
Departmental Seminar

Seminar Title	: Fuzzy-PI based Energy Management System for a Fuel Cell-Battery operated DC motor drive
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Venue	: UG Seminar Room
Date and Time	: 28 Mar 2025 (5:15 PM)
Abstract	: The primary aim of this study is to design and analyze an Energy Management System (EMS) for a DC motor drive. The system under consideration features a primary energy source, a Fuel Cell (FC) supplemented by a battery storage system. Battery supplements power requirements during starting and energy recovery through regenerative braking. The system has two DC-DC converters: one unidirectional boost converter connected to FC and another bidirectional converter connected to the battery for both charging and discharging, with the motor being connected to the common DC bus. The control technique is implemented by a cascaded fuzzy and PI control which when implemented in this study effectively stabilizes voltage, improves power distribution and enhances adaptability of this EMS. The hTLBO-PS algorithm helps in optimizing the coefficients of the PI controller. This work is a step towards a broader call for enhancing the performance of Hybrid Electric Vehicles (HEVs) by implementing advanced EMS techniques and addressing key global energy challenges.