

MATCHING MOTION DESCRIPTORS FOR SHORT TERM ACTION RECOGNITION

Robert B. Fisher
School of Informatics
University of Edinburgh

MATCHING DESCRIPTORS I

Start with single frame matching

$$m(i, j) = \sum_{c=1}^4 \sum_{x,y \in I} a_c^i(x, y) b_c^j(x, y)$$

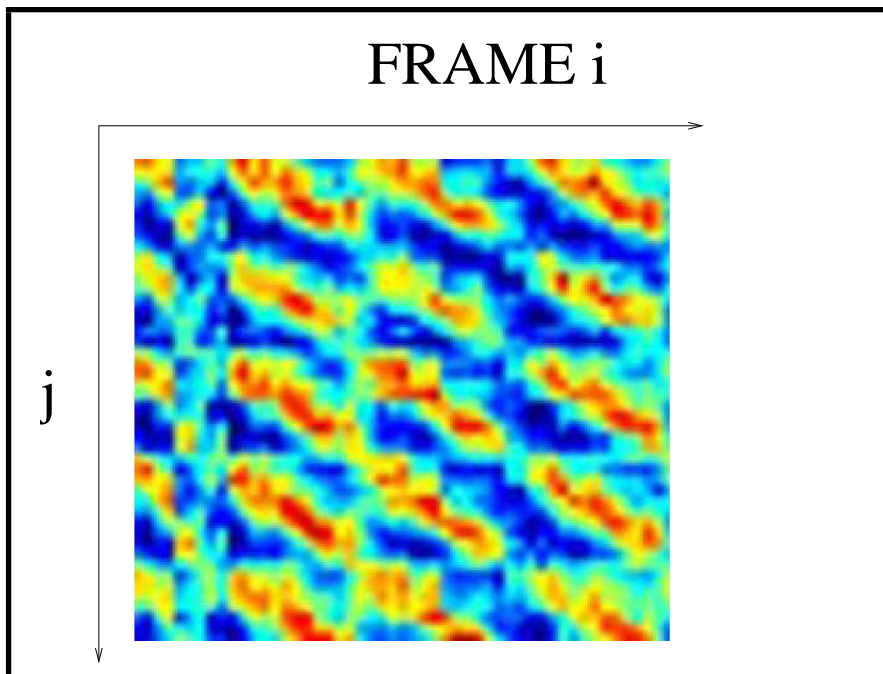
Where

Frame i of seq. a , frame j of seq. b

$c = 1, 2, 3, 4$ optical flow components

$(x, y) =$ pixel positions

FRAME i



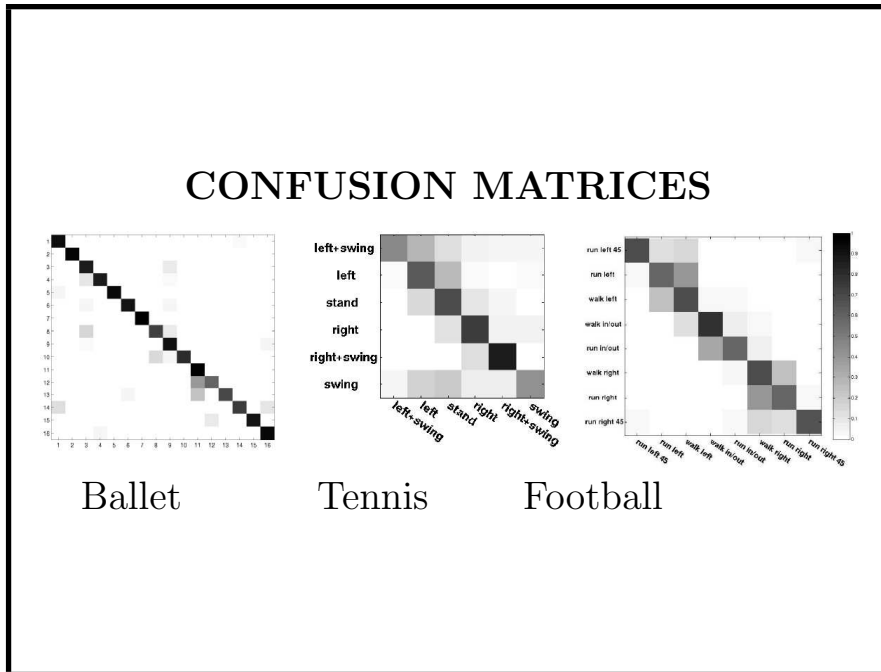
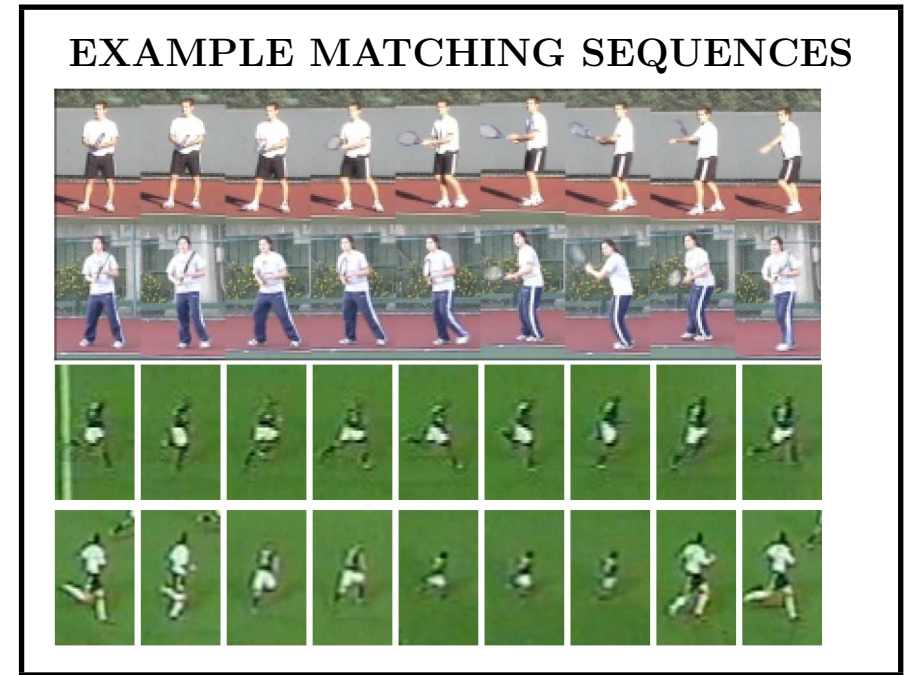
