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## Motion Estimation on Homogenous Surface for Around View Monitoring System (Conference Paper)

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### Abstract

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Around View Monitoring (AVM) system uses multiple input cameras mounted on different positions of a vehicle to display 360° bird-eye-view around the vehicle that is not readily visible to the driver. The development of this system will contribute to the reduction of parking accidents by monitoring its surroundings, detecting lanes and identifying obstacles. With AVM, we can significantly decrease the number of minor accidents. AVM will not only be used for parking assistance but can also assist navigation in the narrow path area. Conventional AVM systems developed in the market using four or six cameras and requires an additional sensor for detection in order to minimise stitching error or to reduce the time to calibrate the output display image. The procedure is time-consuming and increases the cost of development. We propose to develop two ultra-wide-angle cameras located on the front and rear vehicle integrated with the motion estimation (ME) algorithm to produce a parking bird eye view and forward/backward trajectory lines. From our ablative analysis, optical flow is not suitable to be used for real-time ADAS systems as it fails at least 25.5% of the time. However, block matching algorithm based on normalized cross-correlation (CCORR NORMED) and normalised correlation coefficient (CCOEFF NORMED) were able to detect all templates correctly with 0% of false detection on our dataset. © 2019 IEEE.

### SciVal Topic Prominence ⓘ

Topic: Cameras | Distortion (waves) | Fisheye camera

Prominence percentile: 89.915 ⓘ

### Author keywords

ADAS Advance Driver Assistance System Around View Monitoring AVM Bird Eye View ME Motion Estimation Surround View

### Indexed keywords

Engineering controlled terms:

Accidents Automobile drivers Birds Cameras Monitoring Real time systems Vehicles

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Learning to map vehicles into bird's eye view

Palazzi, A. , Borghi, G. , Abati, D. (2017) *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*

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Hedi, A. , Lončarić, S. (2012) *IFAC Proceedings Volumes (IFAC-PapersOnline)*

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Engineering uncontrolled terms

ADAS

Block matching algorithms

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Engineering main heading:

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- 1 *Official Website of Malaysian Institute of Road Safety Research (MIROS)*. Cited 2 times. [Accessed: 25-Jan-2018] <https://www.miros.gov.my/1/page.php?id=17>
- 2 *What Are Car Surround View Cameras, and Why Are They Better Than They Need to Be?-ExtremeTech* [Accessed: 02-Dec-2018] <https://www.extremetech.com/extreme/186160-what-are-surroundview-cameras-and-why-are-they-better-than-they-need-to-be>