



EXPANSION OF BATTERY ARCHIVE – A PUBLIC DATA REPOSITORY FOR ENERGY STORAGE EVALUATION

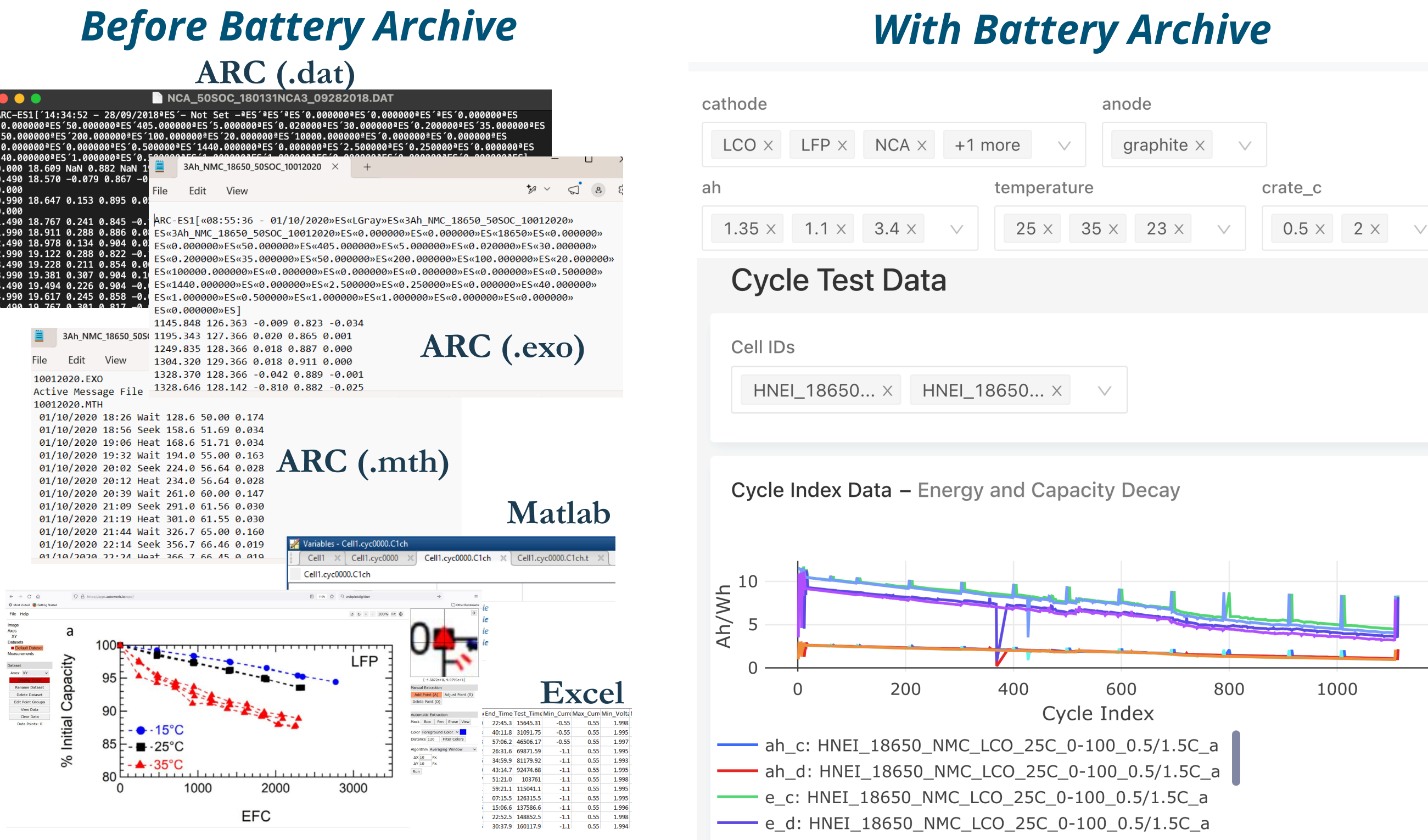
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PROJECT PROFILE

Topic: Safety & Reliability| Vertical: Safety & Reliability
Strategic Pathway: Stabilize
Project start and finish: FY26

PROBLEM

Energy storage stakeholders require battery data to improve system performance and inform standards, but it is difficult to access, even from publicly funded studies. Battery Archive (BA) collects and standardizes battery data in a public, accessible space. Significant amounts of standardized data are needed to support AI/ML for predictive safety.



