



**Michigan
Technological
University**

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DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING – ENGINEERING MECHANICS

INTRODUCTION



With a joint appointment between ECE (2/3) and MEEM department (1/3), my activities bridge interests between both departments on energy storage topics for transportation and grid applications.

OBJECTIVES FOR USE OF FUNDS

The funding this year started in February 2019, so I will present here what has been done up to date and what will be done beyond the reporting date of June 30th with the funds.

My objective for the endowment is to support research activities that are either exploratory to identify new areas for funding or research activities that develop from existing projects. My goal for the use of funds is targeted towards supporting the students performing research. This year it is being used:

1. To support an ECE Ph.D. student during the summer that is graduating this fall, and that was working in the NSF CAREER Award before the new student arrived. His objectives while being supported by the Henes endowment is to work on publishing two more journal articles and writing his dissertation. His work is in collaboration with another ECE faculty member (Sumit Paudyal), and the work is in line with a project being written up during the summer to collaborate with Ford. Therefore, advancing this work during this summer is key for the proposal with Ford. One of the manuscripts will be submitted in the next couple of week, and he will work on the second one the rest of the summer. He is also working on a conference presentation to PES General Meeting 2019, which is a very competitive conference to be accepted for presentation.
2. To support a new avenue of work with a collaboration with Iowa State University on designing a battery-flywheel hybrid energy storage system for an aerospace application. It is a satellite that requires energy storage for when the solar energy is not available. This new avenue is being explored by supporting an ME-EM Ph.D. student that is here at MTU, as the Iowa State Univ. faculty member was a MTU faculty member before leaving to Iowa (Ossama Abdelkhalik). The student will be supported during the summer. The topic is a more energy-oriented project for the student than the controls-oriented Ph.D. research he works on with his advisor. The objective is for the student to be able to write a journal article as an output of the work. In this way, we can have a traceable collaboration and a seed of work that can be leveraged later on.