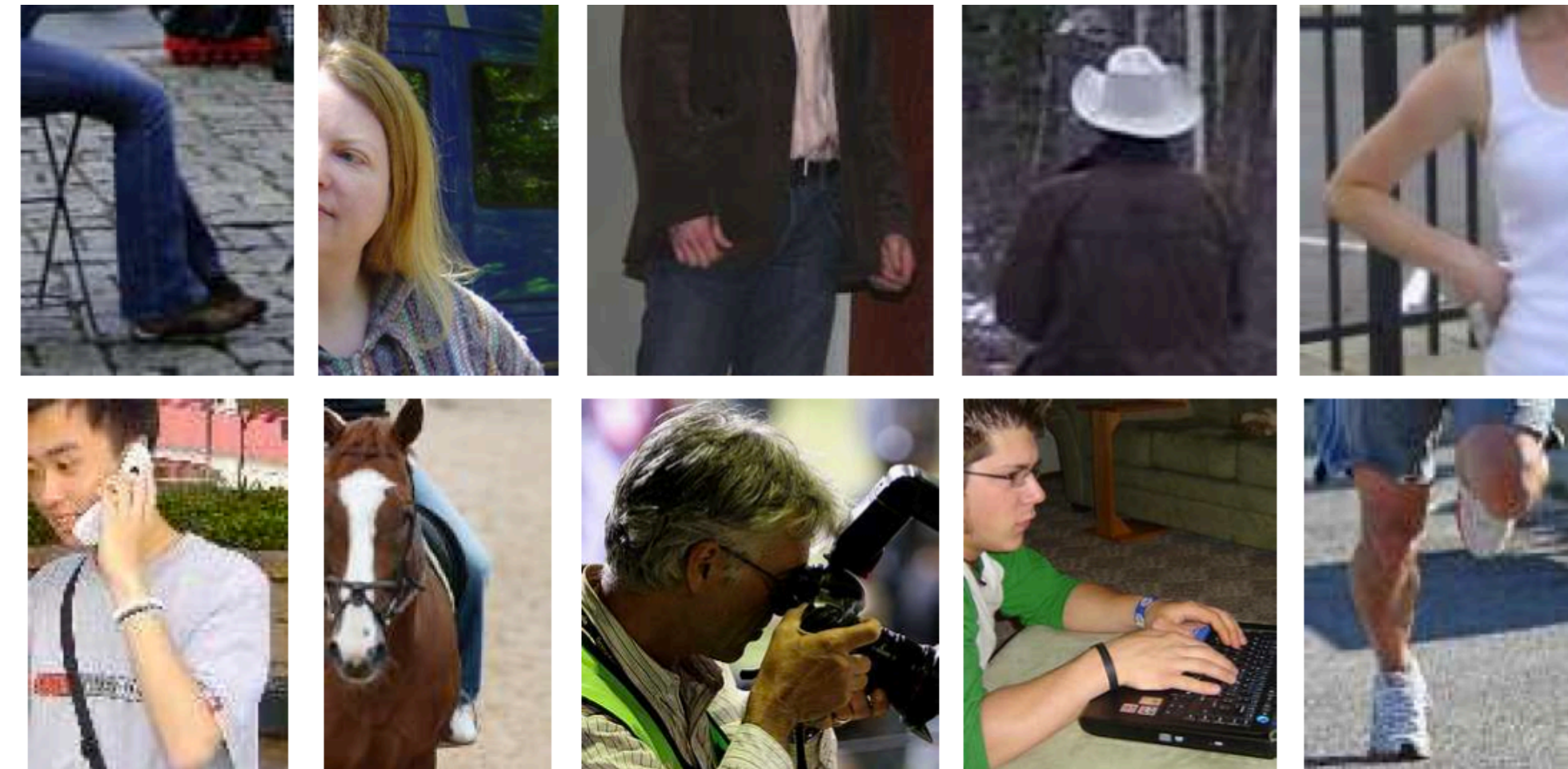


Static Image Action Recognition



Characteristic: *pose, appearance, objects, agents*

Motivation : Human Ability to Recognize the Pose and Action from Limited Views



Action and pose is revealed by body parts at various scales and locations

