Smart Wheelchair For Physically Challenged individuals

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Motivation

Individuals with quadriplegia cannot use joystick controlled power wheelchairs due to lack of force or psychomotor problems in the superior members [1]. This project aims to provide a comfortable alternative control method with a smart obstacle detection feature

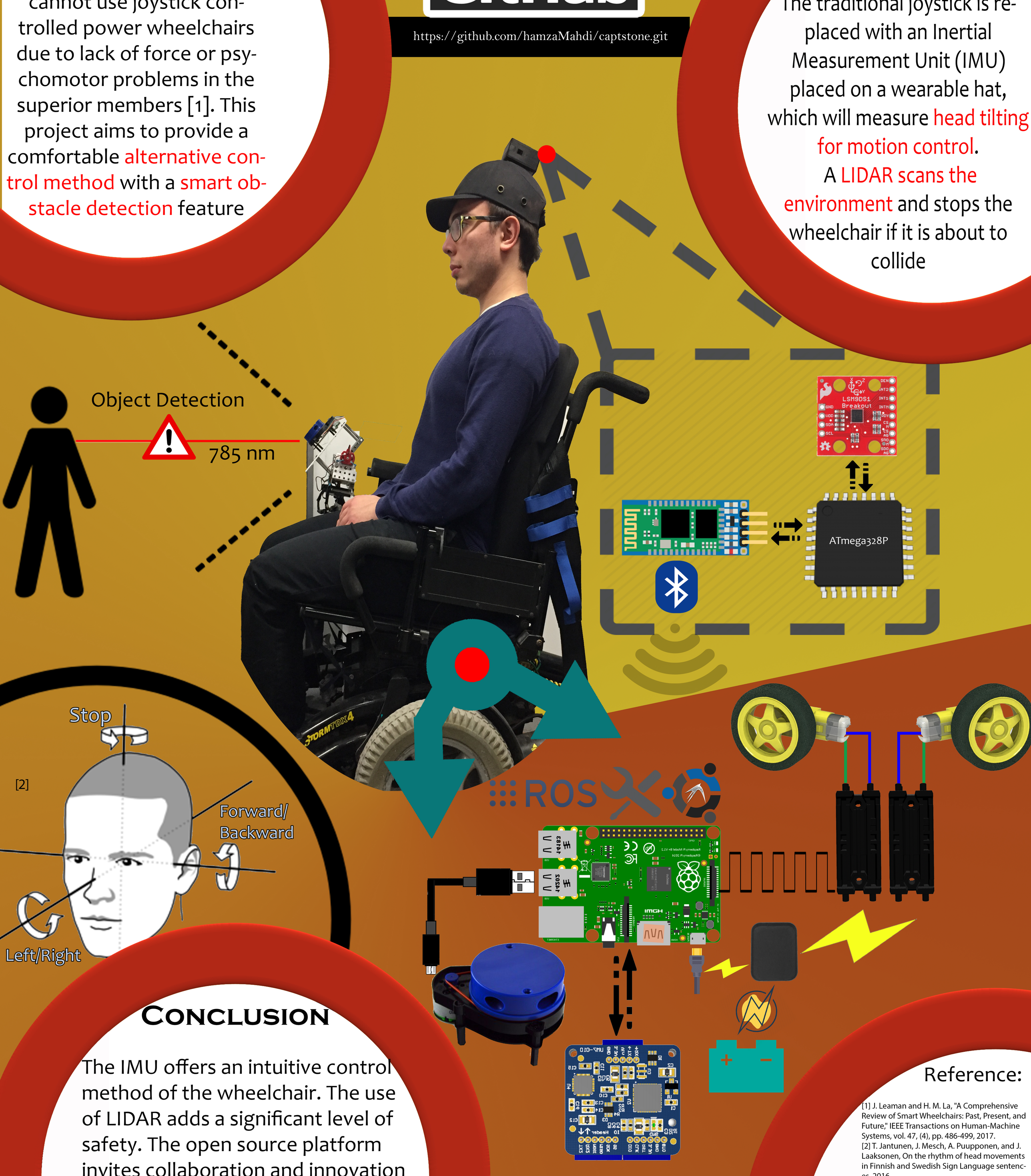
Fork me on GitHub

https://github.com/hamzaMahdi/captstone.git

Approach

The traditional joystick is replaced with an Inertial Measurement Unit (IMU) placed on a wearable hat, which will measure head tilting for motion control.

A LIDAR scans the environment and stops the wheelchair if it is about to collide



Conclusion

The IMU offers an intuitive control method of the wheelchair. The use of LIDAR adds a significant level of safety. The open source platform invites collaboration and innovation

Reference:

[1] J. Leaman and H. M. La, "A Comprehensive Review of Smart Wheelchairs: Past, Present, and Future," IEEE Transactions on Human-Machine Systems, vol. 47, (4), pp. 486-499, 2017.

[2] T. Jantunen, J. Mesch, A. Puupponen, and J. Laaksonen, On the rhythm of head movements in Finnish and Swedish Sign Language sentences. 2016.