

Localization of Mobile Robots with Omnidirectional Cameras

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Abstract : Localization of mobile robots are important tasks for developing autonomous mobile robots. This paper proposes a method to estimate positions of a mobile robot using an omnidirectional camera on the robot. Landmarks for points of references are set up on a field where the robot works. The omnidirectional camera which can obtain 360 [deg] around images takes photographs of these landmarks. The positions of the robots are estimated from directions of these landmarks that are extracted from the images by image processing. This method can obtain the robot positions without accumulative position errors. Accuracy of the estimated robot positions by the proposed method are evaluated through some experiments. The results show that it can obtain the positions with small standard deviations. Therefore the method has possibilities of more accurate localization by tuning of appropriate offset parameters.

Keywords : mobile robots, localization, omnidirectional camera, estimating positions

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