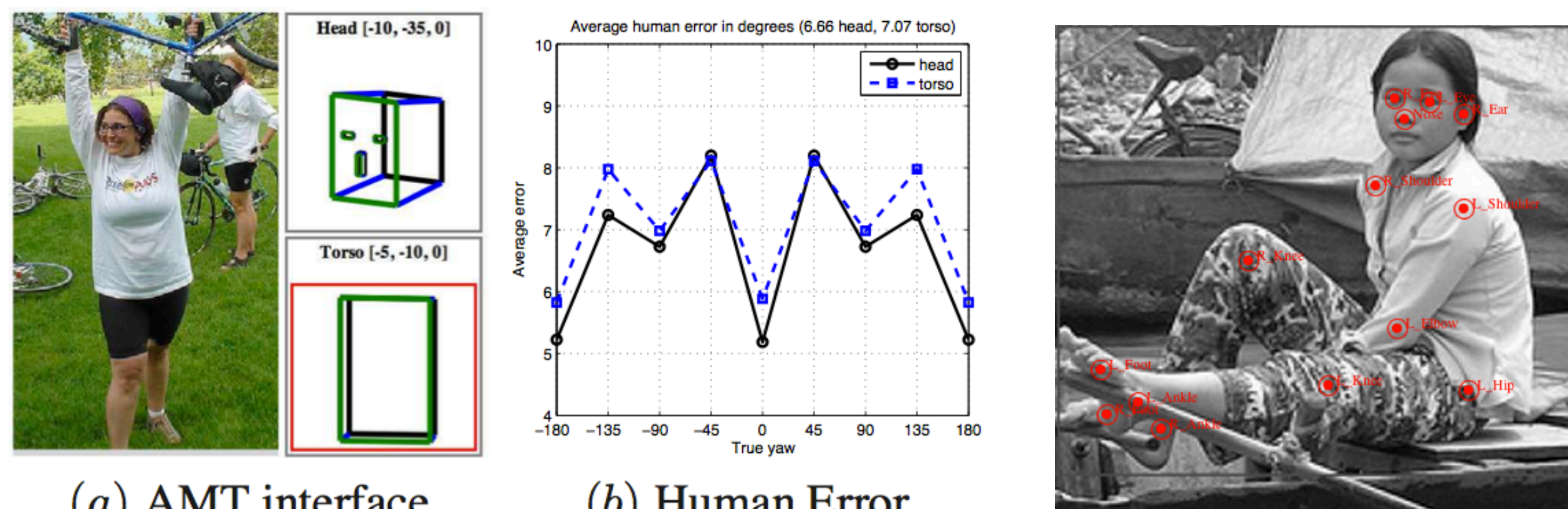
Robust Representation of Pose and Appearance

Poselet Activation Vector



Represent each example by the poselets that are active.
 Provides a distributed representation of pose and appearance

