

Voice Controlled Wheelchair

Aditya Dixit, Rohit Jadhav, Omkar Bade

Students, Department of Mechanical Engineering
Jayawantrao Sawant College of Engineering, Pune, India

Abstract: *This project is designed to control a robotic wheelchair by voice commands for remote operation. An ARM series microcontroller is used together with an Android Application for the desired operation. The Android Application is connected to the Bluetooth module (HC-05) present on the Robot via Bluetooth. The commands are sent to the robot using push buttons or voice commands present on the android application. At the receiving end two dc servo motors are interfaced to the microcontroller where they are used for the movement of the wheelchair. The RF transmitter of the Bluetooth can take either switch press or voice commands which are converted to encoded digital data for the advantage of adequate range (up to 100 meters) from the robot. The receiver decodes the data before feeding it to another microcontroller to drive DC motors via motor driver IC for necessary work. This technology has an advantage over long communication range as compared to RF technology. Further the project can be developed using IoT technology where a user can control the robot from any corner of the world.*

Keywords: Assistive technology, Voice-controlled wheelchair, Speech recognition, Mobility, Independence, User testing

REFERENCES

- [1] A.N Khan, K. Priya, S. Kumar-“Implementation of Voice Controlled Robotic Vehicle with Automatic Braking and Obstacle Avoidance”. In INROADS Vol. 7 (Special Issue), 2018
- [2] Prof. B. Jolad, M. Arora, R. Ganu, C. Bhatia -“Voice Controlled Robotic Vehicle”. In IRJET Volume: 04 Issue: 06, June-2017
- [3] Dr. M. Narayana, A. Alishety, H. Chapala -“Voice Controlled Robot using Android Application”. In International Journal of Engineering Innovation and Research Volume: 04 Issue: 02
- [4] P. Norek, M. Ahmed, et al, “Livelihood Challenges for Extremely Poor Disabled People in the Southwest Coastal Region of Bangladesh”, Shiree working paper 12, January 2013.
- [5] T. Röfer, & A. Lankenau, “Ensuring Safe Obstacle Avoidance in a Shared-Control System”, Proceedings of the IEEE/RSJ/GI International Conference on Emerging Technologies and Factory Automation 1999, Vol. 2, 1405-1414, October 1999
- [6] E. Prassler, J. Scholz, M. Strobel, & P. Fiorini, “An Intelligent (Semi-) Autonomous Passenger Transportation System”, Proceedings of the IEEE/IEEJ/JSAI International Conference on Intelligent Transportation Systems Proceedings 1999, 374-379, October 1999.
- [7] D. Miller, & M. Slack, “Increasing Access with a low-cost Robotic Wheelchair”, Proceedings of the IEEE/RSJ/GI International Conference on Intelligent Robots and Systems '94, Vol. 3, 1663-1667, September 1994.
- [8] M. Lawn, & T. Takeda, “Design of a robotic-hybrid wheelchair for operation in barrier present environments”, Proceedings of the 20th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Vol. 20, No 5,
- [9] J. Hockenberry, (cited 20-May-2001) “A revolutionary new wheelchair”, NBC <http://www.msnbc.com/news/285231.asp>, June 2000.
- [10] S. Fioretti, T. Leo, & S. Longhi, “A Navigation System for Increasing the Autonomy and the Security of Powered Wheelchairs”, IEEE Transactions on Rehabilitation Engineering, Vol. 8, No. 4, 490-498, Dec 2000.
- [11] P. Trahanias, M. Lourakis, S. Argyros, & S. Orphanoudakis, “Navigational support for robotic wheelchair platforms: an approach that combines vision and range sensors”, International Conference on Robotics and Automation 1997, Vol. 2, 1265-1270, April 1997.

- [12] G. Pires, R. Araujo, U. Nunes, & A. Almeida, "RobChair-a powered wheelchair using a behaviour-based navigation", International Workshop on Advanced Motion Control 1998, 536-541, June 1998.
- [13] N. Katevas, N. Sgouros, S. Tzafestas, G. Papakonstantinou, P. Beattie, J. Bishop, P. Tsanakas, & D.Koutsouris, "The Autonomous Mobile Robot SENARIO: A Sensor-Aided Intelligent Navigation System for Powered Wheelchairs", IEEE Robotics & Automation Magazine, Vol. 4, Issue 4, 60-70, December-1997.