# WEEK 9 REPORT

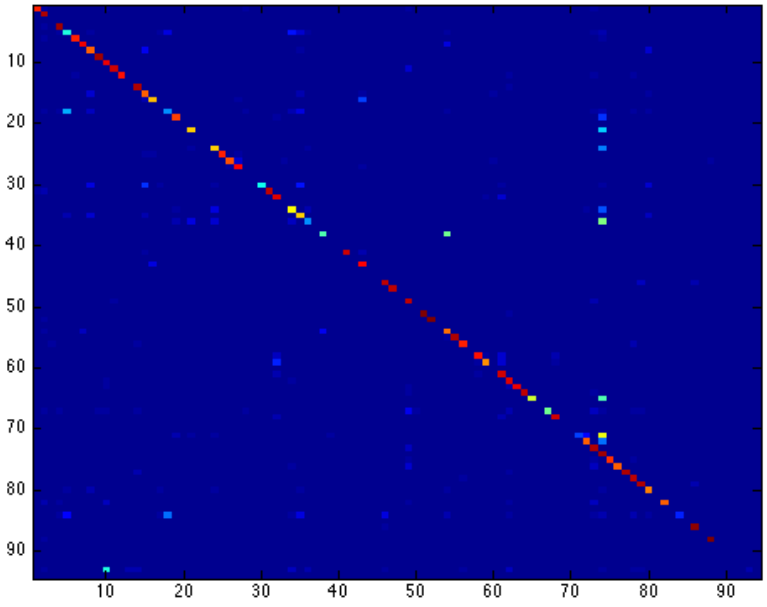
## Sports Video Summarization

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Christian Weigandt
Levi Smith

