Abstract

Designing battery management and maintenance systems is a complex process and involves numerous challenges. These complex engineering tasks are carried out through the application of new methods, ideas, technologies and feedback from the manufacturers, customers and users.

In my thesis I have thoroughly examined the national (Hungarian) and international literature, European and Asian maintenance processes and soft computing methods. This research work and personal impression were helpful during my work.

The dissertation investigates the most popular battery and non-battery-powered Unmanned Ground Vehicles (UGV) and Automated Guided Vehicles (AGV) in military and industrial fields. The first part of the PhD thesis describes a possible classification of UGVs and AGVs. This classification is useful to determine a new operation method. The operation sets are very important for the maintenance groups and also for the popular "lean" principles.

My work shows the main properties of lithium-polymer batteries which is the main target of this study. I illustrated the battery parameters and parameter deviations/uncertainties with Fuzzy logic in 2D and 3D figures with MATLAB®. The results are not satisfying. The last chapters contain a Fuzzy logic and Support Vector Machine (SVM) analysis of the batteries' parameters.