EENX15-18-01; Motion control of an electrified wheelchair

Bakgrund
Modern embedded devices and open source real-time operating systems allows an endless variety of opportunities to provide systems used in our every-day life with advanced functionalities at relatively low costs. Plenty of homemade surveillance and home automation projects can be found on the web, based on low cost hardware and computer components.

Problembeskrivning
The objective of this project is to design and implement a low level motion control system for an electrified wheelchair. The system should be able to command the electric motors of an electrified wheelchair in order to deliver speed and acceleration commands generated by an upper level control application (which is not part of this thesis project).

The motion control algorithms have to be designed with model based techniques, in order to satisfy requirements like, e.g., stability, response time, bounded overshoot, bounded accelerations and jerks, prescribed tracking offset etc. The implementation of more advanced functionalities, like detection of closed-distance objects and soft barrier might be implemented, as time permits.

The developed motion control algorithms should be deployed on low-cost hardware like, e.g., Arduino. The final report, written in English, should document, thorough plots of measured data, the fulfillment of the design requirements.

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