Accurate Positioning Method of Indoor Plastering Robot Based on Line Laser

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Abstract : There is a lot of repetitive work in the traditional construction industry. These repetitive tasks can significantly improve production efficiency by replacing manual tasks with robots. There- fore, robots appear more and more frequently in the construction industry. Navigation and positioning are very important tasks for construction robots, and the requirements for accuracy of positioning are very high. Traditional indoor robots mainly use radiofrequency or vision methods for positioning. Compared with ordinary robots, the indoor plastering robot needs to be positioned closer to the wall for wall plastering, so the requirements for construction positioning accuracy are higher, and the traditional navigation positioning method has a large error, which will cause the robot to move. Without the exact position, the wall cannot be plastered, or the error of plastering the wall is large. A new positioning method is proposed, which is assisted by line lasers and uses image processing-based positioning to perform more accurate positioning on the traditional positioning work. In actual work, filter, edge detection, Hough transform and other operations are performed on the images captured by the camera. Each time the position of the laser line is found, it is compared with the standard value, and the position of the robot is moved or rotated to complete the positioning work. The experimental results show that the actual positioning error is reduced to less than 0.5 mm by this accurate positioning method.
Keywords : indoor plastering robot, navigation, precise positioning, line laser, image processing
Conference Title : ICSLP 2022 : International Conference on Speech and Language Processing
Conference Location : Stockholm, Sweden
Conference Dates : July 12-13, 2022