Faculty of Electrical Engineering & Computer Science
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Separation of Subjects in High-Security Locks by using Capacitive Sensing.

ABSTRACT - Masterthesis

A reliable distinction between one and more than one person in the automated access control is of great importance. When access to high-security area e.g. bank or in border control, here personal interlock is used. These systems ensure without human influence, that only a single individual can pass through a particular transit area (Mantrap Portal). Existing technical approaches use thermal imaging (Body Heat), RGB-D Images, Camera image based and computer vision algorithm to verify if there are one or more persons in the transit area. Other known systems use weight or photo sensor based methods for verification.

In this Master's Thesis, we will investigate using capacitive sensors for this application. The most suitable capacitive sensing technique, as well as the number of sensors and their position, will be examined in this work. The performance of the developed system will be measured empirical testing and includes test scenarios in which an attacker tries to spoof the system. The system performance using capacitive sensors will be measured. Receiver operating characteristics (ROC) or Detection Error Tradeoff DET) curves will show how the developed system performs compared with other solution. The work will conclude with a feasibility analysis of the capacitive sensor technique in a possible practical usage.