

Activity monitoring of people in buildings using distributed smart cameras

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Systems for monitoring the activity of people inside buildings (e.g., how many people are there, where are they, what are they doing, etc.) have numerous (potential) applications including domotics (control of lighting, heating, etc.), elderly-care (gathering statistics on the daily live) and video teleconferencing.

We will discuss the key challenges and present the preliminary results of our ongoing research on the use of distributed smart cameras for activity monitoring of people in buildings.

The emphasis of our research is on:

- the use of smart cameras (embedded devices): video is processed locally (distributed algorithms), and only meta-data is sent over the network (minimal data exchange)
- camera collaboration: cameras with overlapping views work together in a network in order to increase the overall system performance
- robustness: system should work in real conditions (e.g., robust to lighting changes)

Our research setup consists of cameras connected to PCs (to simulate smart cameras), each connected to one central PC. The system builds in real-time an occupancy map of a room (indicating the positions of the people in the room) by fusing the information from the different cameras in a Dempster-Shafer framework.