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### **Visual sensor networks and learning how people live.**

In recent years multi-camera based 2D-occupancy (positioning people on a 2D plan) is slowly reaching a state of maturity in the research labs. Here the cameras collaborate together on the vision task in recognising people and accurately put them into an occupancy map. Clear applications would be in surveillance applications, in smart buildings for HVAC and emergency control and last but not least in elderly care applications.

Something that is stopping a smooth transition into the commercial field is the relative cost of a camera-based solution versus the economical benefit it presents to the end-user. Although the cameras used are not expensive, still multiple applications have to be supported by the same installation in order to give installation and operation an economical benefit.

In this presentation we will present our work on reducing the cost of the system by transition from camera-networks to visual-sensor networks.

These completely embedded systems can perform similar 2D-occupancy tasks albeit not at the camera's accuracy, but at a similar level of usability for the overall application.

With the 2D-occupancy information generated by this visual sensor network, we have analysed the use of several office-buildings and a home. Based on the logged output of the system characteristics of the environment are discovered showing that the system is able to determine the specific use of a space based solely on observation and reasoning. This allows easy application and low-cost installation almost without user intervention.

After the self-calibration and environment discovery, the system gives insight in the use of a space and generates reports based on current and historical use, leading to discovering efficiency of use and anomalies. Some examples for building maintenance and elderly care are given.