

# Report Meeting Week 5

Benjamin Mears

- Week's Progress
- KeyFrame extraction
- Where to next?

# Week's Progress

- Implemented SVM
  - Histogram intersection kernel
  - Improved results vs logistic regression
- Keyframe extraction algorithm
  - From "Online, Simultaneous Shot Boundary Detection and Key Frame Extraction For Sports Videos Using Rank Tracing"-Wael Abd-Almageed

# Basic Idea of Algorithm

- Step 1: Extract frames and convert to HSV colorspace
- Step 2: Create histogram of HSV values for each frame.
- Step 3: Concatenate into a matrix  $X^T$

$$X^T = \begin{bmatrix} x^1 \\ x^2 \\ x^3 \\ \vdots \end{bmatrix} = \begin{bmatrix} \text{histogram for frame 1} \\ \text{histogram for frame 2} \\ \text{histogram for frame 3} \\ \vdots \end{bmatrix}$$

# Basic Idea of Algorithm (Cont.)

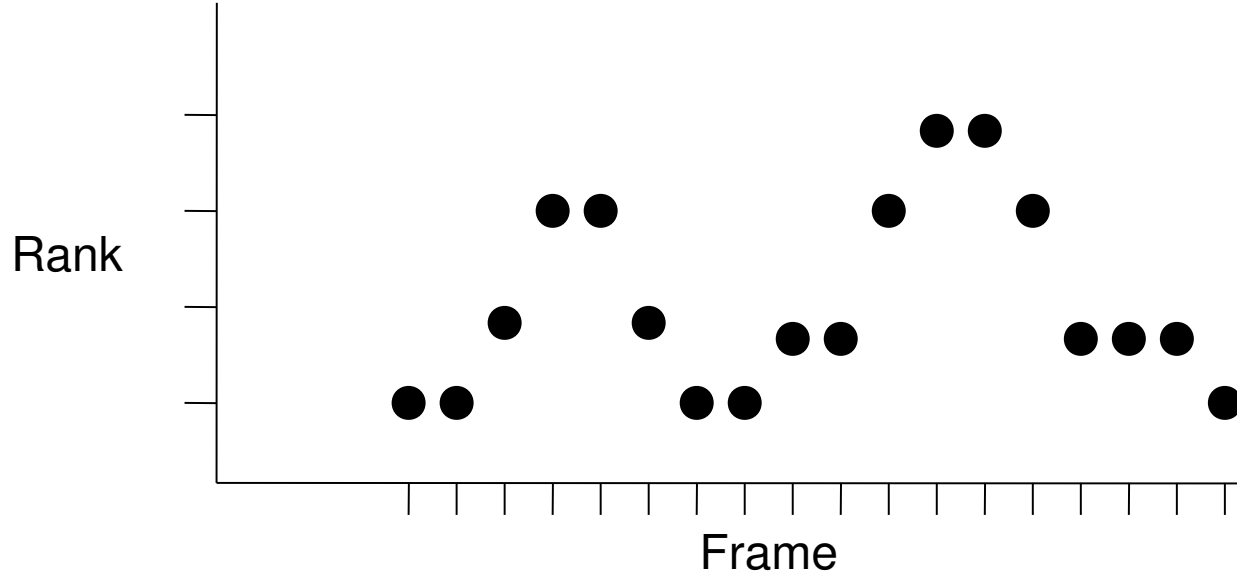
- For each frame, take a submatrix of  $X^T$ , consisting of  $x^f$ , along with the previous  $N-1$  rows:

