Discrete Fourier transform (DFT) and its inverse

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 Discrete Fourier transform (DFT) and its inverse: terminology and notation

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- Discrete Fourier transform (DFT) and its inverse: terminology and notation
- Interpretation of DFT (spectrum)

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Magnitude and phase spectra

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Magnitude and phase spectra; symmetries

- Discrete Fourier transform (DFT) and its inverse: terminology and notation
- Interpretation of DFT (spectrum)
- DFT of a real-valued signal: characteristic property (conjugate circular symmetry)
- Magnitude and phase spectra; symmetries
- Synthesis of a real-valued signal using its magnitude and phase spectra

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• V:  $N \times N$  matrix with orthogonal columns

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- $k^{\rm th}$  column of V: complex sinusoid of frequency  $k(2\pi/N)$

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, where  $z = e^{j(2\pi/N)}$ 

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• Synthesis Equation:

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• *Synthesis* Equation:

$$\mathbf{s} = \mathbf{V}\mathbf{c}$$

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$$\mathbf{s} = \mathbf{V}\mathbf{c} = \frac{1}{N}\mathbf{V}\mathbf{S}$$

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$$\bullet \qquad ({\sf Time}) \ {\bf s} \ \longleftrightarrow \ {\bf S} \ ({\sf Frequency})$$

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