 ISSN 2362-0412

Automated Cleaning Robot for a Domestic Environment

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In the modern world, most of the day to day tasks are replaced by robot applications. Floor cleaning is one of the significant functions which need much more time to fulfill correctly. This is an essential part of the household cleaning process, which requires a cleaner and tidy environment. A conventional floor cleaning method involves a broom to wipe out the dirt and waste clothes to wipe out the mud. Multifunctional robots capable of performing these two tasks are perfect solutions to this heavy time-consuming works. Mostly available autonomous solutions have several drawbacks when it comes to flawlessly executing these tasks. Identifying the mud and dirt correctly and performing the appropriate cleaning method to clean the dirt or mud surface is challenging for commercially available products. This study provides a solution to overcome those problems, and the proposed method can identify the mud and dirt correctly in the domestic environment. Also, selecting the cleaning method appropriate to clean the surface among sweeping and mopping is a product feature. A vision-based algorithm is used to separate mud and dirt elements on the surface. The product shows around a 70% success rate when identifying segments. A sensor-based embedded system is used to avoid obstacles, sharp edges, and stairs. Based on the findings, this product will save an average of more than two hours per week on a household chore.

Keywords: Cleaning robot, Dirt detection, Floor cleaning, Multi-functional cleaning, Mud identification