

The smart wheelchair

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A wheelchair controller that automatically avoids obstacles and knows when the user is tired or stressed is being developed by researchers in India. Details are described in the *International Journal of Human Factors Modelling and Simulation*.

Naveen Kumar Malik of the Department of Electronics and Communication at Maharishi Dayanand University, in Haryana and V.R. Singh of the National Physical Laboratory in New Delhi, India, explain how they are developing a wheelchair navigation system that incorporates enhanced safety features and warning systems to assist users more effectively than any conventional powered wheelchair. The microcontroller is programmed with an algorithm that has six levels of testing surroundings and the user's voice to make the wheelchair "smart", creating what the team describes as a cognitive wheelchair navigation system.

The system circumvents several of the problems facing users and carers where conventional unpowered or powered wheelchairs are being used, especially by weaker users or users with cognitive impairment. The new microcontroller system endows the smart wheelchair with a collision avoidance and warning system, a system to discern emotional distress or drowsiness in the user and provide a warning of possible problems that might arise in such situations to the user or carer. The smart wheelchair could also monitor user's heart rate, temperature or other vital signs for diagnostic purposes.

The team has now built and demonstrated a prototype of their smart

wheelchair controller and hopes to commercialize the system. "The commercial version of the prototyped autonomous wheelchair would reduce the burden on care-giving staff in healthcare industry and improve the quality of life for disabled persons," they conclude.

More information: Naveen Kumar Malik et al, A human inspired cognitive wheelchair navigation system, *International Journal of Human Factors Modelling and Simulation* (2016). [DOI: 10.1504/IJHFMS.2016.10000483](https://doi.org/10.1504/IJHFMS.2016.10000483)

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