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Supplemental information

Evaluating the feasibility of batteries for second-life applications using machine learning

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Supplemental information

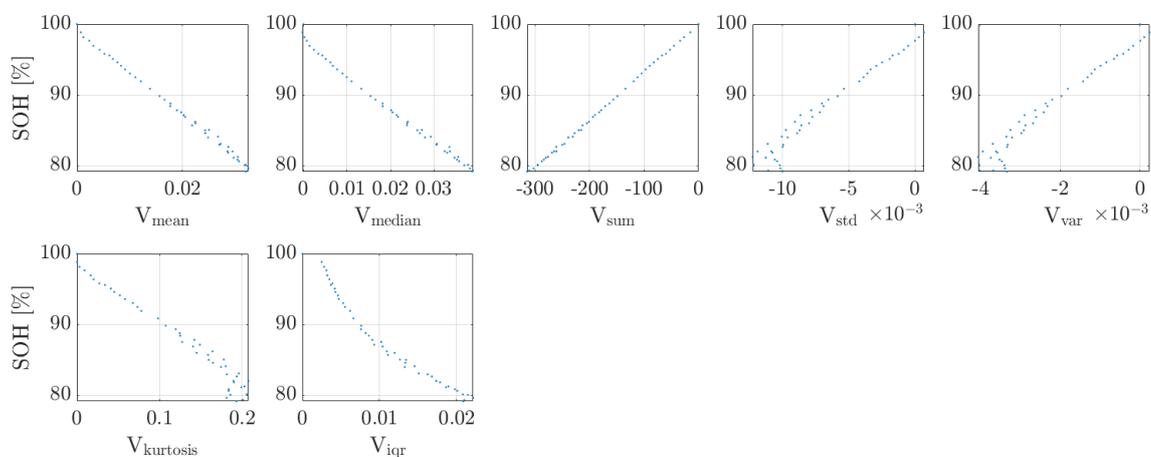


Figure S1: SOH vs. 7 features in Cell 4 of the NMC dataset,^[S1] related to Figure 3. Stronger relationships between the features and SOH were important for the model to learn the training data effectively and make strong predictions. There are no current statistics since the cells did not undergo a constant voltage portion.

