Shantel Perez

Singular Value Decomposition (SVD) is an important topic in Linear Algebra that has many applications in different fields such as image processing, signal processing, data analysis, and machine learning. SVD is used to decompose a matrix into its constituent parts, making it possible to extract meaningful information from data sets that might be otherwise difficult to analyze. SVD provides a powerful tool for dimensionality reduction, noise reduction, data compression, and data visualization. Moreover, SVD plays a crucial role in solving linear systems of equations, least squares problems, and eigenvalue problems. Overall, SVD is a versatile and fundamental tool in Linear Algebra that has numerous practical applications, making it an interesting and important topic to study.

Mathematical Topic: Singular Value Decomposition (SVD) in Linear Algebra

II. Field to which Mathematics is Connected: Image Processing

III. Proposed list of at least SIX Resources:

1. Golub, G. H., & Van Loan, C. F. (2013). Matrix computations (Vol. 3). JHU Press.
2. Trefethen, L. N., & Bau III, D. (1997). Numerical linear algebra. SIAM.
3. Hansen, P. C. (2005). Rank-deficient and discrete ill-posed problems: numerical aspects of linear inversion. SIAM.
4. Strang, G. (2019). Linear algebra and learning from data. Wellesley-Cambridge Press.
5. Szeliski, R. (2010). Computer vision: algorithms and applications. Springer Science & Business Media.
6. Fornasier, M., & Rauhut, H. (2010). Compressive sensing. Springer.