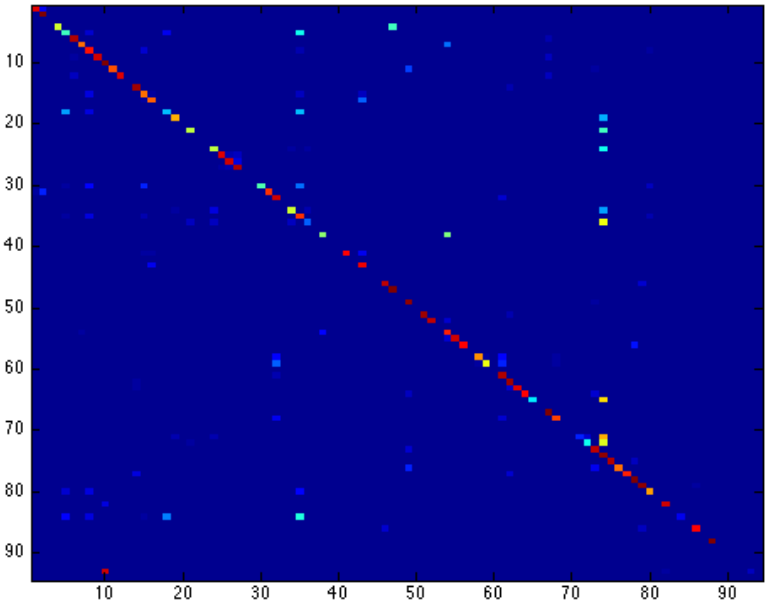
# Confusion Matrices

- Testing on EC11 MBH features

baseline



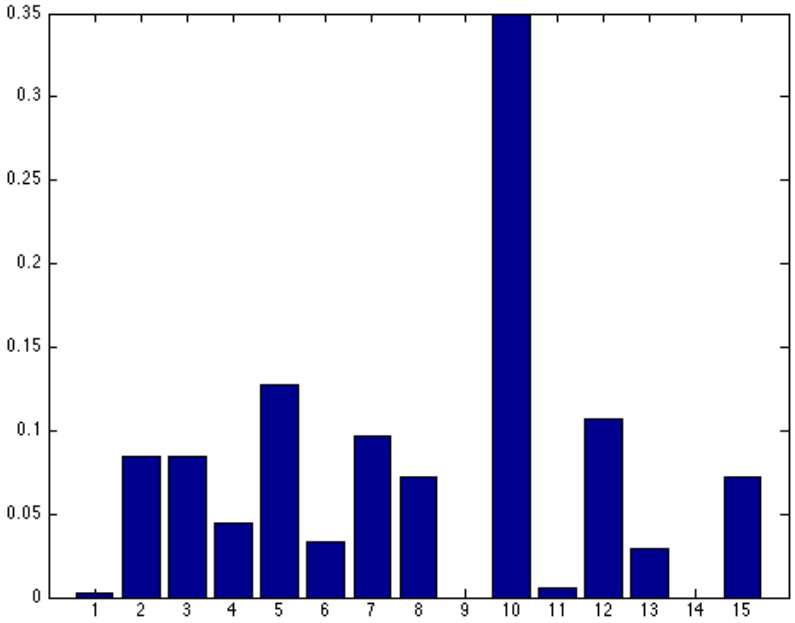

our method



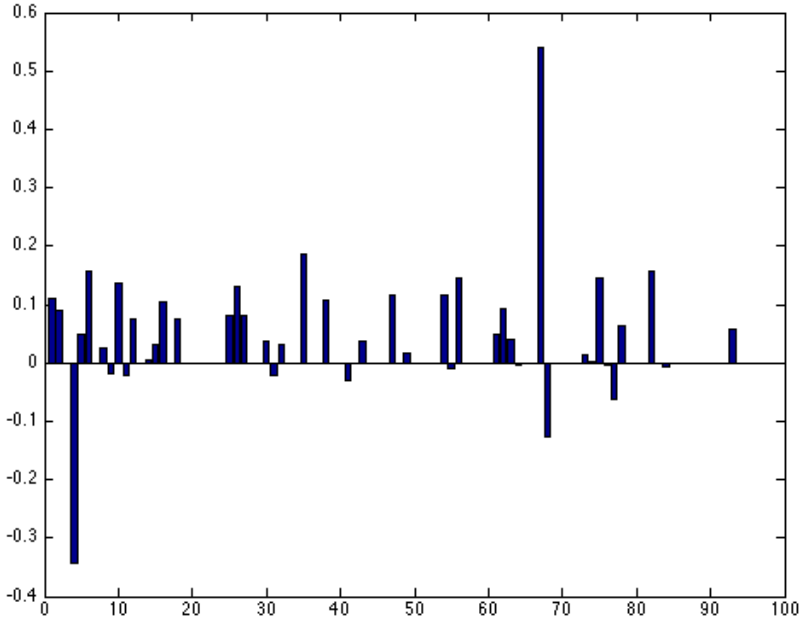
# Concept Classification

- Annotations created with 0.8 overlap threshold

Average improvement per event: 7.46%



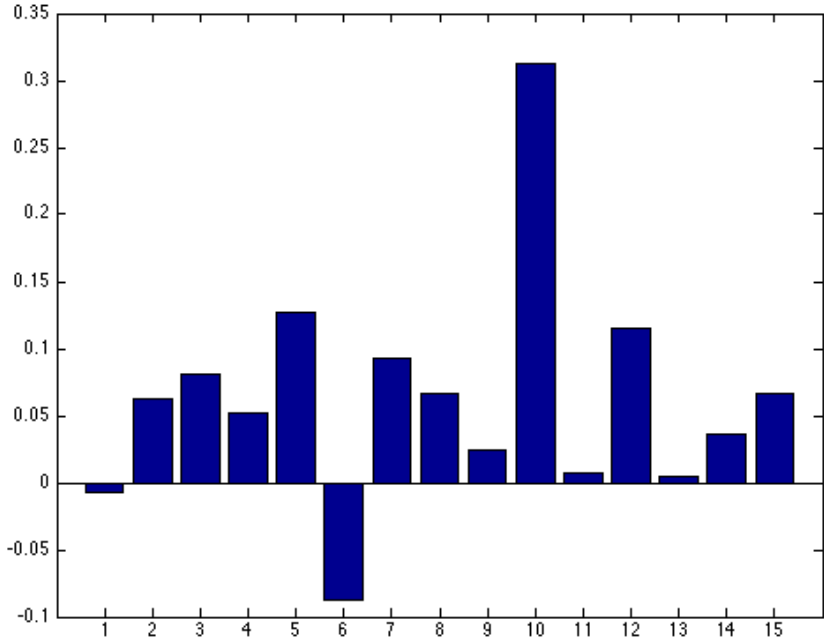

Average improvement: 4.46%



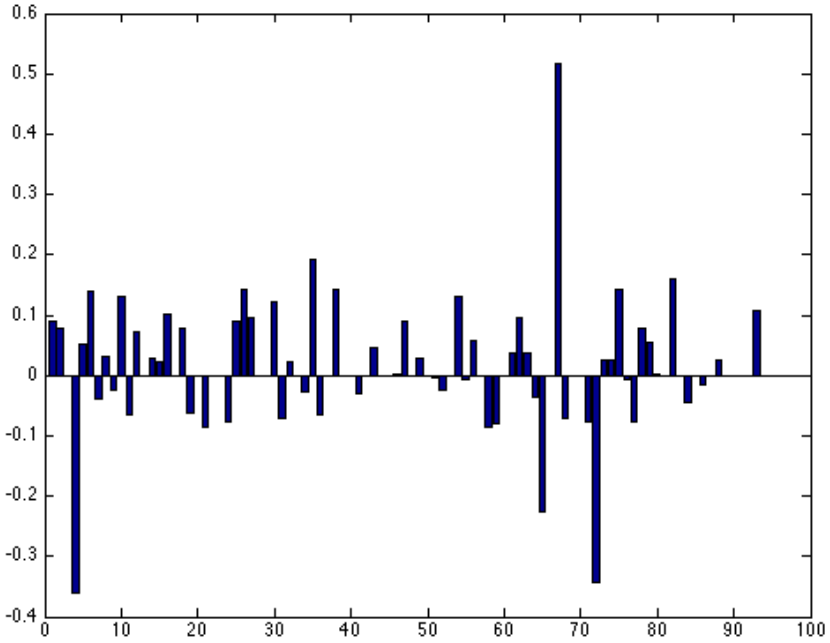
# Concept Classification

- Annotations created with 0.3 overlap threshold

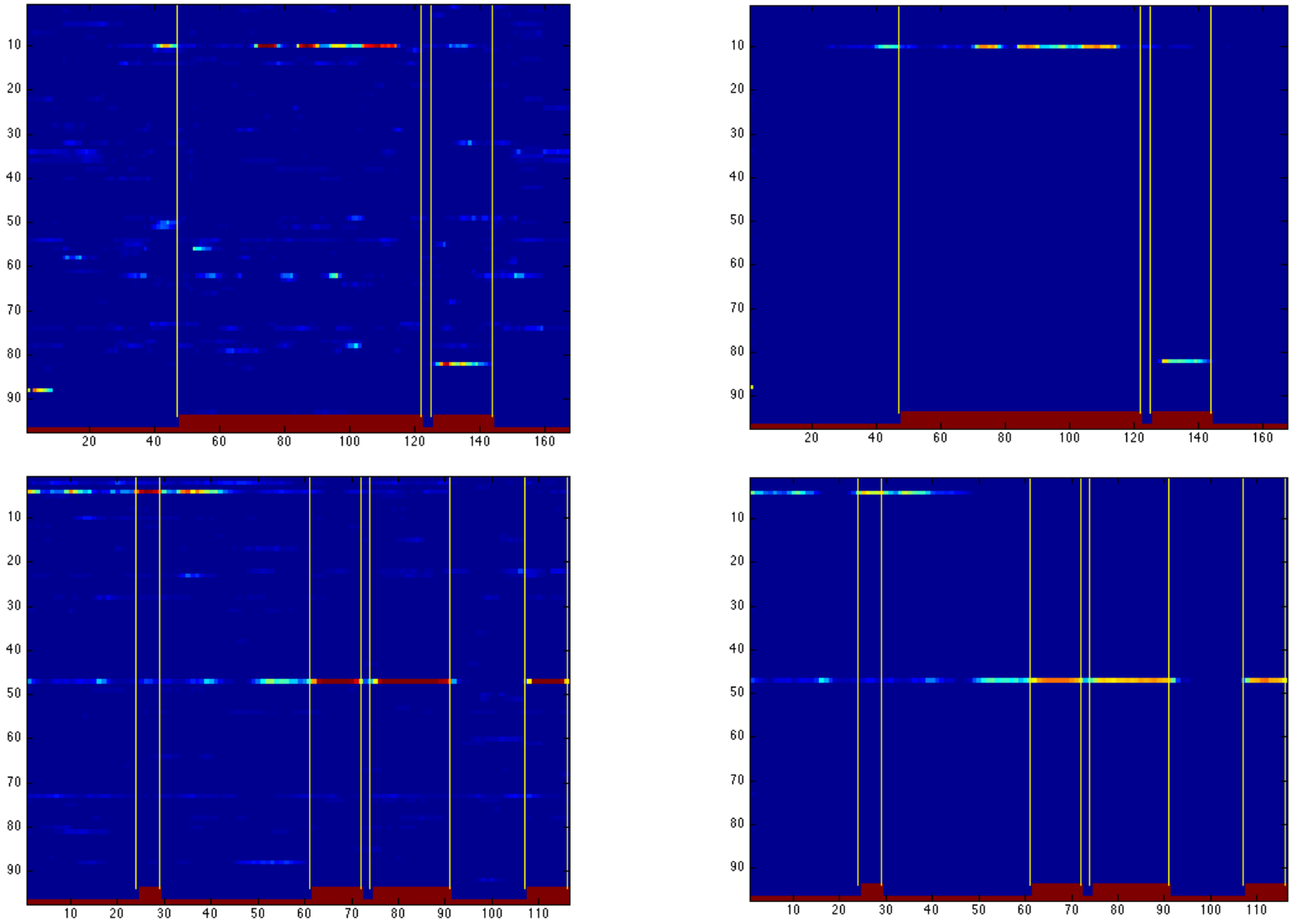
Average improvement per event: 6.35%




Average improvement: 2.07%



