University *of Ljubljana*
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Description of ULJ system for NIST SRE 2006

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Outline

- Our first submission
- One system: ULJ_1
- Core test only: 1conv4w-1conv4w
- Main objectives:
  - Verify correctness of our baseline GMM-based system
  - Learn what others are doing
  - Get new ideas

System configuration

- Gender-dependent
- 512 Gaussians per GMM
- 16 LFCCs with deltas + delta log energy
- Energy-based silence detection
- No score normalization

Frontend

- SPRO4 for feature extraction
  - 33 dimensional feature vectors
    (16 LFCC with deltas + delta log energy)
- LIA frontend for silence removal and MVN
  - GMM based energy detector (alpha = 0.0)

UBM training

- Gender-dependent models
- EM training
  - Mixture splitting (1,2,4, …, 512)
  - 20 iterations

Data for UBM

	Female sides	Male sides
Switchboard 2 Part 3	2631	2324
Switchboard Cellular 1	1022	1164
Switchboard Cellular 2	2011	1629
NIST 2004	2208	1909
Σ	7872*	7026**

* 111 hours of speech after silence removal

** 99 hours of speech after silence removal

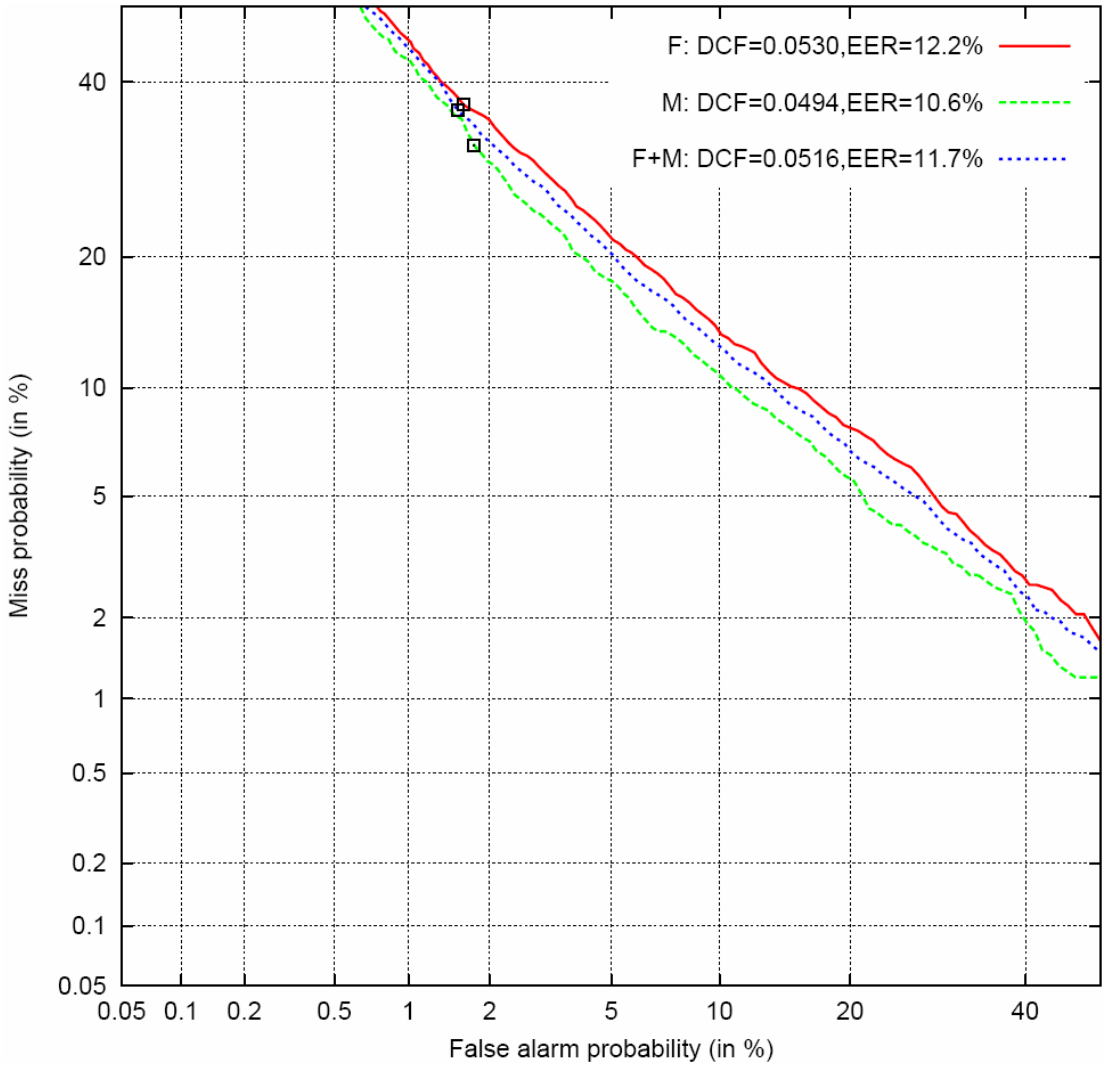
Speaker modeling

- MAP adaptation of UBM model
  - 10 iterations
- Means only
  - Relevance factor 16

Scoring

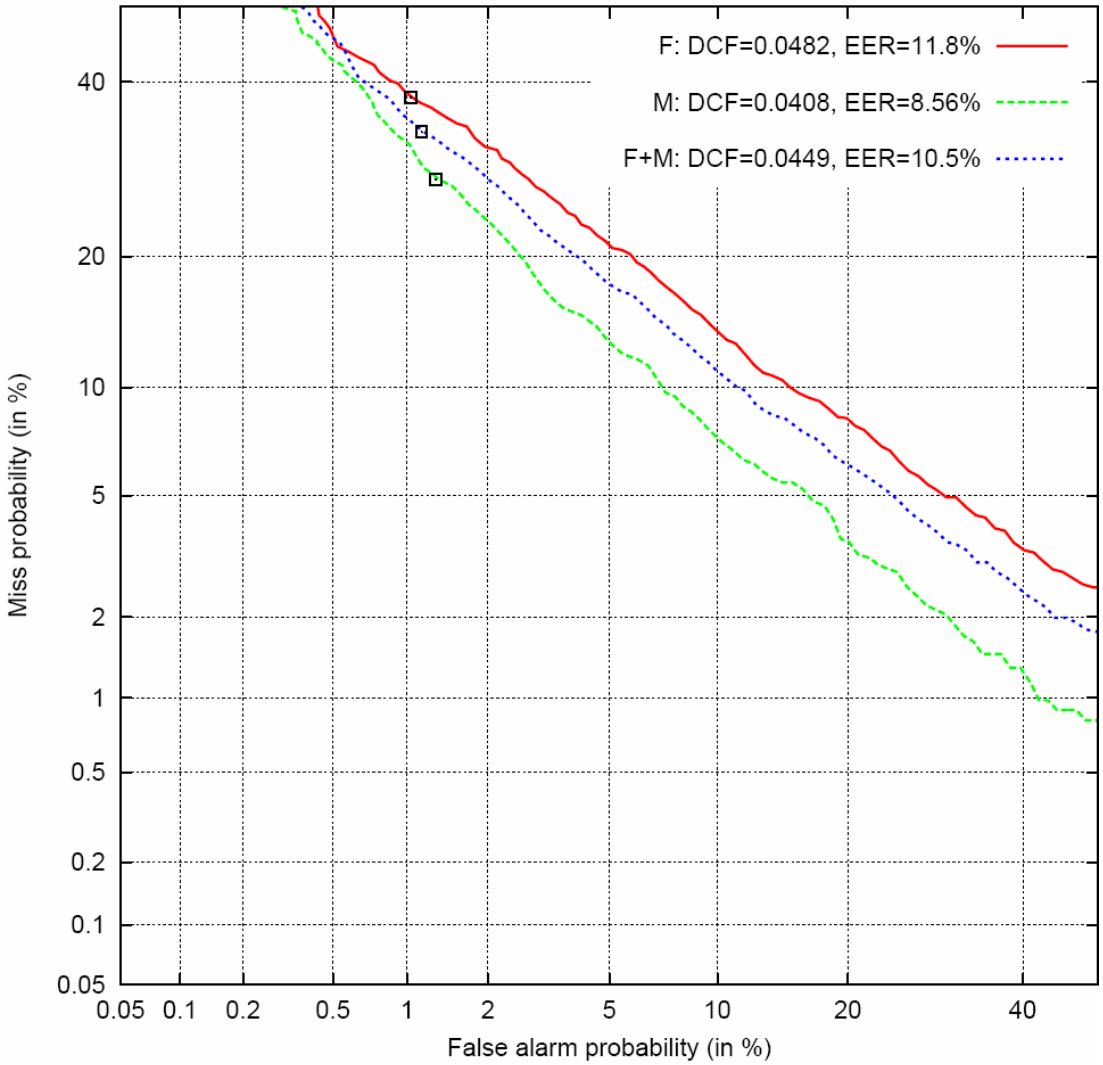
- Scores based on log-likelihood ratios
  - without normalization
- Decision
  - Gender-dependent thresholds tuned on NIST 2005 data

