get back to PR then try the beaches at …

UWS