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THALES COMMUNICATIONS-LIA
NIST SRE 06 Submission

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date / references

n **NIST SRE 2006 Evaluation : System description**

 n **Classical GMM-UBM system including:**

  l UMB Universal background Model:

   l 2048 Gaussians

   l Data: NIST 03 and NIST 04, 600 speakers, 300 male and 300 females,

   l Learning by classical EM Algorithm

  l Client learning:

   l Adaptation from MAP algorithm adaptation from Universal Background by MAP algorithm

  l Scoring phase

   l The 10 top Gaussians form UBM and target model are used

  l Score Normalisation:

   l T-NORM: 380 impostors

   l Data NIST 03 et NIST 04, 160 males and 160 females

  l Acoustic parameters normalisation:

   l Classical cepstral mean suppression and variance normalisation

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n **Acoustic Parameters**

   n ESTI Standard AURORA-2 including:

      l MFCC parameters extraction,

      l Noise reduction stage,

      l Blind channel equalisation stage (acoustic parameters normalisation)

      Ł Compression stage turned off

   n Acoustic vector used:

      l 20 MFCC, 20 Δ MFCC, 20 Δ Δ MFCC, Δ log E, Δ Δ logE: 62 coefficients every 10 ms
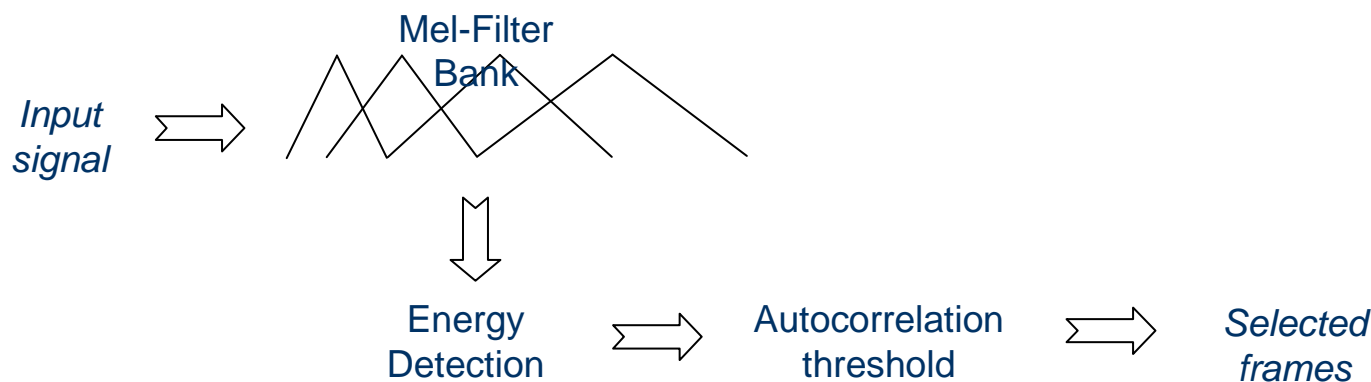
n **Statistic Tools**

