

# Design and implementation of a lithium-ion battery management system for EVs

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The transition towards electric vehicles (EVs) is moving apace, mainly being driven by the need to remove polluting vehicles from our towns

and cities and to curb our carbon emissions by switching from fossil fuels to renewable energy sources. As more and more drivers switch to EVs, there is a pressing need to ensure that the rechargeable batteries on which they rely are running under optimal and safe conditions. Research in the *International Journal of Energy Technology and Policy* considers the design and implementation of a new type of battery-management system for the lithium-ion batteries commonly used in EVs.

Jishna Ramakrishnan, Aji Joy, and Sithara Jeyaraj of the Electronics and Communication Engineering Department at Mar Athanasius College of Engineering in Kothamangalam, Kerala, India, explain that lithium-ion batteries are currently the most advanced option for powering EVs. Lithium-ion batteries have several advantages over lead-acid and nickel-metal hydride batteries. Lithium is the lowest density metal and thus has considerable potential for greater energy capacity by weight. Lithium-ion batteries also require little maintenance when compared to some alternatives.

However, catastrophic failure can occur with this kind of battery if they are not used within the safety parameters associated with charging and discharging, operating temperature and other such factors. And, even if they do not fail catastrophically, lifespan can be limited by over-charging or complete depletion.

The team has developed a system that can monitor and take into account the various parameters to ensure optimal and safe use of EV [lithium-ion batteries](#). "The proposed system performs measurement of cell voltage, current, temperature, state of charge, state of health, remaining useful life determination, monitoring and controlling the charge and discharge characteristics and cell balancing," the team writes.

**More information:** Jishna Ramakrishnan et al, Design and implementation of a battery management system for lithium-ion

batteries in electric vehicles, *International Journal of Energy Technology and Policy* (2022). [DOI: 10.1504/IJETP.2021.121162](https://doi.org/10.1504/IJETP.2021.121162)

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