Battery open-circuit voltage estimation 
by a method of statistical analysis

Iryna Snihir¹
William Rey¹
Evgeny Verbitskiy²
Afifa Belfadhel-Ayeb³
Peter H.L. Notten²,³

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Abstract:

The basic task of a battery management system (BMS) is the optimal utilization of the stored energy and minimization of degradation effects. It is critical for a BMS that the State-of-Charge (SoC) is accurately determined. Open-circuit voltage (OCV) is directly related to the State-of-Charge of the battery, accurate estimation of the OCV leads to an accurate estimate of the SoC. In this paper we describe a statistical method to predict the open-circuit voltage on the basis of voltage curves obtained by charging batteries with different currents. We employ a dimension reduction method (Karhunen-Loeve expansion) and linear regression. Results of our modelling approach are independently validated in a specially designed experiment.

¹Eurandom, PO Box 513, 5600 MB Eindhoven, The Netherlands
²Philips Research, Prof. Holstlaan 4, 5656 AA Eindhoven, The Netherlands
³Eindhoven University of Technology, PO Box 513, 5600 MB Eindhoven, The Netherlands