Tracking Construction Workers with Cameras

This research proposes a tracking scheme for tracking multiple workers on construction sites using video cameras. It discusses the possibility of and need for tracking workforce on construction jobsites using video cameras. An evaluation of algorithms and their associated results are presented.

The principal objective of this paper is to test and demonstrate the feasibility of tracking workers from statically placed and dynamically moving cameras. This paper also reviews existing techniques to monitor workforce and describes areas where this work might be useful in engineering applications.

The main difficulties associated with tracking on a construction site is the significant amount of visual clutter, the changing photometric visual content throughout the course of a day, and the presence of occluding and moving obstacles. Prior work has compared several contemporary tracking algorithms on construction sites and identified several difficulties, one of which included the existence of interacting workforce. In order to address the challenge of multiple workers within the camera’s field of view, this research has developed multiple tracking algorithms based upon machine learning methods.

Although the algorithms require several sample templates of the tracking target, they can learn quite quickly and create a general model that can be applied to other targets with similar geometry. A parameterized feature bank is proposed to handle the case of variable appearance content.

The tracking initialization has been discussed for different types of video cameras. A multiple tracking management module is applied to optimize the system.

The principal experimental objective of this research is to test and demonstrate the feasibility of tracking multiple workers from statically placed and dynamically moving cameras.

Typical construction site videos have been processed using the proposed algorithms and analyzed to determine the most appropriate tracking method for the video presented.

Major publications that are available to this topic to date are: