

ASR Lab Results

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Overview

- ▶ **Testing Environment**
- ▶ **Gaussian Mixture Model (GMM) Tuning**
 - ▷ **Expectation-Maximization (EM) Parameters**
 - ▷ **Alignment Parameters**
 - ▷ **Search Results**
- ▶ **Neural Network (NN) Tuning**
 - ▷ **Write stuff here**
 - ▷ **Search Results**

Testing Environment

Hardware:

- ▶ Intel i5-4690K @ 3.5GHz, Quad Core, SSE2 registers
- ▶ 16GB DDR3 1333MHz RAM

Parallelization with OpenMP:

- ▶ In search
- ▶ In neural network operations

GMM Tuning: EM Parameters

Basic setup:

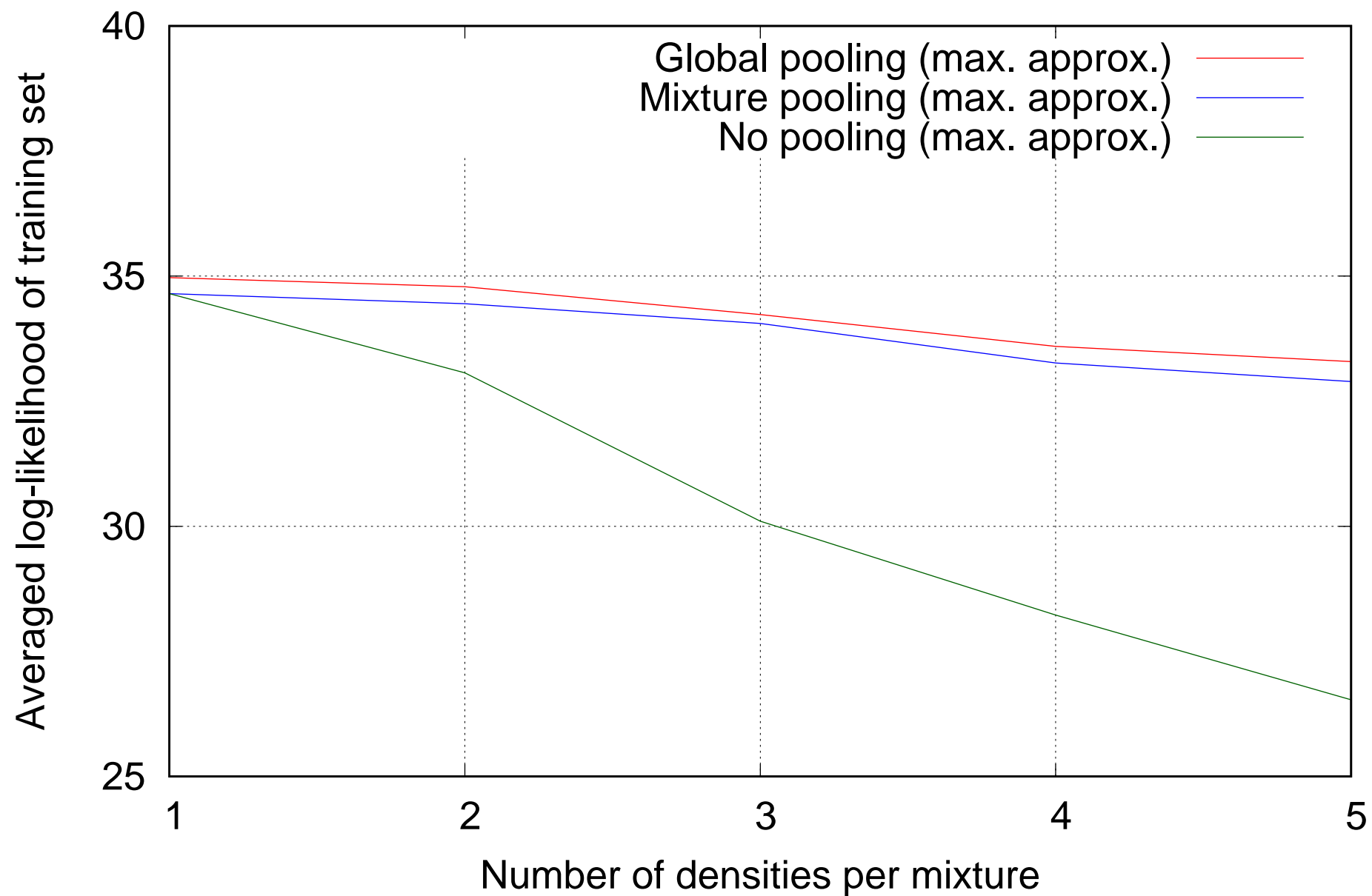
- ▶ Lexicon consists of 106 states
- ▶ Exact computation of the linear segmentation
- ▶ 6 EM steps
- ▶ 4 density splits

Tunable properties:

- ▶ Minimum observations per density
- ▶ Pooling type
- ▶ Maximum approximation vs. sum approach

Tuning is based on the likelihood of the training data

Log-likelihood of GMM models with expectation-maximization



GMM Tuning: EM Parameters

Pooling:

- ▶ No pooling results in better model fitting than using pooling
- ▶ Global and mixture-level pooling perform similarly

Splitting criterion:

- ▶ Minimum number of observations per density has a small influence
- ▶ Sufficient data points per density in a mixture due to:
 - ▷ At most 5 densities per mixture
 - ▷ Each density has, in average, 7K data points.

Mixture approximation:

- ▶ Better results when using the maximum approximation

Last week

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Thank you for your attention

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