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Study on SLAM algorithm of mobile robot based on environment representation. (Chinese. English summary) [Zbl 07339406]  

Summary: This paper presents an algorithm for autonomous navigation, positioning and map generation in an unknown environment. The scenario considered in this article is a mobile robot using a distance scan provided by a 2D laser rangefinder to update the environment map, extracting the linear features of the parameters from the distance scan, and calculating the corresponding covariance matrix according to the statistical characteristics of the original data. By extending the Kalman filter, the robot pose and linear feature estimation are updated simultaneously, and the robot’s position and orientation on the map are estimated. The experimental results show that, in a real indoor environment, the SLAM technology proposed in this paper has high practicability.

MSC:
68T40 Artificial intelligence for robotics
93C85 Automated systems (robots, etc.) in control theory

Keywords:
environmental representation; motion control; mobile robot; tracking control