Official results (all trials)



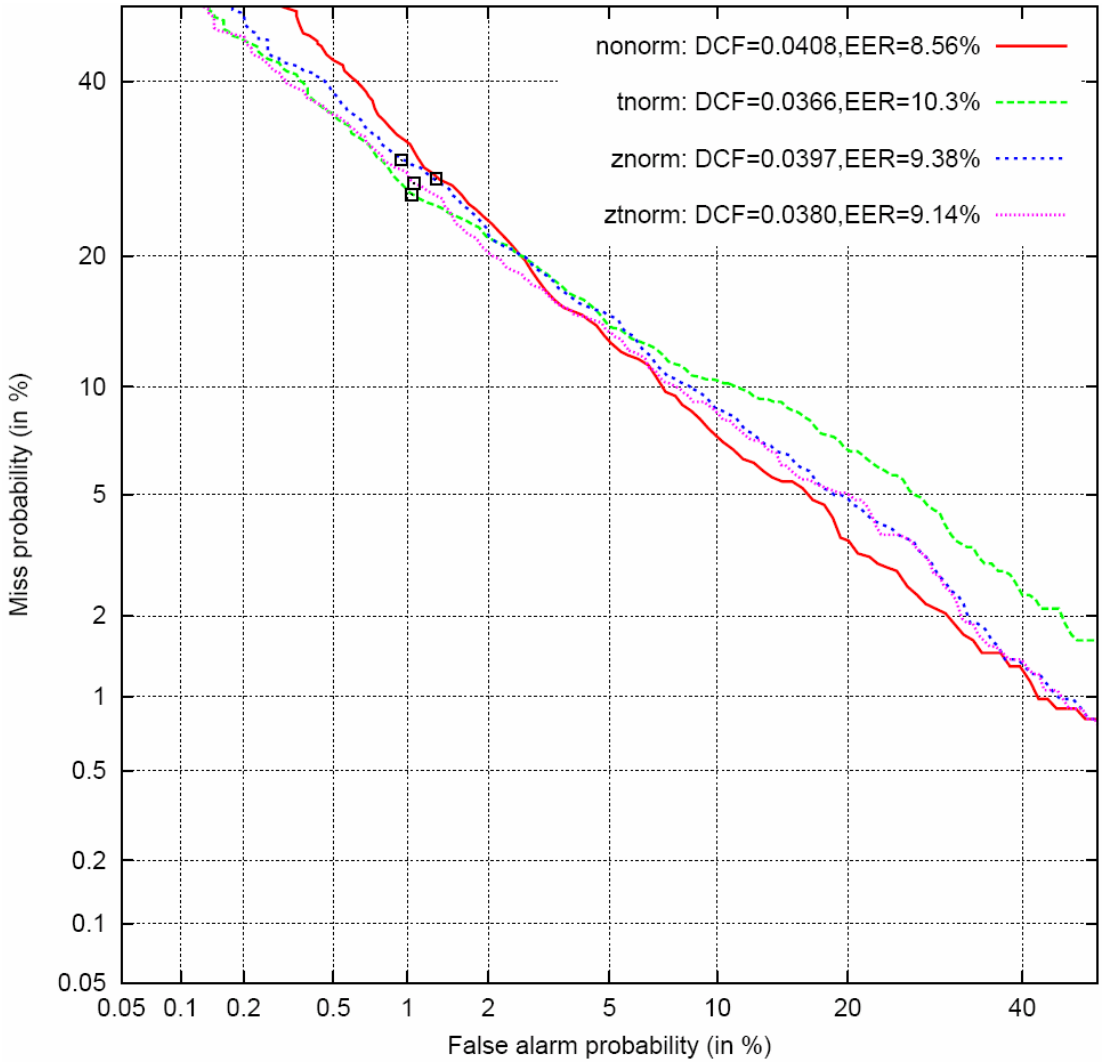
- core test
- actual decision cost for F+M = 0.557

