

EE 368 Project Proposal

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Title:

Playground Babysitting System

Project description:

The goal of the project is to monitor the activity of children on the playground using one or more surveillance cameras. Children in the playground will be identified and tracked by software installed on a computer. Parents can watch their children on a computer screen or an android based smartphone. If the system loses view contact on the children, it will sound an alarm to the parents to draw their attention to the situation.

The development of the project can be divided into different phases.

Phase 1: The system is able to identify people present in the field of view (FOV) of the surveillance camera using histograms of oriented gradients (HOG) algorithm [1]. The user can select a particular people on the computer screen and the system will start tracking based on Kalman filter or particle filter [4]. If the tracked person goes out of FOV, system will sound an alarm on the monitor to notify the user about loss of view contact.

Phase 2: The system will be improved for more complicated situations. Two or more cameras will be involved in tracking process. Each camera will monitor a certain area that is not covered by the other cameras. A handover mechanism will be developed to suppress false alarm due to the loss of view contact in one camera view. The tracking system will be able to track the target even they turn around and move at a fast speed. The system may also allow temporary loss of view and cancel the alarm if the target returns into view.

Phase 3: Depending on the progress, interaction between the computer and an android phone could be implemented. Parents can watch their children on the playground on an android phone. They can also specify the tracking target and receive the alarm on the phone .

Whether use a DROID camera phone: YES!

Reference:

[1] Dalal, N. Histograms of oriented gradients for human detection. Computer Vision and Pattern Recognition, 2005. CVPR 2005, page 886 - 893 vol. 1

[2] Jianxin Wu, Real-time human detection using contour cues. Robotics and Automation (ICRA), 2011 IEEE International Conference on 9-13 May 2011. Page 860 - 867.

[3] Qiang Zhu; Mei-Chen Yeh ; Kwang-Ting Cheng ; Avidan, S. , Fast Human Detection Using a Cascade of Histograms of Oriented Gradients. Computer Vision and Pattern Recognition, 2006 IEEE Computer Society Conference on 2006. Volume: 2, On Page(s): 1491 - 1498.

[4] Shengluan Huang, Jingxin Hong .Moving object tracking system based on camshift and Kalman filter.Consumer Electronics, Communications and Networks (CECNet), 2011 International Conference on 16-18 April 2011. Page 1423 - 1426.