

Image Denoising via Low-Rank Approximation and Optimal Hard Thresholding

MAT 167 - Applied Linear Algebra

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Overview

1. Theory
2. Easy Application - Kingfisher
3. Hard Application - Medical Imaging

Singular Value Decomposition

- Suppose we want to decompose a matrix in a way similar to Eigenvalue decomposition, however, without the stipulation that the matrix must be invertible.
- Singular value decomposition provides ability to generalize from $A = \Phi \Lambda \Phi^{-1}$ to $A = U \Sigma V^T$
- For a given matrix A which is size $m \times n$, U is the left unitary matrix forming an orthonormal basis for \mathbb{R}^m while V is the right unitary matrix forming an orthonormal basis for \mathbb{R}^n
- Σ is an $m \times n$ diagonal matrix of the singular values where $\sigma_1 \geq \sigma_2 \geq \sigma_n$

Blocks of Highlighted Text

In this slide, some important text will be **highlighted** because it's important. Please, don't abuse it.

Block

Sample text

Alertblock

Sample text in red box

Examples

Sample text in green box. The title of the block is "Examples".

Multiple Columns

Heading

1. Statement
2. Explanation
3. Example

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Table

Treatments	Response 1	Response 2
Treatment 1	0.0003262	0.562
Treatment 2	0.0015681	0.910
Treatment 3	0.0009271	0.296

Table: Table caption

Theorem

Theorem (Mass–energy equivalence)

$$E = mc^2$$

Figure

Uncomment the code on this slide to include your own image from the same directory as the template .TeX file.

An example of the `\cite` command to cite within the presentation:

This statement requires citation.

References

The End