Human-in-the-loop Discriminative Patch Discovery:
New Algorithm

Input: Dataset \( D \) of image patches, set of negative images from the wild \( N^* \)
Output: Classifiers \( C \) for attributes \( A \)

1. \( A \leftarrow \) attributes
2. for \( A_j \in A \) do
3. \( S_{ij} \leftarrow \) seed exemplars of \( A_j \) in pose \( i \)
4. end
5. for \( S_{ij} \in S_i \) do
6. \( C_{ij} \leftarrow \text{svmTrain( } S_{ij}, N^* \) \( ) \)
7. \( N_{ij} \leftarrow \emptyset \)
8. \( V_i \leftarrow j \)
9. repeat
10. \( D \leftarrow \text{orderDetections( } C_{ij}, D - N_{ij} \) \( ) \)
11. \( N_{ij} \leftarrow N_{ij} \cup \text{hardNegatives( } D \) \( ) \)
12. \( C_{ij} \leftarrow \text{svmTrain( } S_{ij}, N_{ij} \cup N^* \) \( ) \)
13. until convergence()
14. end
15. return \( C, A \)

Mechanical Turk User Interface:

Click on all the image patches that contain: a blazer viewed from the front
Click submit when you are finished.
Drag or click images to select or deselect.

Example Positive Images

Candidate Images

Yes Images

Output: Final Set of Classifiers

Expert Review:
The initial experts can review detections for each attribute model, discarding models that are low-quality, e.g. low visual coherence, does not capture an aspect of the attribute.

Concept Drift:
When non-expert crowd members select hard negatives, sometimes the concept being learned can drift from the original exemplars. The example of ‘shorts’ to the right shows the classifier drifting to a more general ‘leg-exposing garment’ classifier. This problem does not occur if experts answer the active learning queries.