Online State-of-Health Assessment for Battery Management Systems

Abstract: Battery-powered embedded systems have known a rapid evolution in recent years, as nickel-metal hydride (Ni-MH) battery technology has enabled important reductions in size and proportional increases in total capacity over the older nickel-cadmium (Ni-Cd) and lead-acid battery types. This paper addresses the problem of state-of-health (SoH) estimation and prediction for use in resource-constrained Ni-MH-battery-powered embedded systems. We propose a novel SoH prediction methodology, presenting both a theoretical analysis of the estimation algorithm and the detailed description of hardware and software implementation. Two versions of estimation algorithms are proposed, along with the analysis of their performances in terms of prediction accuracy and required processing power, as the SoH prediction is designed to run online, being part of an embedded battery management system.

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