Intelligent controller design for electric vehicle

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Abstract:
In some electric vehicle the power supplied by the battery is DC in nature and is inappropriate to operate a variable speed DC motor. The battery power is converted to the required regulated supply for the motor by using an electronic power converter. The exact nature and timing of the current and voltage waveforms that are fed to the motor are determined by the controller system .The motor converts the electric power into mechanical energy at the shaft, which then drives the wheels through an appropriate transmission/speed reducer system. The torque and power requirements for an electric vehicle are quite unique among variable speed drive applications. The desirable torque/power vs. speed characteristics is very important for the drive to be capable of maintaining high efficiency over broad ranges of torque and speed. It is required that motors are related to operate at certain voltage and are sensitive to fluctuations in this voltage. In an electric vehicle the voltage is dependent upon the battery's state of charge and the load current. Both these factors can alter the voltage as much as 20% and hence the motor should be capable of handling these fluctuations in supply voltage. The two methods of scaling a drive are namely the torque scaling and speed scaling required for transmission speed reduction. Speed scaling would require a transmission/speed reducer because of the change in reduction ratio. This paper is primarily aimed at developing a fault tolerant fuzzy logic controller .The fuzzy logic controller (FLC) is modeled to be capable of increasing the initial torque required for the electric vehicle drive with variable speed characteristics and high efficiency. An efficient gear-changing algorithm is given with simplified block diagram.

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