NIST 2005 results



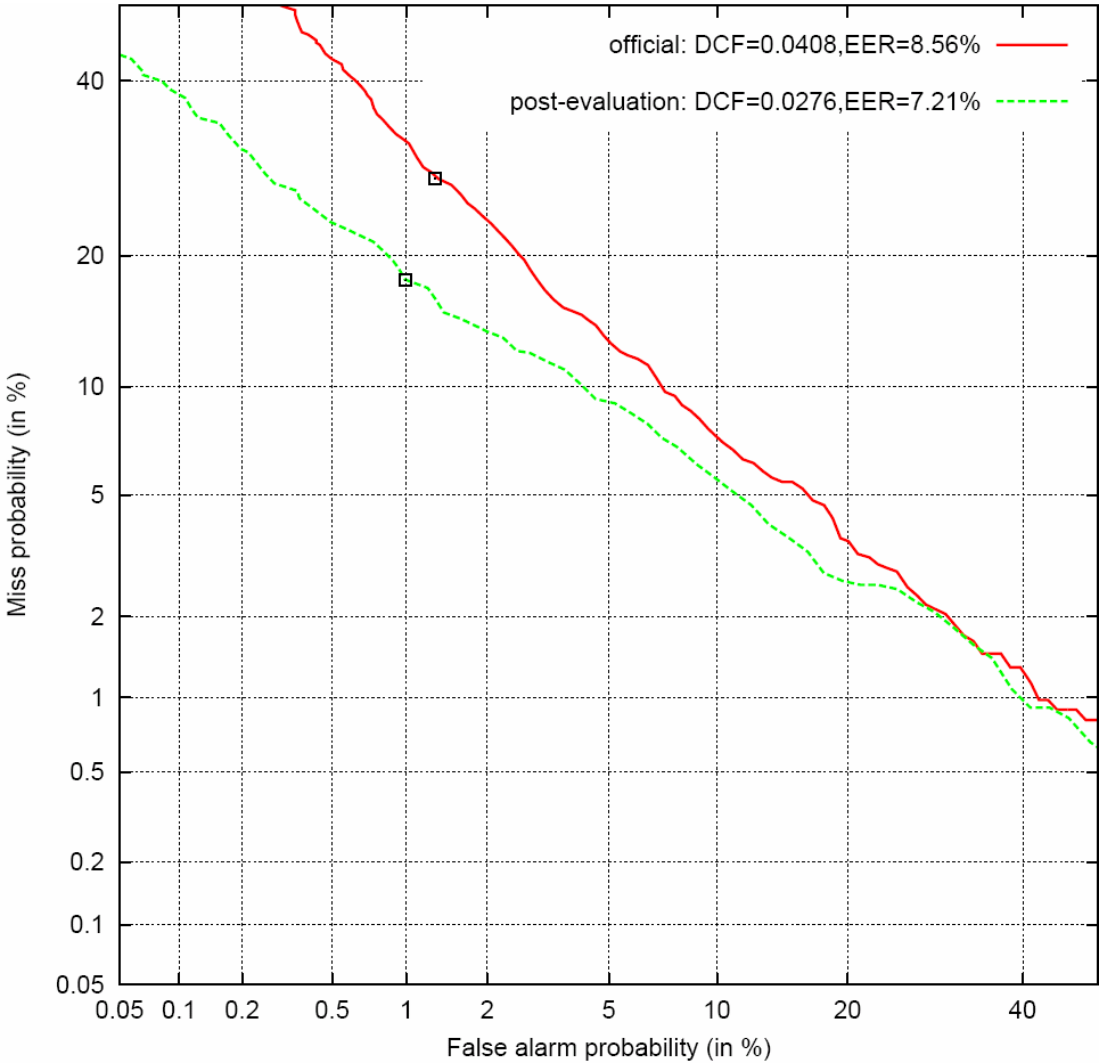
- bigger difference between male and female results

NIST 2005 results



- male part of NIST 2005 (core test)
- score normalization brings only small performance improvement ?

Post-evaluation results



- male part of NIST 2005 (core test)

Work in progress

- Check correctness of ZT-norm implementation
- Channel normalization
- SVM-based scoring
- Speaker dependent thresholds