Outline of Algorithm

1. Setup a streaming video capture from the pi camera
2. Start with Motion detection
   1. Grab a frame
   2. Convert to gray scale and blur
   3. Merge current frame into running average for background identification
   4. Calculate delta between current frame and background
   5. Threshold the delta to find changes
   6. Find countours in the thresholded image
      1. If the counter is bigger than a minimum size, mark it as movement of an object
      2. Find the rectangle that fits the countour
3. Once movement has been identified and the bounding rectable is known, run the pedestrian detection algorithm
   1. Uses an SVM detector trained with a using a pre-trained pedestrian detection HOG descriptor
   2. Pass the section of the image where motion was detected to the HOG descriptor
   3. The descriptor looks for people in multiple scales (can identify more than one person in the image section.
   4. Non maxima suppression used to filter out double positives
   5. If a person is detected in that motion frame, set a variable
4. Draw bounding boxes around areas of motion in the frame. Indicate which boxes have people in them and which do not.

Notes: To show the process we should grab a few intermediate images:

1. Thresholder motion detection image
2. Initial boxes found in the motion detected section of the image indicating what the algorithm thinks is a person