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Lipsa Ray; Pampa Sinha; Chitralekha Jena; Kaushik Paul

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A Hybrid APF Approach for Obstacle Avoidance in a 3D Environment 

Amrita Saini; Bhaskar Jyoti Talukdar; Rudra Narayan Dash; D Chandrasekhar Rao; Bikramaditya Das

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Paramjeet Singh; Bhaskar Jyoti Talukdar; Rudra Narayan Dash; Bikramaditya Das

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Enhancing Power Quality in Solar-Integrated Smart Grids for EV Systems Through Smart Controller 

V Raveendra Reddy; Kasa Sudheer; Venkata Anjani Kumar; S K Masthan; Vikram Kulkarni; Thummala Ravikumar

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Harmonic Fingerprinting for Power Quality Source Identification Using Non-Subsampled Contourlet Transform 

Partha Chakraborty; Pampa Sinha; Subhra Debdas;



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Soubhagya Ranjan Prusty; Sudhakar Sahu; Sarita Nanda; Satyaranjan Jena; Chitrlekha Jena; Pradeep Kumar Sahu

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Enhancing Measurement Precision in FBG Sensors Through Robust Temperature Compensation Mechanisms 

Satyapriya Satapathy; Ambarish G. Mohapatra; Jaideep Talukdar; Narayan Nayak; Dipak Ranjan Nayak; Ashish Khanna

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Design Algorithms for Lifelong Learning That Maintain Performance on Old Tasks While Learning New Ones 

Madhav Sharma; Hukum Chand Saini; Pushpendra kumar Sikarwal; Akash Saxena; Samiksha Agarwal

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A Compact Dual Band Circularly Polarized Planar Antenna 

Manoj Kumar Das; Sudhakar Sahu; Jyoti Ranjan Panda

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Performance Analysis of the Battery Management System in an Electric Vehicle

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[Snehashis Ghoshal](#) ; [Sunil Kumar Choudhary](#) ; [Arindam Mondal](#) ; [M. Prakash](#) All Authors

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Abstract:

Electric Vehicles (EVs) play a pivotal role in addressing the challenges of present-day needs related to the reduction of greenhouse gas emissions and reliance on fossil fuels. EVs contribute to clean air quality, mitigate climate change, and promote sustainability through the integration of renewable technologies. Besides, it has become economical due to its lower operating costs. Hence, EVs foster a shift towards a robust, resilient, and eco-friendly transport sector and create scopes for innovation in green technologies. The role of a Battery Management System (BMS) becomes impertinent in the case of EVs as it is the main factor for the proper operation of EVs. There is a remarkable scope for enhanced battery performance in EVs for more reliability and endurance. Hence, research and development in BMS as well as its temperature regulation are therefore major fields of concern. In the present study, a BMS was designed and simulated for efficient charging and discharging addressing different battery faults by maintaining its temperature to reasonable limits. Results showed enhanced performance of the BMS with reasonable SoC, steady voltage, and current profile. Improved battery performance leads to a more efficient driving experience as well as fast charging capability thereby reducing the cost involved and enhancing the sustainability of the system.

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I. Introduction

Electric Vehicles play a significant role in present days due to the acute need to solve energy and environment-related issues. Road transport is responsible for over 70% of greenhouse gas emissions and over 25% of world energy consumption, making the transportation sector the energy consumer with the biggest environmental impact [1]–[4]. Oil reserves are rapidly running out in the present world. Besides, oil prices have been growing steadily due to several geopolitical concerns in the world. The need for sustainable transportation has gained popularity to address issues with oil prices and environmental impact. Even when compared to more efficient conventional automobiles, the widespread usage of electric vehicles (EVs) could drastically lower greenhouse gas emissions [8]–[10]. In addition to additional benefits such as reduced noise and vibration, EVs also attain "tank-to-wheels" efficiency, which is approximately three times greater than that of cars with internal combustion engines.

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