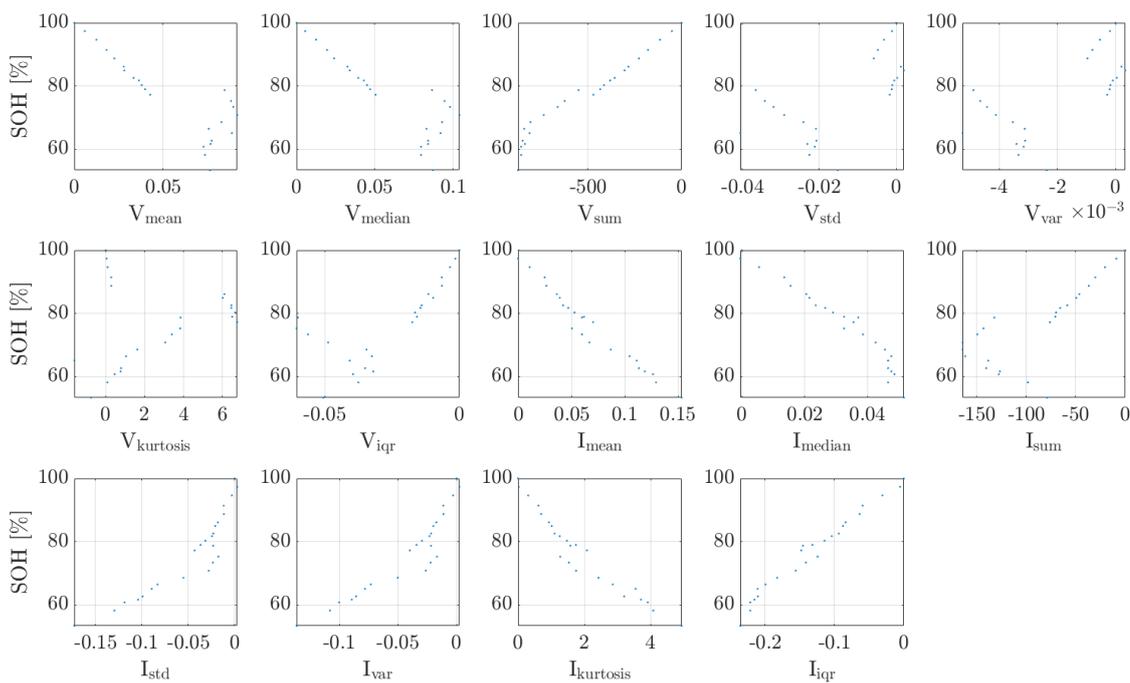


Figure S2: SOH vs. 14 features in Cell 7 of the LCO dataset,^[S2] related to Figure 3. Stronger relationships between the features and SOH were important for the model to learn the training data effectively and make strong predictions.

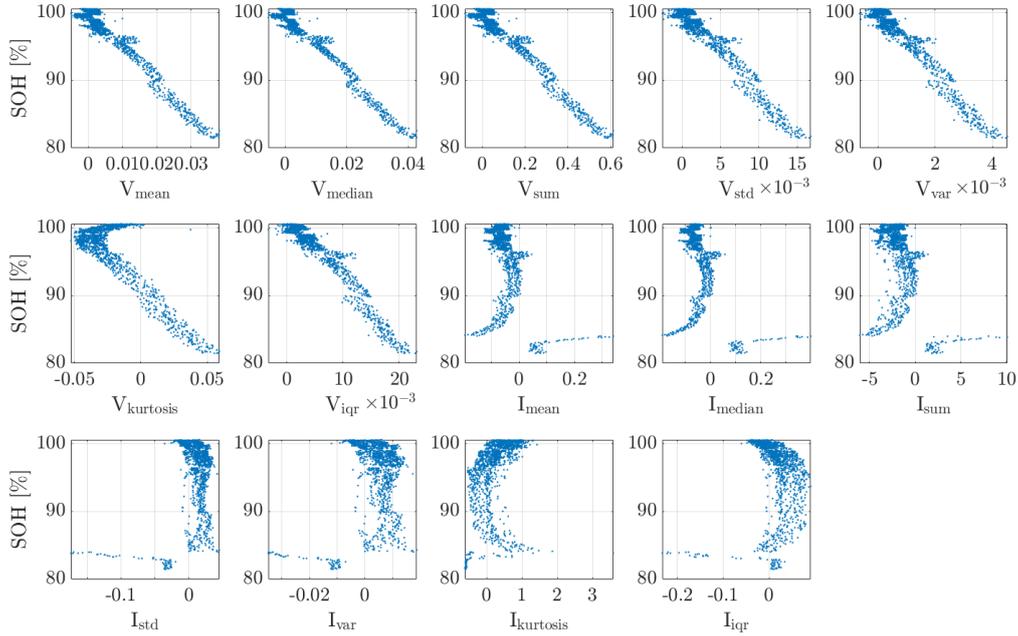


Figure S3: SOH vs. 14 features in Cell 4 of the LFP dataset,^[S3,S4] related to Figure 3. Stronger relationships between the features and SOH were important for the model to learn the training data effectively and make strong predictions

Supplemental References

[S1] Birkel, C. (2017). Oxford Battery Degradation Dataset 1. University of Oxford.

[S2] Bole, B., Kulkarni, C. S., and Daigle, M. (2014). Adaptation of an electrochemistry-based li-ion battery model to account for deterioration observed under randomized use. In Annual Conference of the PHM Society (Vol. 6, No. 1).

[S3] Severson, K.A., Attia, P.M., Jin, N., Perkins, N., Jiang, B., Yang, Z., Chen, M.H., Aykol, M., Herring, P.K., Fraggedakis, D., Bazant, M.Z., Harris, S.J., Chueh, W.C., and Braatz, R.D. (2019). Data-driven prediction of battery cycle life before capacity degradation. *Nature Energy*, 4, 383-391.

[S4] Attia, P.M., Grover, A., Jin, N., Severson, K.A., Markov, T., Liao, Y., Chen, M.H., Cheong, B., Perkins, N., Yang, Z., Herring, P.K., Aykol, M., Harris, S.J., Braatz, R.D., Ermon, S., and Chueh, W.C. (2020). Closed-loop optimization of fast-charging protocols for batteries with machine learning. *Nature*, 578, 397-402.