   n Collaboration with LIA: Toolkit ALIZE and LiaSpeakerDet 05 tools

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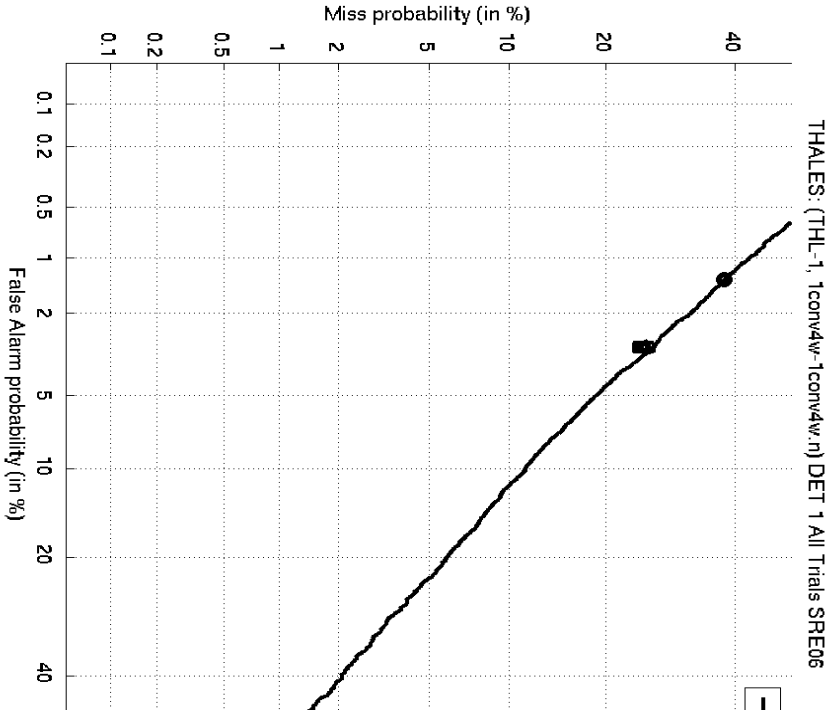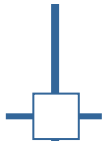Laboratoire d'Informatique
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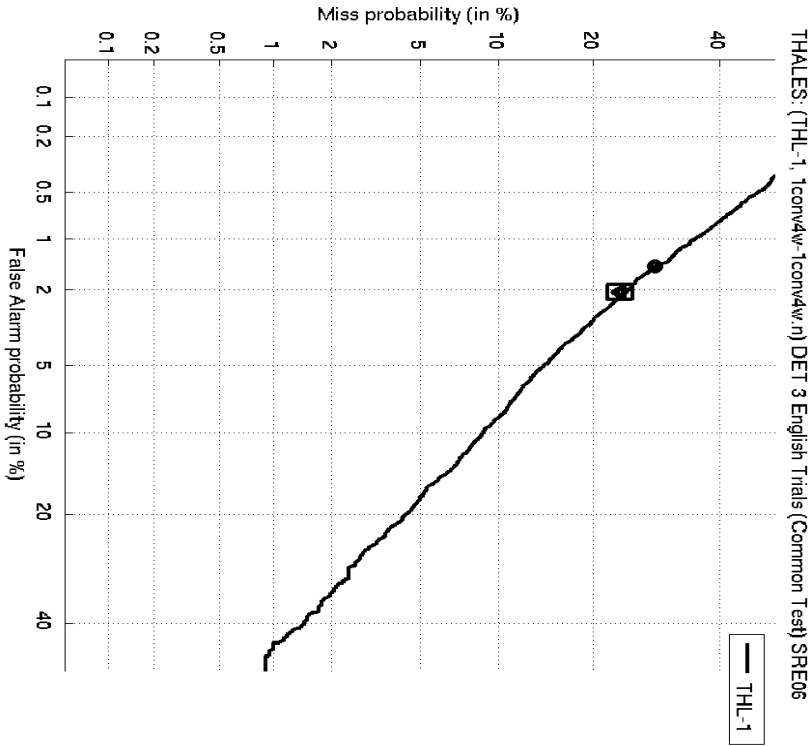## n Description of the frame selection process

- n **Sub-band energy detection for pre-selection**
    - l GMM modelling of sub-band energy distributions
        - l 4 Mel-spaced sub-bands
        - l 3 Gaussians per sub-band

- n **Autocorrelation coefficient**
    - l Post-processing of pre-selected frames focusing on **voiced** frames
    - l Autocorrelation coefficient is maximised on candidate pitch lags in the range of 60 Hz to 400 Hz

- n **Percentage of frames**
    - l On NIST evaluation data less than 30 % of frames are selected

Input signal ⟹ Mel-Filter Bank ⟹ Energy Detection ⟹ Autocorrelation threshold ⟹ *Selected frames*

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n   DCF min DET1: 0,54

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Miss probability (in %)

False Alarm probability (in %)

THL-1

n   DCF min DET3: 0,45

THALES: (THL-1, 1conv4w-1conv4w-.n) DET 3 English Trials (Common Test) SRE06

Miss probability (in %)

False Alarm probability (in %)

THL-1

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Some future experiments:

n Robust extraction of acoustic features

n Distributed architecture for Speaker Verification (DSV)

  n Evaluation of AURORA 2 compression module

  n Evaluation of new compression schemes

n Targeted applications

  n Professional network monitoring (specific allocated bit-rate)

  n Secured-access to server-based applications

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