Collecting Annotations on AMT

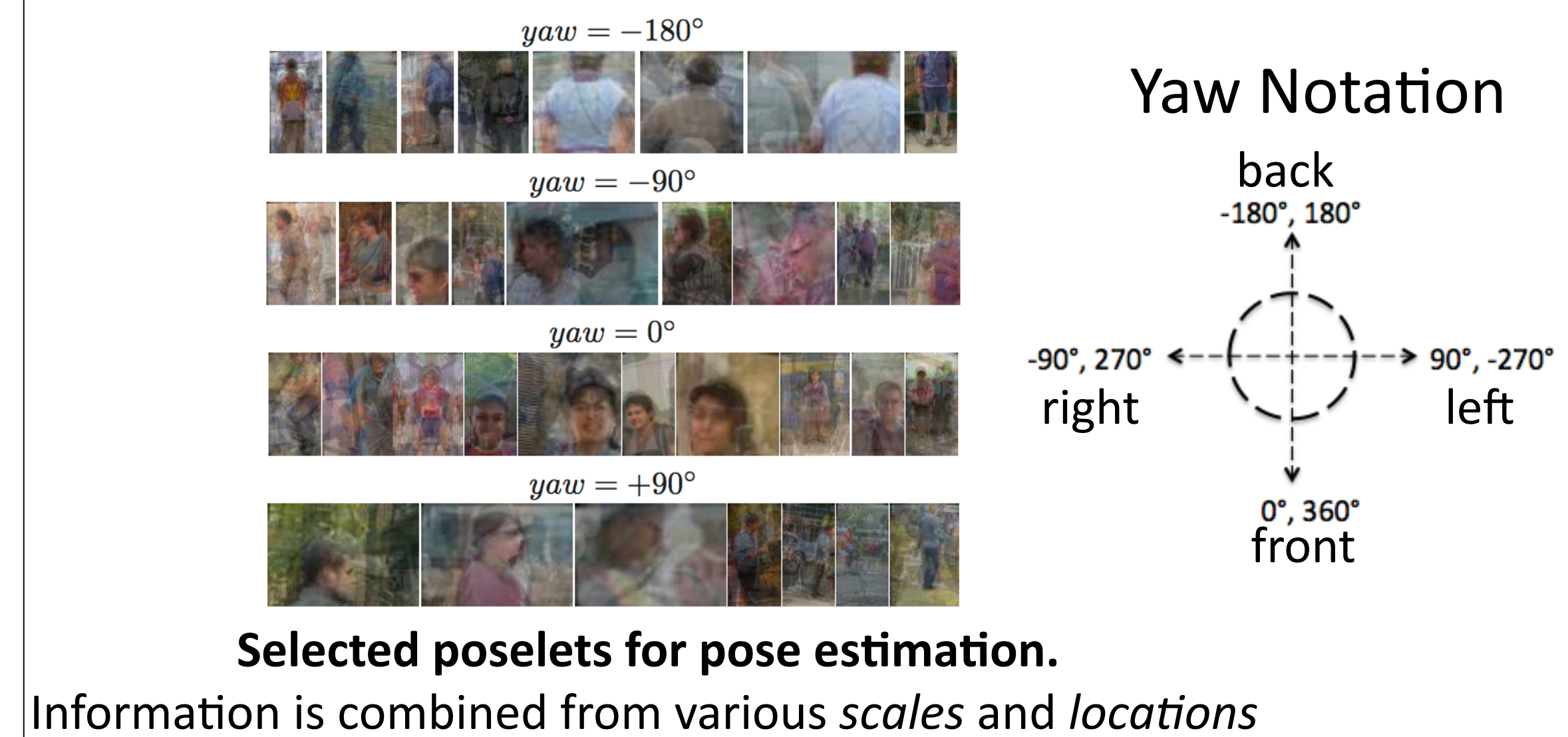


(a) AMT interface (b) Human Error
 3d pose of head and torso, joint locations on PASCAL VOC 10 images

Poselets of People^[1]



