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Video-based Mobile Mapping System Using Smartphones

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Abstract. The last two decades have witnessed a huge growth in the demand for geo-spatial data. This demand has encouraged researchers around the world to develop new algorithms and design new mapping systems in order to obtain reliable sources for geo-spatial data. Mobile Mapping Systems (MMS) are one of the main sources for mapping and Geographic Information Systems (GIS) data. MMS integrate various remote sensing sensors, such as cameras and LiDAR, along with navigation sensors to provide the 3D coordinates of points of interest from moving platform (e.g. cars, air planes, etc.). Although MMS can provide accurate mapping solution for different GIS applications, the cost of these systems is not affordable for many users and only large scale companies and institutions can benefit from MMS systems.

The main objective of this paper is to propose a new low cost MMS with reasonable accuracy using the available sensors in smartphones and its video camera. Using the smartphone video camera, instead of capturing individual images, makes the system easier to be used by non-professional users since the system will automatically extract the highly overlapping frames out of the video without the user intervention. Results of the proposed system are presented which demonstrate the effect of the number of the used images in mapping solution. In addition, the accuracy of the mapping results obtained from capturing a video is compared to the same results obtained from using separate captured images instead of video.

[Conference Paper](#) (PDF, 658 KB)

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