

# Fourier Transforms

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# Fourier Series

# Applications

- ▶ Data compression

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- ▶ Partial Differential Equations

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- ▶ Data compression
- ▶ Partial Differential Equations
- ▶ A lot of stuff.

# Fourier Transforms

- ▶ Complex input
  - ▶ Hermitian matrix
$$A = \bar{A}^T$$
  - ▶ Conjugate transpose
$$\bar{A}^T$$
  - ▶ Unitary
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$$U * U = I$$
- ▶ Algorithms
  - ▶ Fast Fourier Transform (FFT)
  - ▶ Discrete Fourier Transform (DFT)