1. Design and Navigation Prospective for Wireless Power Transmission Robot

Summery : Mobile robots are becoming one of the most well-known applications of robotics. Land-based wheeled robots typically require the least investment while providing significant exposure to robotics. These robots are the most popular mobile robots among beginners due to their exposure to greater knowledge, cost factor, and simplicity. Qi wireless charger with USB charger as wireless power source. Product feature and technical specification of the wireless charger as follows. Charging time: 0.5 hours, Charging distance: 5~8mm,. Wireless efficiency: 70 max,. Ripple and Noise: 50mV, Products weight: 150g.Touch Sensor: Touch Sensor blocks are used to detect contact with an obstacle. Light Sensor: Light Sensor blocks measure brightness; Greater value means darker (or lower reflection). Sound Sensor: Sound Sensor blocks measured the sound pressure; Smaller value means louder sound. The Servo Motor Interface block is an interface block to the outside of a NXT controller model. Data from ultrasonic, touch, light and sound sensors are transmitted to the processor unit. The State Flow module handles state transitions of the robot. The Control unit includes a PID controller for navigation of two motors which are connected to wheel. Touch Sensor, Light Sensor, Sound Sensor and Servo Motor blocks are used to control a robot. In simulation,; however, they will be used to implement an appropriate device API in the generated code. The Touch Sensor consists of two blocks; the Light Sensor and Sound Sensor blocks are interface blocks for a controller model. The Servo Motor Interface block is an interface block to the outside of a NXT controller model. Data from ultrasonic, touch, light and sound sensors are transmitted to the processor unit. In this paper we can see their presented a robotic system which is used for the purpose of wireless charging between multiple users. In future we aim to further develop this robot with more functionality such as adaptive behaviour. We also plan to perform formal user studies to improve the design and behavior of the robot.

REFERENCES

[1]   Shidujaman, M.; Samani, H.; Arif, M., "Wireless power transmission trends," *Informatics, Electronics & Vision (ICIEV), 2014 International Conference on* , vol., no., pp.1,6, 23-24 May 2014

[2]   Arif, M.; Samani, H.; Chan-Yun Yang; Yung-Yuan Chen, "Adaptation of mobile robots to intelligent vehicles," *Software Engineering and Service Science (ICSESS), 2013 4th IEEE International Conference on* , vol., no., pp.550,553, 23-25 May 2013.

[3]   Gozalvez, J., "WiTricity-The Wireless Power Transfer [Mobile Radio]," *Vehicular Technology Magazine, IEEE* , vol.2, no.2, pp.38,44, June 2007.

[4]   Liguang Xie; Yi Shi; Hou, Y.T.; Lou, A., "Wireless power transfer and applications to sensor networks," *Wireless Communications, IEEE* , vol.20, no.4, pp.140,145, August 2013.

[5]   Waffenschmidt, E., "Wireless power for mobile devices," *Telecommunications Energy Conference (INTELEC), 2011 IEEE 33rd International* , vol., no., pp.1,9, 9-13 Oct. 2011.

[6]   Arif, M.; Samani, H., "AMBUBOT: Ambulance robot Automated External Defibrillator robotic ambulance," *Advanced Communication Technology (ICACT), 2014 16th International Conference on* , vol., no., pp.58,66, 16-19 Feb. 2014.

[7]   Kwon, J.-W., Chwa, D., "Hierarchical formation control based on a vector field method for wheeled mobile robots," *Robotics, IEEE Transaction on,* vol.28, no.6, pp.1335-1345, Dec. 2012.

[8]   Dadashzadeh, B., Mahjoob, M.J., "Fuzzy logic control vs. nonlinear P control of a three wheeled mobile robot (TWMR)," *Mechatronics and Automation, 2007.*

[9]   Amir Abdollahi, Hooman Aghaebrahimi Samani, "An efficacious method to assemble a modern multimodal robotic team: Dilemmas, challenges, possibilities and solutions," *Introduction to Modern* Robotics, pp.151-172, Dec. 2011.

[10]   Qi wireless power consortium www.wirelesspowerconsortium.com

[11]   Van Wageningen, D.; Staring, T., "The Qi wireless power standard," *Power Electronics and Motion Control Conference (EPE/PEMC), 2010 14th International*, vol., no., pp.S15-25,S15-32, 68 Sept. 2010.

[12]   Hui, S.Y., "Planar Wireless Charging Technology for Portable Electronic Products and Qi," *Proceedings of the IEEE* , vol.101, no.6, pp.1290,1301, June 2013.