

CRE Faculty Name: Bruce Pell

Project Title: Computational Essays for Linear Algebra

CRE Course: MCS 3863 - Linear Algebra

Student Researcher Name and Major: Cristina Wallace (Major: Mathematics, Minor: Physics)

CRE Project Description: Linear algebra is the branch of mathematics concerning systems of linear systems, linear functions and their abstract, but useful representations. It is central to almost all areas of mathematics and has many applications to computer science, applied mathematics, physics and engineering. Often times, an application of linear algebra requires computational software since the number of calculations is so large that it is infeasible to do by hand. However, this skillset of using computational software to perform linear algebra calculations is not officially present in the course topics for MCS 3863.

This project was directed at the development and modernization of MCS 3863 by creating computational essays in MATLAB to expose and teach students the modern implementations of linear algebra concepts. The subject matter of the computational essays covered a wide range of linear algebra applications and exposed students to the big ideas that are found in, but not limited to: data science, machine learning, image and data compression, text mining, principal component analysis and linear regression.

For the full reports, click [HERE](#).