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Ashirwad: An extremely cost efficient Swabbing Robot

Rupinder Kaur
Bahra Faculty of Engineering and Technology
Bhedpura, Distt. Patiala, Punjab-147001
Email: errupinder23@gmail.com

Abstract : This swabbing robot is highly beneficial for cleaning purpose especially in homes, Offices, Industries where cleanliness is a major concern. Many research organizations are busy finding the best outcomes through the artificial intelligence. Of course, Artificial intelligence is a branch of technology that makes computers thinks like human brain. This device will sweep, and mop the floor area with brush and other wiping components; also it collects the dust and other small parts in it. Mapping is used to instruct the moment of this mini device. The device is too easy to use, very cost effective and cleans every corner of the area. Being autonomous, it would work in your absence.

Keywords: Swabbing robot, Artificial intelligence, autonomous.

I. INTRODUCTION

This Intelligent swabbing device is used to fully clean up the floor to a shine. Many machines are available in the market but some of them are too heavy, some are too costly, some are unable to reach the corners of the area and the most problematic the need human presence to work upon which is not possible always. Life is too busy and we are switching to automatic appliances. Almost all the automatics instruments are too costly that they cannot get fitted in the budget of the common people. Apart from cleaning it can trace the hidden objects where it is difficult to reach. It can work 24X7 to give you a polished surface. No need to look after it, it will simply do your entire floor clean up for you. Sensors provide you with much flexibility. No collision and 100 % work efficiency will please you with the results of the product. Its dust pan collects the dust

Harpreet Kaur (Asst. Professor & HOD),
Bahra Faculty of Engineering and Technology
Bhedpura, Distt. Patiala, Punjab-147001
Email: ruby009.kaur@gmail.com

and other small particles in it with the help of front brushes that dust in the inner container for better cleaning experience. The same base could also be used for future additions and some other devices of the kind.

II. LITERATURE REVIEW

A robotic cleaner is an autonomous electronic device that is intelligently programmed to clean a specific area through the use of hardware and software cleaning assembly. Some of the available products can brush around sharp edges and corners while others include a number of additional features such as wet mopping and UV sterilization rather than basic cleaning. Yasutomi et al.[i] (1988) proposed a algorithm which suited only to structured regions. Cao et al. [ii] (1988) used raster scanning technique in lawn mover. When a obstacle is detected it searches the boundry using omni-directional vision system, feedback the path planning for robot was done automatically by the system. Hofner et al.[iii] (1995) proposed a algorithm in which 2D map was used for path planning and it was updated according to the obstacles faced. Gonzalez and Suarez et al.[iv] in 1996 developed a similar algorithm for area filling. In this a topographical map was used for knowing the surround and the technique of searching was similar to Hofner. Chang et al. [v] (1993) used a technique of dividing area into sub-areas. More recently Ilari and Jane et al.[vi] used magnetic field based simultaneous localization and mapping. In this method a magnetic field sensor is used. There are certain distortions in indoor magnetic fields due to presence of certain objects. This technique makes use data given by the sensors for mapping. Maps generations are found to be accurate enough for guiding. Sherman et al. [vii] (1998) developed a logic for controlling behaviour of mobile robots for floor cleaning. It used fuzzy controllers for implementing behaviours, and state machine architecture for co-ordinating tasks like navigation, area filling and obstacle avoidance. Palacin et al.[viii] used ultrasonic sensors for map building. The motor was controlled using a PID controller and a microcontroller was used for controlling robot. Yunbo Hang et al.[ix] (2014) proposed a model for multifunction floor cleaning which included two different modules for cleaning and mopping. The technique of used water collection used is this design is the most effective and cheap one. Ynng-.loo Oh' and Yoshio Watanabe'[x] made a small cleaning robot which followed random paths. It had no provision for area filling. The currently available automatic floor mops in market make use of a vacuum pump to recollect the used water and then a cloth to absorb the

traces of water. This is a less effective technique as it sometimes leaves the marks of cleaning path followed. Also the area filling task is achieved using a indoor navigation system from north star, in which the robot receiver follows the signals from the transmitter and gets stuck sometimes in complicated environments.

II. DESIGN

It is designed in such a way that tedious output can be obtained. The following are the main components.

A. Brushing

Brushing mechanism consists of two rotating brush, cover, Gears and axles. Both rolling brushes mounted on beam with bearings gears. This mechanism is attached through several parts of the model base of robot. Brush is used to broom the dirt particles into the chamber for efficient floor cleaning.

B. Cleaning and Dirt Disposal

Cleaning and dirt disposal mechanism consists of motor, propeller, holders for fixing motor, Container mounted down the robot. Propeller directs the dust particles into the dust pan mounted downside the robot. Material Sheet has been molded in such a shape that it gave a shape of a robot. Size has been compacted so that it could clean the down some articles like sofas and tables.

III. ELECTRONIC CIRCUITRY

All circuits are first designed and simulated in Nxt brick using Mindstrom nxt software. There is a main circuits including one battery being used in this project and all these circuits are designed, analyzed and then implemented. Explanation of all these circuits is given below:

A. Motor block
B. Move block
C. Sensor blocks
D. Nxt Bricks
E. Cables
F. And other Miscellaneous components

D. Nxt Brick
E. Cables

IV. GRAPHICAL USER INTERFACE (GUI)

The main purpose of the GUI is to give all controls in the hand of user, so that he can use this product according to his needs. The software used for the programming of GUI of this device is Mindstrom NXT. As discussed, the robot can be used in manual mode as well as autonomous mode. Selection of the mode can also be done from this GUI. Mindstrom receives the data from I/O port and displays it on the GUI after decoding. However, the communication via Bluetooth is 2-way i.e. it sends some data as a delivery report. The terms, indicators and labels used in GUI for power controlling and management are employed.

