

Title	Visual data mining of rechargeable lithium-ion battery deterioration characteristics
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Author	水口, 晋(Mizuguchi, Susumu) 小木, 哲朗(Ogi, Tetsuro)
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Abstract	<p>With the wide spread of Electric Vehicles(EV) and its potential for reusability, the secondary use of in-car Lithium Ion Batteries has become significantly important. In order to realize the secondary use of in-car Li+B batteries, it is required to understand how the deterioration of battery can be analyzed through a set of running data. The deterioration of batteries will occur from time to time, thus, it is necessary to measure by multiple points for accurate speculation.</p> <p>The data sets of EV running data are large in volume and high in complexity, and visual data mining (VDM) application is implemented for analysis. The application enables stereovision three-dimensional data representation on a set of super high-definition 4K Displays. Data sets are visualized as holistic view, and selected with selected data range and calculate the statistical value at selected data range.</p> <p>Using the VDM application, stable windows of internal resistance were found. There found more than dozens of data points identified at running state after full charge. Plots of those data points in chronological sequence showed the deterioration progress. The data filtering logic for finding internal resistance proved that it can be accounted as deterioration indicator and be applied to deterioration speculation.</p>
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Visual Data Mining of Rechargeable Lithium -Ion Battery
Deterioration Characteristics

Susumu Mizuguchi
(Student ID Number : 81033514)

Supervisor Tetsuro Ogi

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Graduate School of System Design and Management,
Keio University
Major in System Design and Management

SUMMARY OF MASTER'S DISSERTATION

Student Identification Number	81033514	Name	Susumu Mizuguchi
Title: “Visual Data Mining of Rechargeable Lithium - Ion Battery Deterioration Characteristics”			
<p>Abstract:</p> <p>With the wide spread of Electric Vehicles(EV) and its potential for reusability, the secondary use of in-car Lithium Ion Batteries has become significantly important. In order to realize the secondary use of in-car Li+B batteries, it is required to understand how the deterioration of battery can be analyzed through a set of running data. The deterioration of batteries will occur from time to time, thus, it is necessary to measure by multiple points for accurate speculation.</p> <p>The data sets of EV running data are large in volume and high in complexity, and visual data mining (VDM) application is implemented for analysis. The application enables stereovision three-dimensional data representation on a set of super high-definition 4K Displays. Data sets are visualized as holistic view, and selected with selected data range and calculate the statistical value at selected data range.</p> <p>Using the VDM application, stable windows of internal resistance were found. There found more than dozens of data points identified at running state after full charge. Plots of those data points in chronological sequence showed the deterioration progress. The data filtering logic for finding internal resistance proved that it can be accounted as deterioration indicator and be applied to deterioration speculation.</p>			
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