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An automotive cruise control using fuzzy control optimized via unscented Kalman filter

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In this paper, the objective is to generate and optimize the fuzzy membership functions for an automotive cruise control in order to obtain a better and faster response facing with the changes in the driving conditions. The regular method for optimization is gradient descent, but in this paper, we use the Unscented Kalman filter (UKF) in a special manner to optimize the membership functions and also modify the membership function. We will show that the UKF is a powerful method for increasing the performance of a fuzzy system.

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Traction control and fly wheel regenerative energy system

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Presently the AC Motor technologies for motive power in heavy vehicle applications are fledgling to replace DC and Permanent Magnet (PM) motors. With High efficiencies, maintenance free technologies such as like Induction AC motors as well as availability of power electronics upgrade switching making inroads into better traction applications. In this paper, efficient, high speed traction control systems and the adaptation of Fly wheel based regenerative energy system is considered. It also focuses on the design concepts of Kinetic Energy Recovery Systems and regenerative braking. The technology development effort shall be to standardize the adaptation techniques of all these equipment under one umbrella, thereby end user gains the advantage of cross implementation cost effectively without compromising on the final performance. Hence the project is constrained to standardize the application engineering of above referred patented systems with flexibility brought in through Design, Engineer and develop additional components like adapters/ fixtures/control algorithms to adapt to varying conditions existing in various parts of the world. The details of the design concept, systems architecture includes analysis of requirements and development of the functional design specification is reported and the established concept via the use of simulation modeling and subsystem bench tests has been validated. Efficient motor, Traction controller technology and systems integration of Regenerative Fly wheel Energy Storage system are the main technical challenges in this project .

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