Thesis Portfolio

Modular Battery Management System
(Technical Report)

The Social Construction of Space and the Space Community
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science
University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree
Bachelor of Science, School of Engineering

Nikilesh Subramaniam
Spring, 2021

Department of Electrical and Computer Engineering

Table of Contents

Sociotechnical Synthesis

Our technical topic is to create a modular battery management system (BMS) for lithium ion batteries used in electric vehicles. This BMS will be able to monitor cell currents and voltages and estimate the state of charge and state of health of the battery cells. The management system will use fans to prevent cell overheating and use relays to prevent the batteries from overcharging or over-discharging. This BMS will be modular allowing users to use the same BMS for different battery pack sizes instead of buying a new BMS every time their battery pack size changes. As a result, this project will reduce the waste generated from buying multiple BMS designs. Additionally, this project can increase adoption of electric vehicles which will reduce the overall carbon footprint used in transportation.

My STS topic is to analyze how the imagination of space society and space technology has changed since the start of the Space Race in 1958 to the present. During the Space Race there was fierce competition in space. Since then, international cooperation has increased and private space companies have grown. I will analyze the change in space society using the social construction of technology framework. The technical subject of the STS prospectus and the technical topic for the Dept. of Electrical and Computer Engineering is not related.