APPROACH

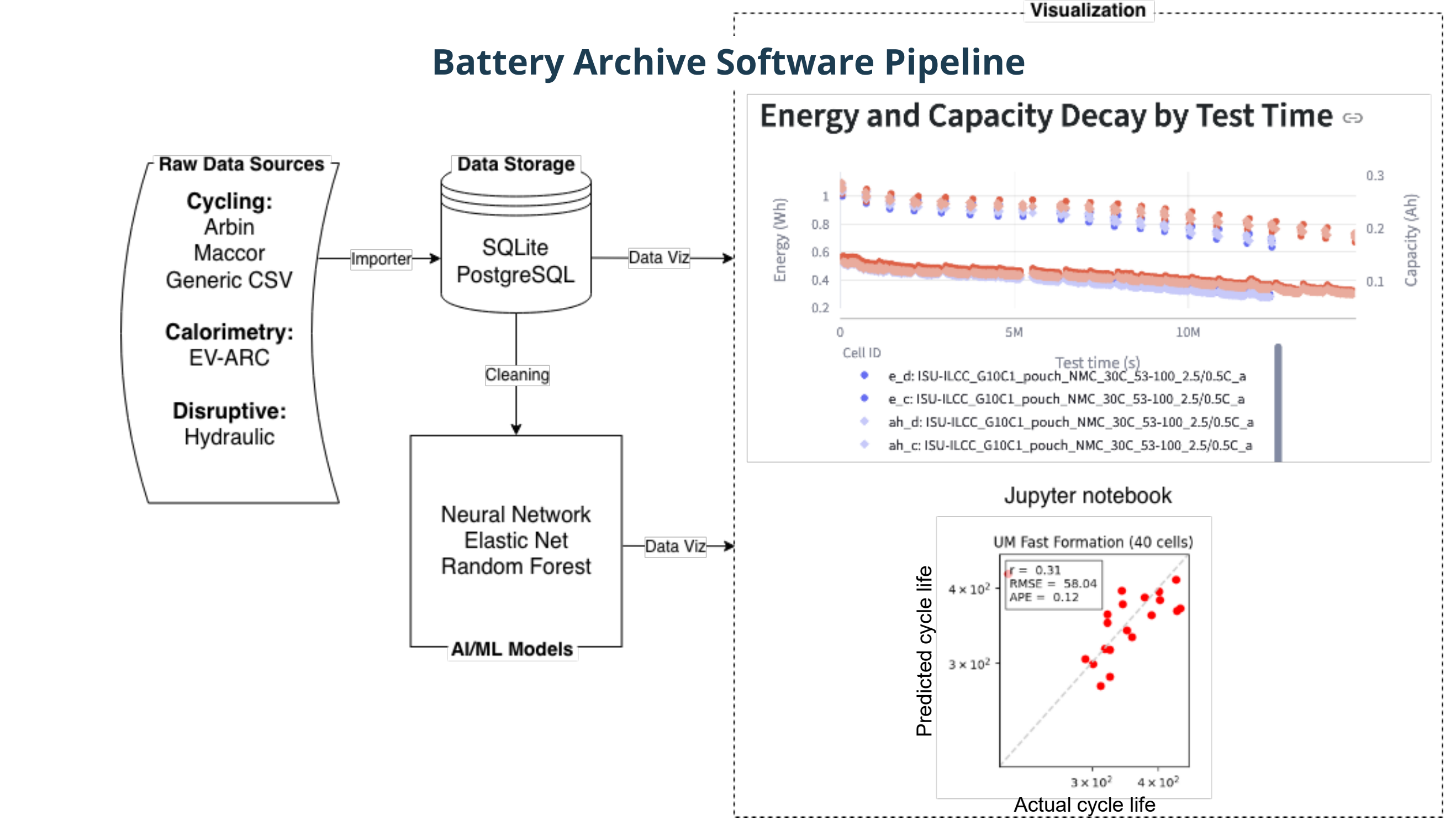
Battery Archive previously had importers, databases, and visualizations for cell + module cycling and mechanical indentation data, and a separate codebase for machine learning for cycle life prediction. This year, we added two key features:

Accelerated Rate Calorimetry (ARC) Data

ARC is a common test to collect precise data on the kinetics and thermodynamics of battery thermal runaway. It enables cell-level safety comparisons and system-level engineering.

