

# Data Association and Occlusion Handling for Vision-Based People Tracking by Mobile Robots

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## Abstract

This paper presents an approach for tracking multiple persons on a mobile robot with a combination of colour and thermal vision sensors, using several new techniques. First, an adaptive colour model is incorporated into the measurement model of the tracker. Second, a new approach for detecting occlusions is introduced, using a machine learning classifier for pairwise comparison of persons (classifying which one is in front of the other). Third, explicit occlusion handling is incorporated into the tracker. The paper presents a comprehensive, quantitative evaluation of the whole system and its different components using several real world data sets.

*Key words:* AdaBoost, Occlusion Detection, Thermal Vision, Colour Vision, Bayesian estimation

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## 1. Introduction

This paper addresses the problem of people detection and tracking by mobile robots in indoor environments. A system that can detect and recognise people is an essential part of any mobile robot that is designed to operate in populated environments. Information about the presence and location of

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