# Concept Detection



# Non-Action Detection

- Detecting non-action clips by summing up the probabilities for all concepts in a clip and applying a threshold on that sum
- Trying to take advantage of the confusion between actions in SVM probabilities
- Several probabilities are higher, so the overall sum will be greater than those without actions

# Non-Action Detection Results

Summary of Data

| | |
|---|---|
| Total Clips | 191,927 |
| Non-Actions | 114,709 |

EC11 Annotations  Threshold on Sum of Probabilities

| Threshold | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 |
|---|---|---|---|---|---|---|
| accuracy | 0.4263 | 0.5077 | 0.6 | 0.6688 | 0.7113 | 0.734 |
| false pos | 109,401 | 90,081 | 66,823 | 47,928 | 34,468 | 25,350 |
| false neg | 698 | 4,401 | 9,952 | 15,632 | 20,941 | 25,703 |
| % false pos | 57.00% | 46.94% | 34.82% | 24.97% | 17.96% | 13.21% |
| % false neg | 0.36% | 2.29% | 5.19% | 8.14% | 10.91% | 13.39% |
| % removed | 4.63% | 21.47% | 41.75% | 58.22% | 69.95% | 77.90% |

Gaussian Fit Method

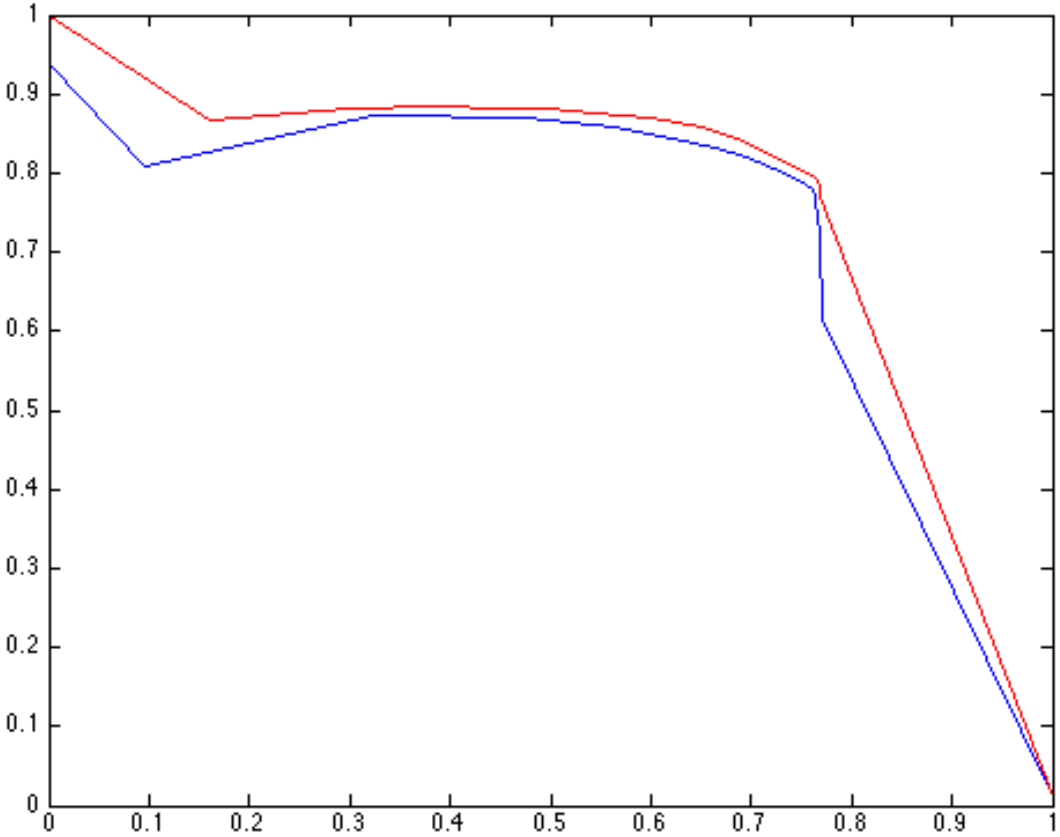
| Threshold | 2-3 sigma |
|---|---|
| accuracy | 0.7651 |
| false pos | 14,043 |
| false neg | 31,044 |
| % false pos | 7.32% |
| % false neg | 16.17% |
| % removed | 87.76% |

