The objectives of this project are threefold:

(*) First, I will build a research foundation in data science and analytics. As part of this effort, I will study recent work on recommendations based on title, descriptions, and images, and read and report on related efforts from the literature. I will complement this effort with practical skills development with modern tools like Python, Tensorflow, and Neural Networks.

(*) Second, I will design and implement new mining approaches for extracting high level features from text and image data. I will look at these recommendations for electronics, and I will define the definition of compatibility which is proper for electronics. I will then build a model based on this new definition. This will require new work on my part in understanding cutting-edge tools and in developing adaptations of existing recommendation systems (e.g., matrix factorization, collaborative filtering).

(*) Third, I will demonstrate and evaluate my research progress through a demo. I will define a new way to quantitatively measure compatibility and compare to existing state-of-the-art recommendation systems.

Deliverables:

(*) Presentation slides to be delivered to Prof. Caverlee and his research lab outlining my progress and its relation to existing work.
(*) Code and supporting documentation for new definition of compatibility which is proper for electronics that I will develop.
(*) A published written report (in the style of an ACM conference paper) detailing my methods.
(*) An end-of-semester demo.
(*) As a participant in the Undergraduate Research Scholars Program, I will prepare a thesis and participate in a Scholar's symposium, where I will present the results of my thesis.