

# 16-720 Project Proposal: Tracking Human Motions

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## 1 Overview

We are interested in detecting and tracking humans in video clips. As beginning students in computer vision, we desire to gain exposure to the sort of techniques currently in use, to become familiar with some of the problems that are typically encountered in employing these techniques, and to investigate possible solutions and improvements. Human detection and tracking has many applications in surveillance and can be a very difficult problem depending on the environment of the images or video.

## 2 Methods and Datasets

In order to prepare us to track humans in video, we will begin with the simpler task of simply identifying humans in still photos. Once we have a working implementation for human detection, we will move on to tracking, though likely with many revisits to the detection problem as it proves necessary for tracking. Though our implementation language(s) are not yet fully fixed, we wish to use OpenCV in order to become acquainted with it.

In order to detect humans in still images, we intend to begin by using Histograms of Oriented Gradients [2]. In order to implement tracking, we will start out with the work of Andriluka, Roth, and Schiele [1], which has the added benefit of a published dataset we may use to evaluate our own work. Other possible datasets include the HumanEVA dataset [6].

## 3 Possible Extensions

After implementing a simple human tracking system, we will explore one of many possible extensions, time permitting. Possible extensions include extracting pose information in two or three dimensions [3], annotating different types of motion [4], or automatically personalizing the data used for matching [5]. It is also possible that we will opt for a different extension entirely, depending on the sorts of problems we encounter in our main implementation. All of these extensions may be regarded as "stretch goals", which we may or may not have time to reach.

## References

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- [3] D. M. Gavrila. The visual analysis of human movement: a survey. *Computer Vision and Image Understanding Vol. 73 No. 1, January*, pages 82-98, 1999.
- [4] D. Ramanan and D. A. Forsyth. Automatic annotation of everyday movements. *Proc. NIPS*, 2004.

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