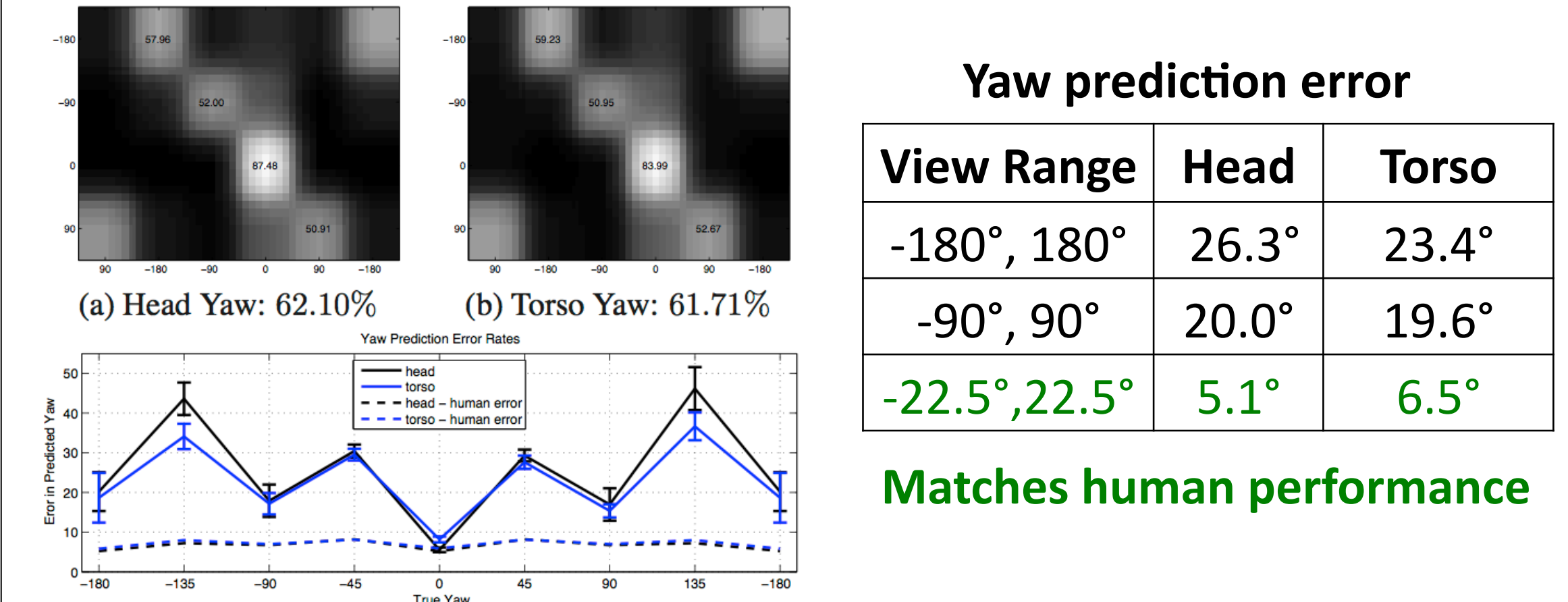
3D Pose Estimation of Head and Torso



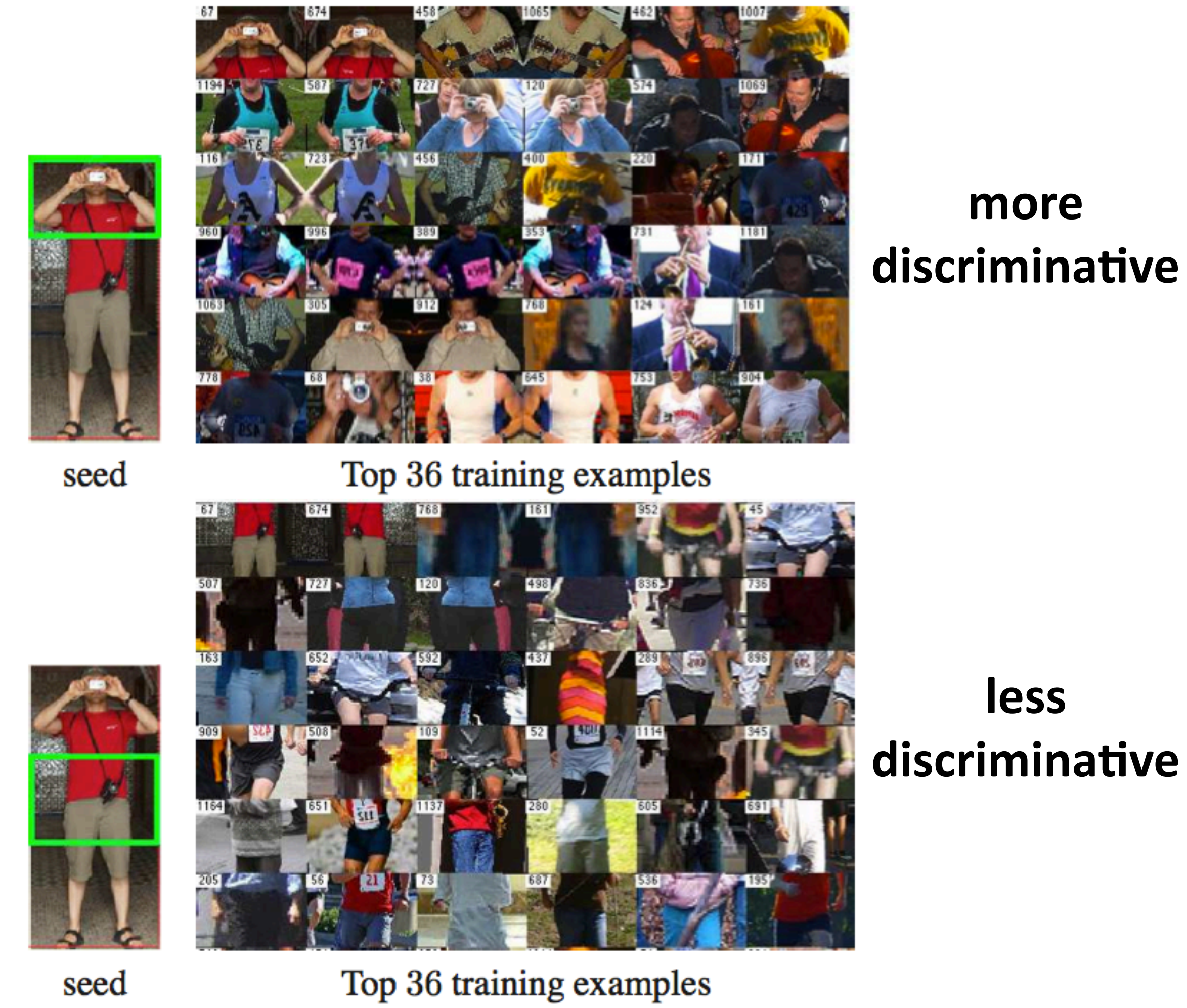
Example Predictions



Discrete pose prediction accuracy



Action Specific Pose and Appearance

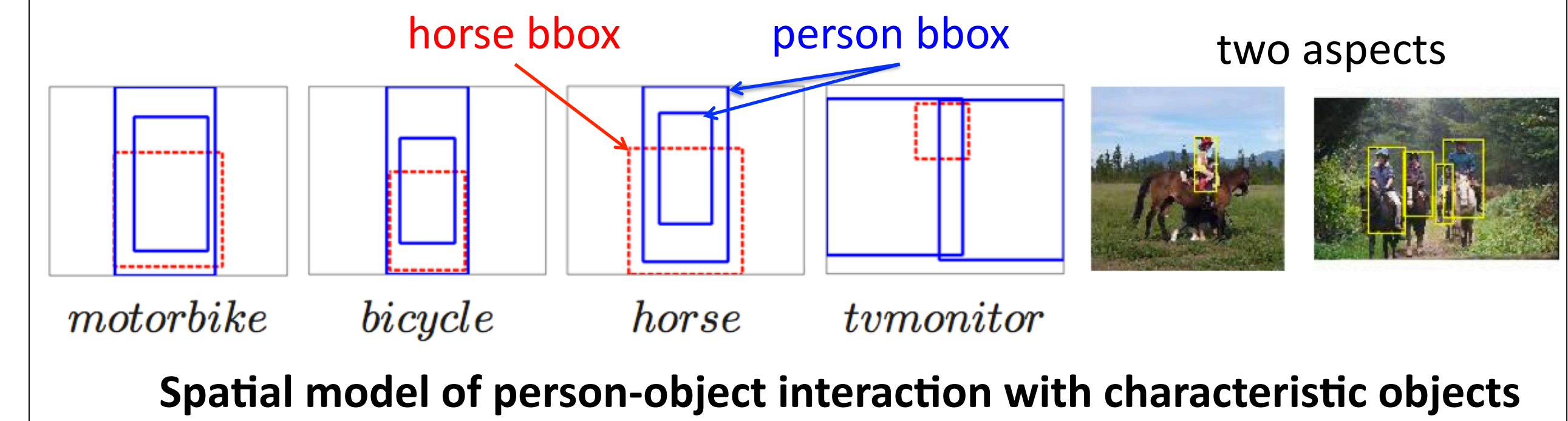


Pose. Select the poselets that capture salient pose. The top poselet is more discriminative as its similar examples contain more instances from within the same category.
Appearance. Restrict training examples from within the same category.

