6.111 Project Abstract Proposal
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Sentry:Surveillance camera using image and audio processing for motion tracking and facial detection

We propose to develop a digital system capable of performing security functions – primarily surveillance. Many different situations require automated monitoring systems capable of not only tracking, but also capturing high quality surveillance data. Our system will use audio and visual information to detect the source of intrusion. The source is identified by either movement (visual tracking) or audio. A webcam and microphones will be installed for these purposes.

The system will also be able to zoom in on the source on an area it deems important. For example, if the source is identified as a human, the camera will zoom in on the face and take a snapshot. Furthermore, a projectile device can be mounted to fire at the source.

Bo will work on audio detection. Small amplitude noise is filtered out and three microphones placed on different sides of the camera will triangulate the source (if the source is behind the camera, then only audio information will help the camera locate the source).

Ray will work on motion detection and the motion algorithms associated with that process. Using interframe macroblock comparison and high frequency filtering, edges of moving objects can be detected. This information will be passed onto controlling camera motion and other outputs.

Bobby will work on using audio and visual data to center the camera onto the source in the M.I.A. (most important area) and control various outputs such as projectile firing and visual recording. Camera motion tracking information will be sent to a video display for testing and demonstration purpses.