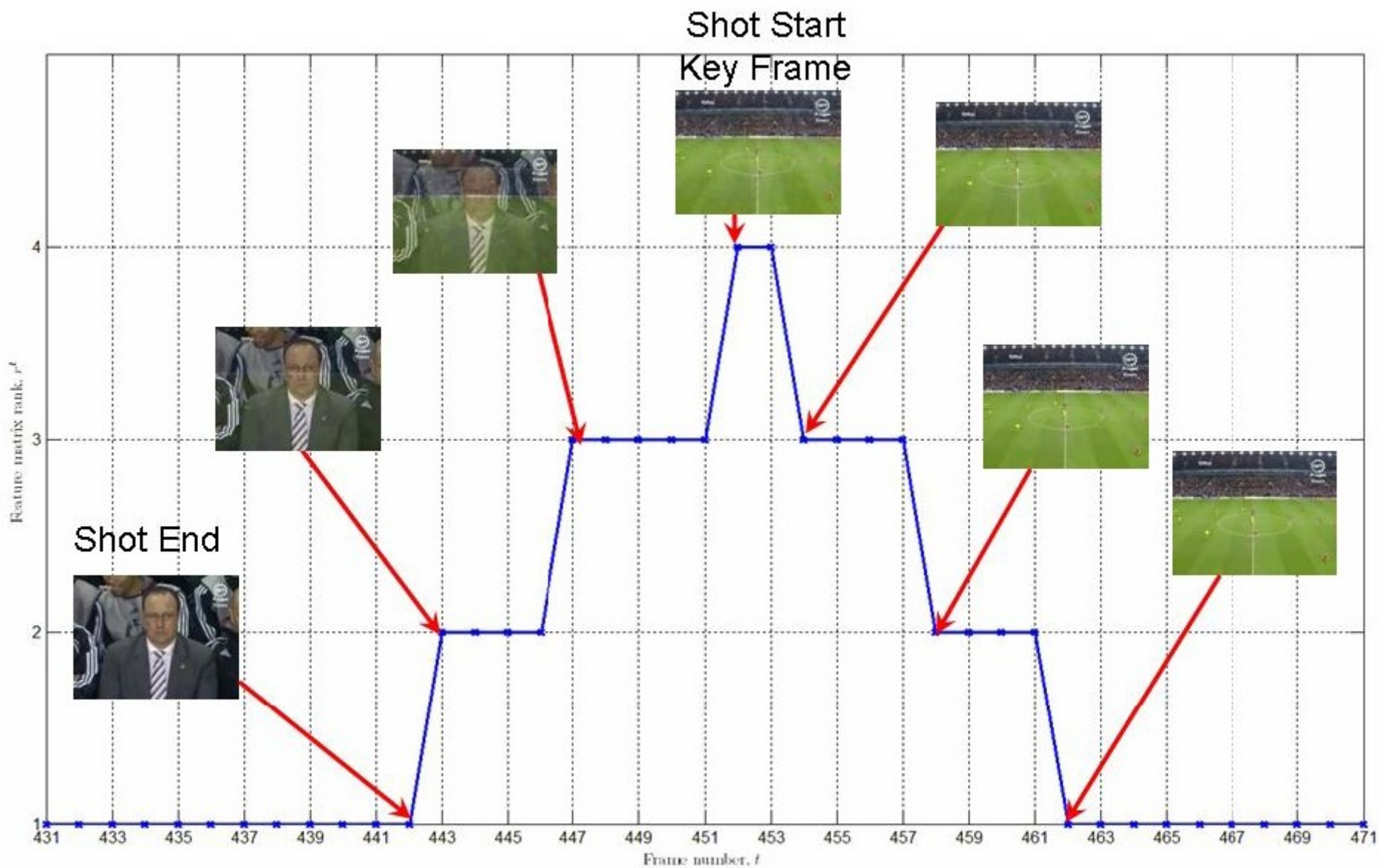
$$\begin{bmatrix} x^{f-N+1} \\ \vdots \\ x^{f-1} \\ x^f \end{bmatrix} = \begin{bmatrix} \text{histogram for frame } f - N + 1 \\ \vdots \\ \text{histogram for frame } f - 1 \\ \text{histogram for frame } f \end{bmatrix}$$

