Project Outputs

Research Articles

[1] **Ian D. Campbell**, **Krishnakumar Gopalakrishnan**, Monica Marinescu, Marcello Torchio, Gregory J. Offer and Davide M. Raimondo. *"Optimising lithium-ion cell design for plug-in hybrid and battery electric vehicles"*. *Journal of Energy Storage* 22 (Apr. 2019), pp. 228–238. ISSN: 2352-152X. DOI: 10.1016/j.est.2019.01.006. *The highlighted authors are official joint first authors with equal contributions.*

[2] Krishnakumar Gopalakrishnan, Teng Zhang and Gregory J. Offer. *"A Fast, Memory-Efficient Discrete-Time Realization Algorithm for Reduced-Order Li-Ion Battery Models"*. *Journal of Electrochemical Energy Conversion and Storage* 14.1 (Feb. 2017), p. 011001. ISSN: 2381-6872. DOI: 10.1115/1.4035526.

[3] Andrea Pozzi, Gabriele Ciaramella, Krishnakumar Gopalakrishnan, Stefan Volkwein and Davide M. Raimondo. *"Optimal Design of Experiment for Parameter Estimation of a Single Particle Model for Lithiumion Batteries"*. *2018 IEEE Conference on Decision and Control (CDC)*. Dec. 2018, pp. 6482–6487. DOI: 10.1109/CDC.2018.8619340.

[4] Krishnakumar Gopalakrishnan and Gregory J. Offer. *"An Electrolyte Enhanced Composite Single Particle Model using System Identification Techniques"*. *IEEE Transactions on Sustainable Energy (manuscript in preparation)* (2018).

Conference Presentations

[1] Ian D. Campbell, Krishnakumar Gopalakrishnan, Monica Marinescu, Marcello Torchio and Davide M. Raimondo. *"Optimising Lithium-ion Cell Design for Plug-in Hybrid and Battery Electric Vehicles"*. *UK Energy Storage Conference (UKES)*. Newcastle, UK, 2018. Presented by Ian D. Campbell.

[2] Ian D. Campbell, Krishnakumar Gopalakrishnan, Monica Marinescu, Marcello Torchio, Gregory J. Offer and Davide M. Raimondo. *"Optimised Cell Layer Configurations via Modelling: Common Module Design for Electric Vehicle Platforms"*. *WMG/JLR-Catapult Energy Storage Conference 2017*. Coventry, UK, 2017. Presented by Ian D. Campbell.

[3] Krishnakumar Gopalakrishnan, Teng Zhang and Gregory J. Offer. *"A Fast, Efficient Discrete-Time Realization Algorithm for Reduced-order Battery Models"*. *13th Symposium On Modeling & Experimental Validation Of Fuel Cells, Batteries & Electrolysers*. Lausanne: Swiss Federal Energy Office, 2016. URL: https://modval13.epfl.ch/.

[4] Krishnakumar Gopalakrishnan, Teng Zhang and Gregory J. Offer. *"A Fast, Efficient Discrete-Time Realization Algorithm for Reduced-Order Battery Models"*. *Meeting Abstracts of the Electrochemical Society (ECS)*. Vol. MA2016-03. 2. June 2016, pp. 844–844. URL: http://ma.ecsdl.org/content/MA2016-03/2/844.short.

[5] Wasim Sarwar, Gregory J. Offer, Krishnakumar Gopalakrishnan and Nick Green. *"Combined Battery/Supercapacitor Hybridised Energy Storage Systems for Hybrid Electric Vehicles"*. *Meeting Abstracts of the Electrochemical Society (ECS)*. Vol. MA2016-03. 2. Chicago, IL: The Electrochemical Society, June 2016, pp. 443–443. URL: http://ma.ec sdl.org/content/MA2016-03/2/443.short. Presented by Wasim Sarwar.

Posters

[1] Krishnakumar Gopalakrishnan, Ian D. Campbell, Monica Marinescu, Marcello Torchio, Gregory J. Offer and Davide M. Raimondo. *"Optimising lithium-ion cell design for plug-in hybrid and battery electric vehicles"*. *15th Symposium on Modeling and Validation of Electrochemical Energy Devices, ModVal 2018*. Ed. by Erik J. Berg, Felix N. Büchi, Jens Eller and Lorenz Gubler. Aarau, Switzerland: Electrochemistry Laboratory, Paul Scherrer Institut PSI, Apr. 2018, p. 160. DOI: 10.3929/ETHZ-B-000240521. Created by Ian D. Campbell and presented by Monica Marinescu.

[2] Ian D. Campbell, Krishnakumar Gopalakrishnan, Monica Marinescu, Marcello Torchio, Gregory J. Offer and Davide M. Raimondo. *"Optimising Li-ion Cell Layers Rapid Cell Design For EV Fast Charging"*. *Kraftwerk Batterie Advanced Battery Power Batterietagung 2018*. Münster, Germany: Haus Der Technik E.V., 2018. URL: http://2018.battery-p ower.eu/en/. Created and presented by Ian D. Campbell.

[3] Ian D. Campbell, Krishnakumar Gopalakrishnan, Yatish Patel and Gregory J. Offer. *Reducing Li-ion Degradation with Applied Compression*. Solihull, UK, 2017. URL: https: //futurepowertrains.co.uk/2017/. Created and presented by Ian D. Campbell.

[4] Wasim Sarwar, Gregory J. Offer, Krishnakumar Gopalakrishnan and Nick Green. *"Combined Battery/Supercapacitor Hybridised Energy Storage Systems for Hybrid Electric Vehicles"*. *18th International Meeting on Lithium Batteries (IMLB)*. Chicago, IL: The Electrochemical Society (ECS), June 2016. URL: https://ecs.confex.com/ecs/iml b2016/webprogram/Paper78263.html. Created and presented by Wasim Sarwar.

Computer Software

[1] Battery Optimal Layer Design (BOLD) toolbox (in MATLAB). Co-created by this thesis author along with Ian D. Campbell and Davide M. Raimondo. All three authors contributed equally to this toolbox. DOI: https://doi.org/10.5281/zenodo.1016405. MIT license. ⚙ https://github.com/ImperialCollegeESE/BOLD_Toolbox.

[2] Finite volume codes (in Python) for numerical simulation of Pseudo Two-Dimensional (P2D) lithium ion battery model. Co-created in equal parts by this thesis author and Ian D. Campbell. Available upon request.