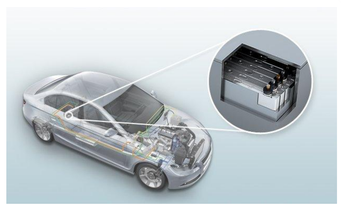
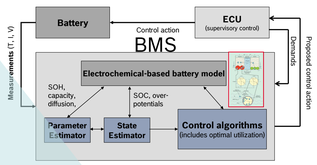
Advanced Battery Management System (ABMS)*

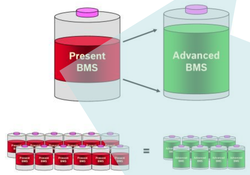
Benefits of ABMS



Advanced BMS



Available capacity



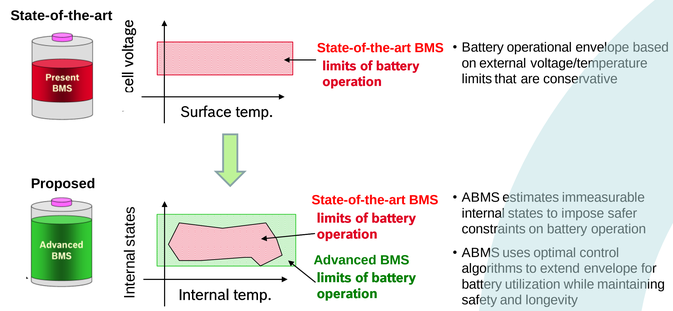
Performance Benefits

- Reduce cost of batteries > 25% by increasing the envelope of battery operation
- Reduce charge time by more than 50%, enable higher penetration of EVs

Performance Targets

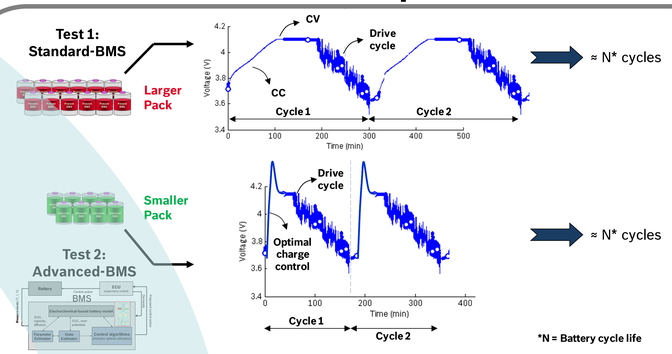
Metric	State of the Art	Proposed
Cost of battery pack	$10,000	$7,500
Charge time from 0% to 80% capacity	30 min to 3 hrs	< 15 min
Available capacity	100%	125% – 133%

Technology/Concept behind ABMS

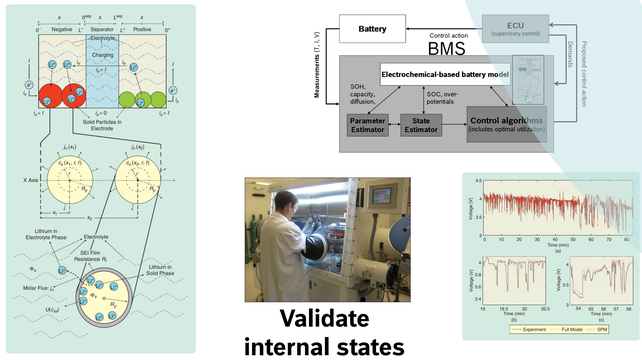


- Battery operational envelope based on external voltage/temperature limits that are conservative
- ABMS estimates immeasurable internal states to impose safer constraints on battery operation
- ABMS uses optimal control algorithms to extend envelope for battery utilization while maintaining safety and longevity

Validation of BMS performance

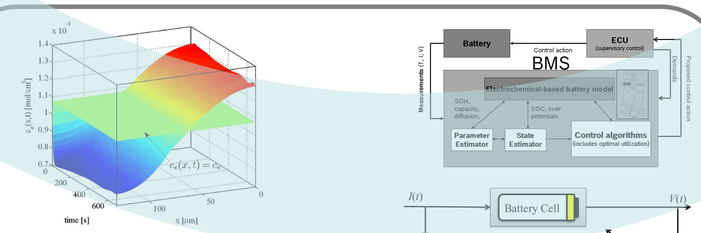


Test Advanced BMS performance vs. Standard BMS

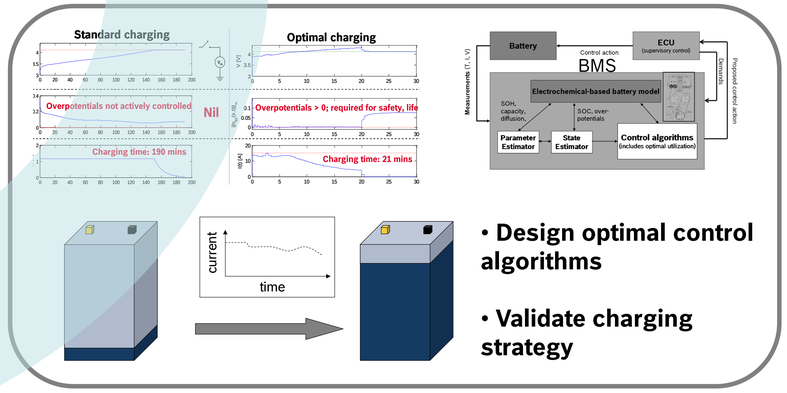


Validate internal states

Electrochemical model validation



State and parameter estimators



- Design optimal control algorithms
- Validate charging strategy

Optimal charging strategy

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