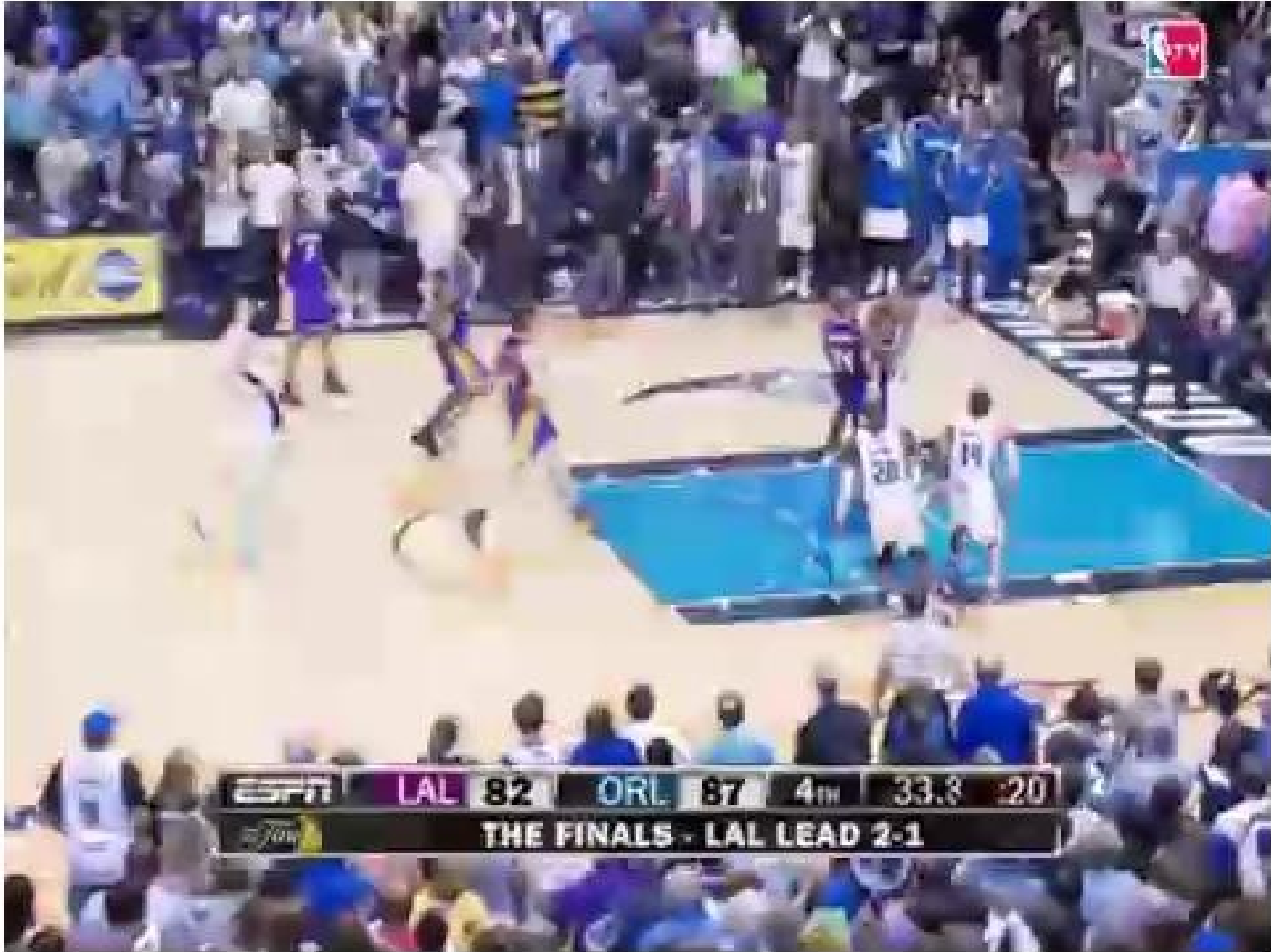
- Take the singular value decomposition of this matrix and use it to estimate the rank

# The Scanning Window...

Frame 1 Histogram	Frame 2 Histogram	Frame 3 Histogram	Frame 4 Histogram			Frame 8 Histogram	Frame 9 Histogram	Frame 10 Histogram	Frame 11 Histogram	Frame 12 Histogram	Frame 13 Histogram	Frame 14 Histogram	Frame 15 Histogram	Frame 16 Histogram	Frame 17 Histogram	Frame 18 Histogram	Frame 19 Histogram	Frame 20 Histogram	Frame 21 Histogram	Frame 22 Histogram	Frame 23 Histogram	Frame 24 Histogram	Frame 25 Histogram	Frame 26 Histogram	Frame 27 Histogram	Frame 28 Histogram	Frame 29 Histogram	Frame 30 Histogram	Frame 31 Histogram
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THE FINALS - LAL LEAD 2-1



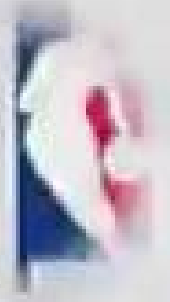












# Next Week's Goal Plans

- Finish integrating LIBSVM
- Begin exploring optical flow in OpenCV
- Look for ideas while at CVPR that may help our system
  - Begin brainstorming novel ideas to use