Supervisor Control of 4WD vehicles

PED8 project proposal, spring 2011

Background

The future predicts the exhaust of fossil fuels, and to counteract this problem there is a growing need for alternative drive systems for vehicle fleet. Electric cars is the only feasible alternative at the moment. Not only are they the only feasible solution, but there are several advantages, such as the removal of mechanical drive system consisting of shafts, gears and a clutch. But the functionality of the mechanical drive system needs to be implemented in the electrical drive system. The most pressing problem, which needs to be solved, is that of the differential. This proposal is based on a supervisor control which both solves the lack of a differential and anti spin.

Objective

With focus on the control part of the project, the objective is to analyse, design, implement, and test a control system consisting of a supervisor and four speed controllers.

Contents

The project may include some of the following topics:

- Modelling of vehicle dynamics and motor characteristics.
- Measurement of parameters / characteristics.
- Motor control design.
- Individual reference strategies during normal environment situations-
- Anti-spin strategies.
- Supervisor control.
- Laboratory implementation using a DSP or FPGA.
- Experimental tests and evaluation of results.

A RC car with 4 DC motors and a control unit is provided for the project.

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