

Application of Adaptive Particle Filter for Localizing a Mobile Robot Using 3D Camera Data

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Abstract : There are several methods to localize a mobile robot such as relative, absolute and probabilistic. In this paper, particle filter due to its simple implementation and the fact that it does not need to know to the starting position will be used. This method estimates the position of the mobile robot using a probabilistic distribution, relying on a known map of the environment instead of predicting it. Afterwards, it updates this estimation by reading input sensors and control commands. To receive information from the surrounding world, distance to obstacles, for example, a Kinect is used which is much cheaper than a laser range finder. Finally, after explaining the Adaptive Particle Filter method and its implementation in detail, we will compare this method with the dead reckoning method and show that this method is much more suitable for situations in which we have a map of the environment.

Keywords : particle filter, localization, methods, odometry, kinect

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