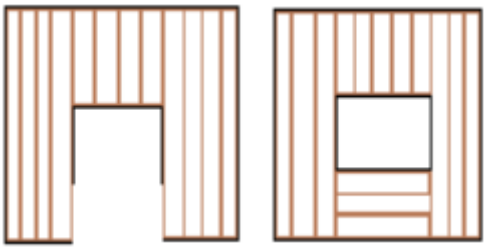

Fig. 1 Area filling algorithm

V. CONCLUSION

In this paper the design is modified and the development in work is done through Artificial intelligence. The issues with the early robots were the high cost and the size. Effectiveness in covering the area was an issue. Simple model is made to provide ease of use for end users. The Interface is user friendly and no special instructions are required for the better outcomes. Its cost makes it suitable for every user.

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REFERENCES

i. F. Yasutomi, D. Takaoka, M. Yamada, and K. Tsukamoto. Cleaning robot control. Proc. of IEEE Intemational Conference on Robotics and Automation, 3: 1839-1 84 1 , 1988.

ii. ii. Cao, Zuo Liang, Yuyu Huang and Ernest L. Hall. “Region Filling Operations with Random Obstacle Avoidance for Mobile Robots”, Journal of Robotic Systems, Vol. 5, No. 2, April 1988, p 87- 102.

iii. Hofher, Christian; Schmidt, Guenther “Path planning and guidance techniques for an autonomous mobile cleaning robot”, Robotics and Autonomous Systems v 14 n 2-3 May 1995. p 199-212.

iv. Gonzalez, E.; Suarez, A.; Moreno, C.; Artigue, F. “Complementary regions: a surface filling algorithm”,1996 13th IEEE Intemational Conference on Robotics and Automation. Part 1 (of 4), Minneapolis, MN, USA, 22-28, June 1996, p 909- 914.

v. Chang, C. L. and J. M. Shyu. A region-filling mobile robot. Proc. of International Conference on CAD/CAM, Robotics and Factories of the Future, pages 1128-11 41, 1993.

vi. Ilari Vallivaara, Janne Haverinen, Anssi Kemppainen, Juha R¨oning ."MagneticfieldbasedSLAMmethodforsolvingthelocalizationproblemin mobile robotfloor-cleaningtask", The 15th International Conference on Advanced Robotics Tallinn University of Technology Tallinn, Estonia, June 20-23, 2011.

vii. Sherman Y.T. Lang and Bing-Yung Chee. "Coordination of behaviours for Mobile Robot

Floor Cleaning",1998 IEEE/RSJ Intl.Conference on intelligent Robots and Systems Victoria, B.C., Canada, October 1998.

viii. J. Palacin, J.A. Salse, I. Valganon, X.Clua. "Building a Mobile Robot for a Floor-Cleaning Operation in Domestic Environments", IMTC 2003- Instrumentation and Measurement Technology Conference, Vail, CO, USA,20-22 May 2003.

ix. Yunbo Hong, Rongchuan Sun, Rui Lin, Shumei Yu, Lining Sun. "Mopping module design and experiments of a multifunction floor cleaning robot", proceeding of 11th World Congress on Intelligent Control and Automation Shenyang, China, June 29- July 4 2014.

x. Ynng-.loo Oh' and Yoshio Watanabe', "Development of Small Robot for Home Floor Cleaning", Proceedings of the 41st SICE Annual Conference

xi. IEEE Standard for User Interface Elements in Power Control of Electronic Devices employed in Office/Consumer Environments, IEEE Standard 1621,2004(R2009).

xii. Irobot.com, 'iRobot Corporation: We Are The Robot Company', 2015. [Online]. Available: http://www.irobot.com/.

xiii. Neato, 'Neato Robotics | Smartest, Most Powerful, Best Robot Vacuum', 2015. [Online]. Available: http://www.neatorobotics.com/.

xiv. Dyson.com, 'Latest Dyson Vacuum Cleaner Technology | Dyson.com', 2015. [Online]. Available: http://www.dyson.com/vacuum-cleaners.aspx.

xv. Dyson 360 Eyeâ„¢ robot, 'Dyson 360 Eyeâ„¢ robot', 2015. [Online]. Available: https://www.dyson360eye.com/.

xvi. Buck, 'The Best Robot Vacuums of 2015 | Top Ten Reviews', TopTenREVIEWS, 2014. [Online]. Available: http://robot-vacuum-review.toptenreviews.com/.

xvii. Harvey Koselka, Bret A. Wallach, David Gollaher,"Autonomous floor mopping apparatus," U.S. Patent 6741054 B2, May 25, 2004.

xviii. Joseph L. Jones, Newton E. Mack, David M. Nugent, Paul E. Sandin, "Autonomous floor-cleaning robot," U.S. Patent 6883201 B2, April 6, 2005.

xix. Andrew Ziegler, Duane Gilbert, Christopher John Morse, Scott Pratt, Paul Sandin, Nancy Dussault, Andrew Jones, "Autonomous surface cleaning robot for wet and dry cleaning," U.S. Patent 7389156 B2, June 17, 2008.