



A LOW COST INDOOR POSITIONING SYSTEM USING COMPUTER VISION

**By
Youssef Nagui Elias Naggar**

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF SCIENCE

in

Aerospace Engineering

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Title of Thesis:

A LOW COST INDOOR POSITIONING SYSTEM USING COMPUTER VISION

Keywords:

Indoor positioning systems; Indoor navigation; Computer vision; Object tracking

Summary:

The research focuses on developing a low cost optical indoor positioning system solution where a static commercial camera is the only sensor used. The system is tested on tracking a group of robots characterized by simple colored markers. High accuracy in localization within the range of 1 cm is achieved. Detection, classification, and tracking techniques of an object are tested on mobile robots. The system is ideal for an indoor robotic warehouse environment application, where minimal infrastructure and cost parameters are required.

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