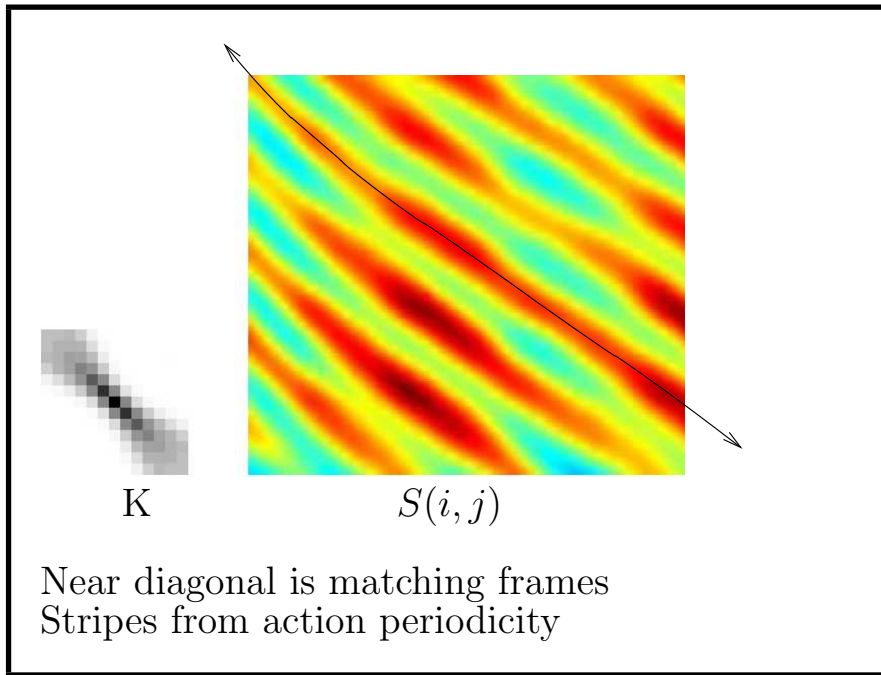
MATCHING DESCRIPTORS II

Problem: match score from a single frame a bit noisy

So use time window of $T = 50$ frames

$$S(i, j) = \sum_{r=-T/2}^{r=+T/2} \sum_{s=-T/2}^{s=+T/2} K(r, s) m(i+r, j+s)$$

Weighted sum of nearby in time frames
(convolution)



WHAT WE HAVE LEARNED

1. Short term action recognition technique
2. Based on stabilized optical flow of local medium sized windows
3. Encodes temporal structure better
4. But: still viewpoint and scale dependent