Summary of this course

- Have seen good and bad ways to estimate SOC for all cells
- Model-based methods are preferred; KF-based methods are "optimal" in some sense
- Additionally, KF estimates entire state—not only SOC—therefore can also be used for conservative power-limits estimates, etc.
- Lots of nuances unexplored in this short course
  - Can invest a lifetime to studying KF and applications!
- Our next step is to look at state-of-health estimation, which is a form of parameter estimation

Decision point

- This brings us to the end of the non-honors version of course 3 in the BMS algorithms specialization
- Decision point:
  - Honors track has one more week in course 3, looking into real-world issues regarding implementing model-based estimators on full-scale battery packs
  - Remaining courses focus on how to estimate battery state-of-health, and how to control battery operation

Where from here?

- Course 4 focusses on state-of-health estimation
  - How do battery cells degrade?
  - The difficulty of estimating capacity loss, and problems with "standard" ordinary least-squares regression to do so
  - An improved method using total least-squares and some approximations
  - How to extend nonlinear Kalman filtering theory to estimate time-varying model parameters as well as model state

Credits

Credits for photos in this lesson

- Fork in road on slide 2: By Mark Turnauckas, [CC BY 2.0 (https://creativecommons.org/licenses/by/2.0/)], https://www.flickr.com/photos/marktee/5923492105