Integrated ML Pipeline

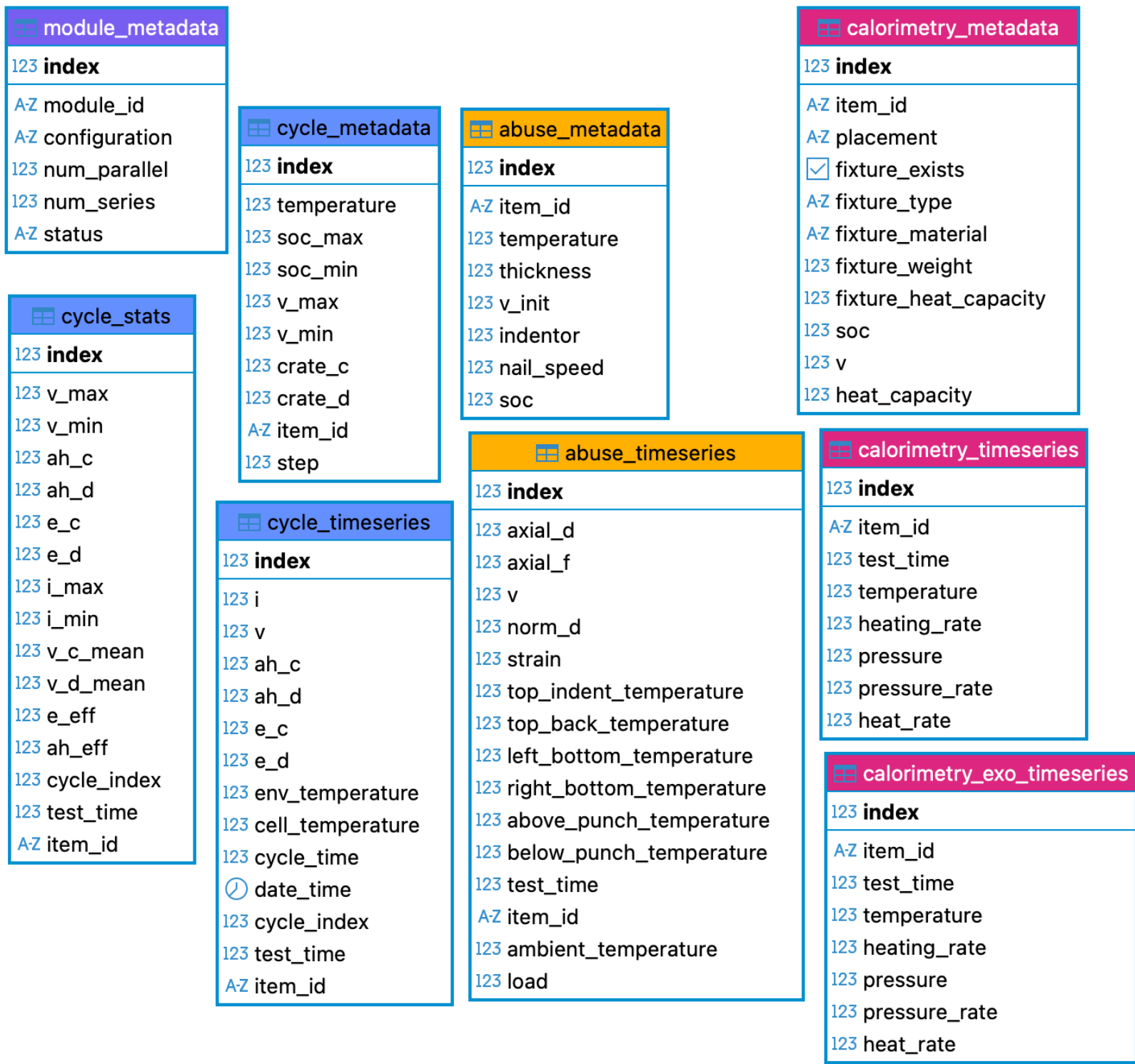
Integrating the ML codebase directly with the BA database allows users to train directly on the growing number of datasets in BA.