One Minus Max SVM

| | |
|---|---|
| accuracy | 0.7659 |
| false pos | 14,138 |
| false neg | 30,795 |
| % false pos | 7.37% |
| % false neg | 16.05% |
| % removed | 87.67% |

# Precision Recall for Concept Detection

ISA features



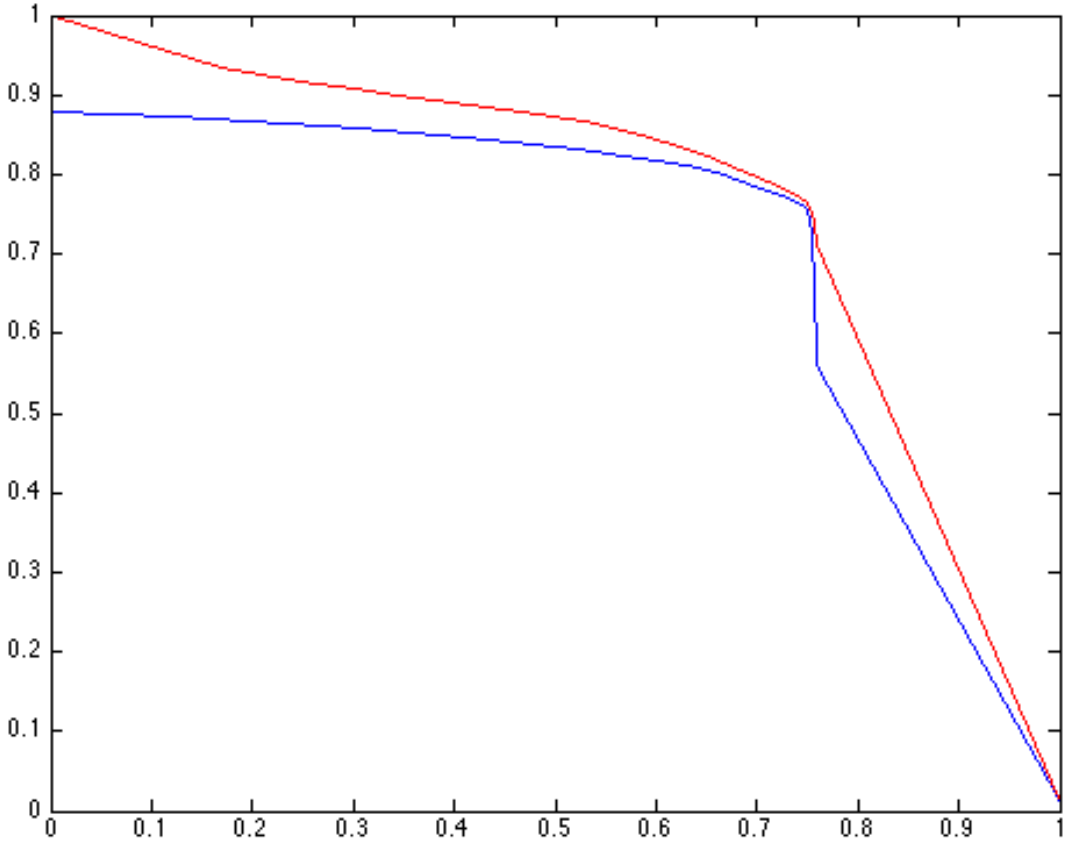

Mean Average Precision

Our method: 80.03%

Baseline: 75.93%

# Precision Recall for Concept Detection

MBH features




Mean Average Precision

Our method: 79.47%

Baseline: 73.63%

# Conditional Random Fields

- Looking into chain CRF as a possible alternative to our method
- Model used to predict a sequence which takes context (conditional probability) into account
- Causality applies better to a CRF than an HMM due to the conditional vs. joint distribution

# Currently

- Improving concept detection
- Event classification
- Implementing CRF