

**ON THE DESIGN AND IMPLEMENTATION OF A
MULTI-CAMERA MULTI-PERSON HUMAN
TRACKING SYSTEM**

By

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ABSTRACT

Motion detection algorithms have come into more widespread use in recent years. All the while, tracking algorithms have grown more powerful, allowing for some advanced applications to be developed. This thesis describes the design and implementation of one such application, a multi-camera, multi-person tracking system based in Studio 2 of the Experimental Media and Performing Arts Center at Rensselaer Polytechnic Institute. The goal of this system is to make tracking information available in a space which is versatile, and commonly used, in order to explore potential applications thereof, particularly applications in science and art fields. This thesis details the complete process of designing and implementing a system of twelve overhead cameras pointed at the floor of the studio. The calibration of this system is described in detail, as well as automatic methods of motion detection and simple object tracking. The thesis concludes with a discussion of some special optimizations for multiple camera environments, as well as potential applications of the cameras and the underlying software.