RESULTS

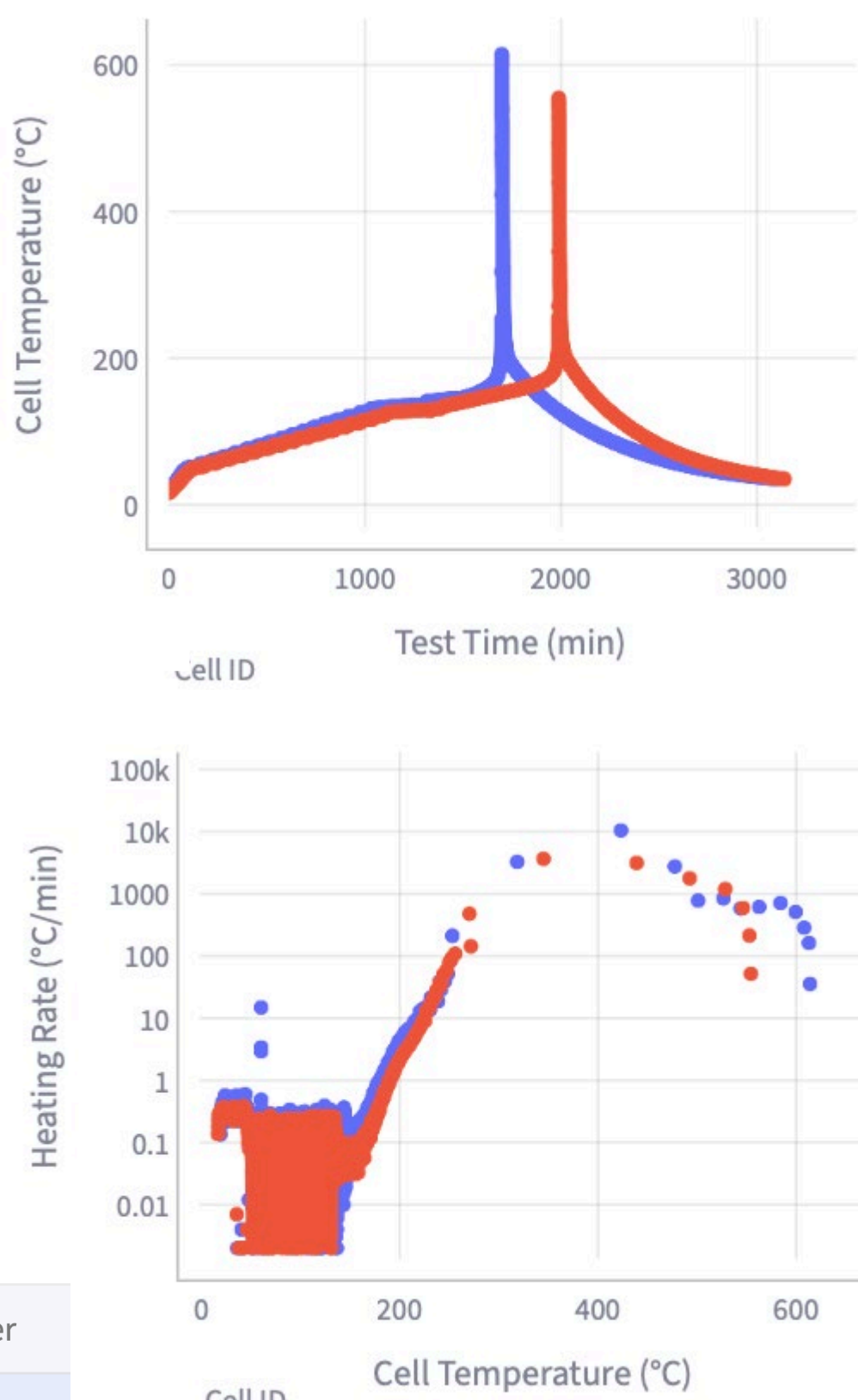
The full software restructure simplified the process to add new data types to Battery Archive. The new architecture enabled a seamless single-week expansion for calorimetry data.

Schema for all data types



Calorimetry visualization dashboard

Comparison of thermal runaway of NCA and NMC cells at 50% SOC.



Calorimetry cell selection dashboard

☒	Cell ID	Anode	Cathode	Source	Ah	Form Factor	SOC	Tester
☒	SNL_NCA_graphite_3.2Ah	graphite	NCA	snl	3	18650	50.0	EV-ARC
☒	SNL_NMC_anode_3Ah_50S	graphite	NMC	snl	3	18650	50.0	EV-ARC

CONCLUSIONS & IMPACT

Industry stakeholders now have access to calorimetry data to advance battery safety and tools to predict cycle life on data in BA.



Individuals contributing to battery safety standards have already requested data on thermal runaway at different SOC's to inform guidance.



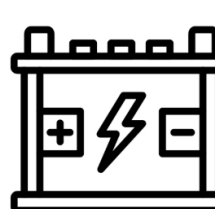
Since launch, the broader BA public site has been used by 60K+ from high schoolers to utility and Fortune 500 employees. Having a standardized repository of public battery data has conservatively generated at least \$250 million worth of value to users (based on cost of users generating similar data with a typical testing lab).

FUTURE DIRECTIONS

We will expand the Battery Archive public site to additional classes of data and prediction tools, notably:



Non-calorimetry battery safety data
> Inform standards, support predictive safety



Performance data for commercial batteries using abundant, low-cost materials
> Early raw data to developers/investors accustomed to Li-ion