Tracking of multiple light-sources in a completely dark environment

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ABSTRACT

Economy has grown rapidly nowadays; therefore, protection of entrepreneurs and houses has been more and more essential. It makes perfect sense that a smart security monitoring system has become the focus of development and research in the field of information technology during the past few years. At present, most of the monitoring systems are handled by manpower, which is inefficient. It is highly likely that operators overlook some certain thing. As a result, it is highly needed to have an automatic video monitoring system. On the other hand, crime rate is far higher at nighttimes than daytimes. It is certainly a difficult but crucial to monitor at nights. In this study, inexpensive webcams are used as equipment of video capture. Also, they are utilized to detect and track mobile light sources the light source intruders bring in the dark. By doing so, we can estimate the track of the light source holder. In the process of tracking multiple light sources, this research takes many factors into account, including multiple-light interference, effect of reflection of background objects, holders or shades of furniture. However, it mainly focuses on tracking multiple-mobile lights in the dark and on estimation of the track of the holder. By harnessing 3225 images among 30 shots of all kinds of stimulations, we detect the location of light sources (the accurate rate is 94.36%) and judge the type of light source (the accurate rate is 93.39%), the distance and features of the light source the accurate rate 93.62%). The results and analysis of errors prove that methodology in this study works.

Keywords : intelligent video surveillance system, mobile light sources tracking, estimation of the track

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