Selected Poselets for Action Classification



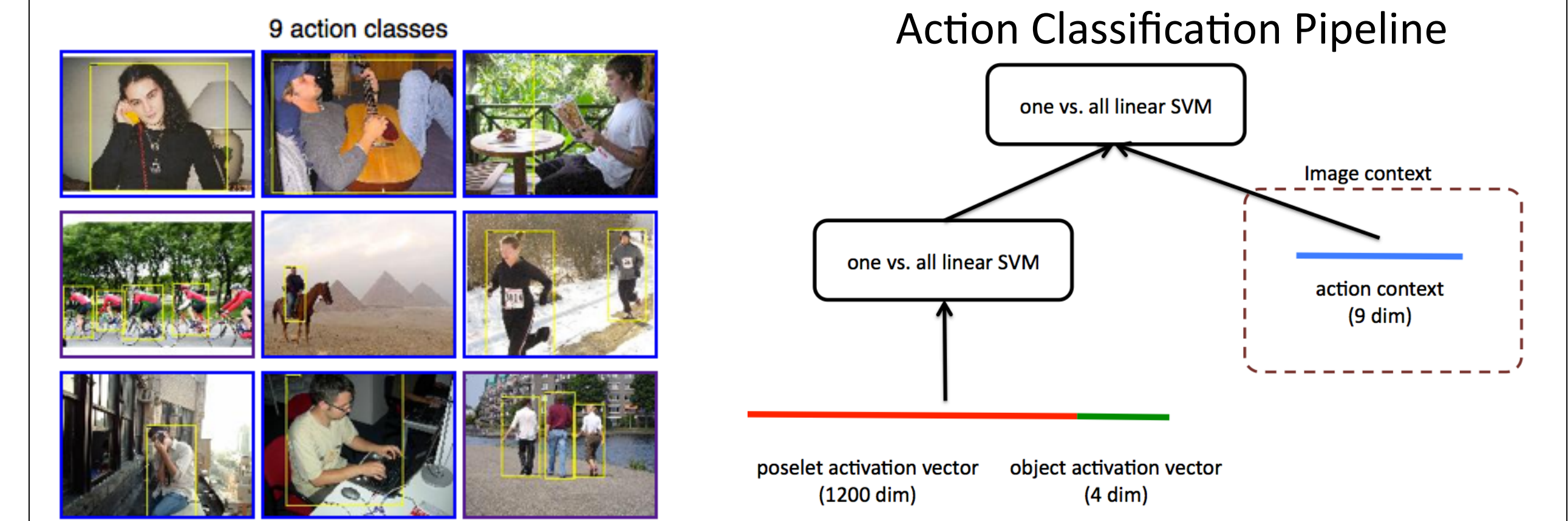
Information from Object Interaction



Information from Image Context



PASCAL VOC 2010 : Action Classification



Action Classification Results (MAP)

category	Validation			Test
	PAV	w/ OAV	w/ C	w/ C
phoning	63.3	62.0	62.0	49.6
playinginstrument	44.2	44.4	45.6	43.2
reading	37.4	44.4	44.3	27.7
ridingbike	62.0	84.7	85.5	83.7
ridinghorse	91.1	97.7	97.5	89.4
running	82.4	84.1	86.0	85.6
takingphoto	21.1	22.9	24.6	31.0
usingcomputer	54.2	64.9	64.3	59.1
walking	82.0	83.6	80.8	67.9
average	59.8	65.3	65.6	59.7

Overall MAP on the VOC 10 Test^[2]

Method	MAP
BONN_ACTION	54.4
CVC_BASE	60.8
INRIA_SPM_HT	60.1
NUDT_SVM_WHGO_SIFT_CENTRIST_LLM	56.6
SURREY_MK_KDA	62.2
UCLEAR_SVM_DOSP_MULTFEATS	61.1
UMCO_DHOG_KSVM	54.3
Our Method	59.7

References

- [1] L. Bourdev, S. Maji, T. Brox and J. Malik, *Detecting People using Mutually Consistent Poselet Activations*, ECCV 2010
- [2] <http://pascallin.ecs.soton.ac.uk/challenges/VOC/voc2010/results/index.html>