LITHIUM-ION BATTERY RECYCLING PRIZE

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Submission Title:	Smart Battery Sorting System
Submission Track:	Separation and Sorting

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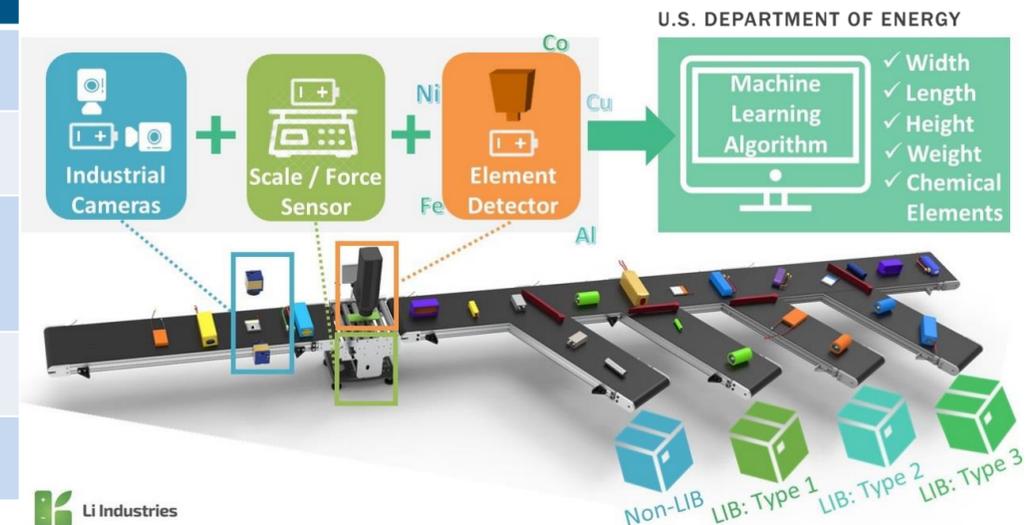
Concept

- Sorting is critical to the advancement of more efficient and prevalent lithium ion battery recycling.
- Current sorting technologies are limited in their ability to categorize and sort lithium ion batteries based on their constituent materials, and manual sorting methods are slow, costly, and rely on the expertise of individuals to sort properly.
- An automated sorting technology is needed that is able to sort batteries by their constituent materials, particularly their cathode composition, as well as other important characteristics such as size, shape, weight, and/or types of packaging.

Approach

- Our Smart Battery Sorting System automates battery sorting by utilizing machine learning coupled with inline physical and chemical property measurements, a more economical and accurate alternative to currently available sorting processes.
- The system is capable of sorting and separating batteries by a number of characteristics, including cathode composition, size, shape, weight, and/or types of packaging.
- The machine learning capabilities of the system enable improvement in accuracy of sorting over time, as well as the flexibility to sort new types of batteries as needed.

Potential Impact

- Developing an economical and effective sorting method for batteries facilitates the advancement of direct battery recycling methods, which require separation of batteries by their material composition to be effective.
- Direct battery recycling methods are superior to current recycling technologies. They recycle and rejuvenate cathode and anode materials directly without needing to decompose these materials into their constituent elements.
- The sorting process market has the potential to reach $205 million by 2030 and can support technologies that are able to meet the Department of Energy's goal of achieving a 90% recycling rate.