

Exercise Sheet 7

Kurtosis, negentropy, and the independent components of image patches

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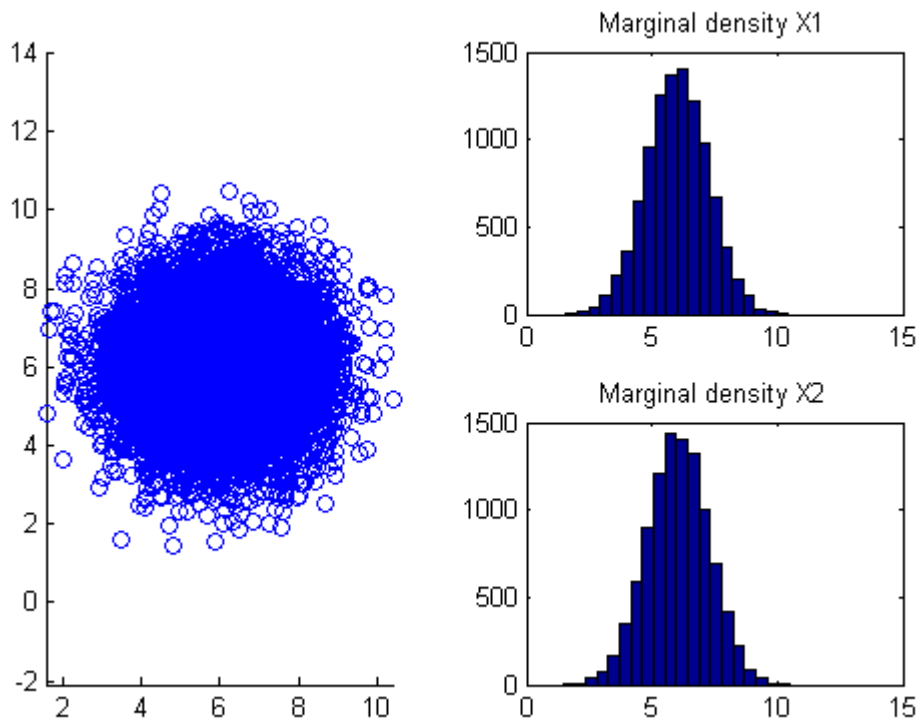
Problem 7.1

Kurtosis Toy Data

Problem 7.1 Kurtosis Toy Data

Loaded datasets

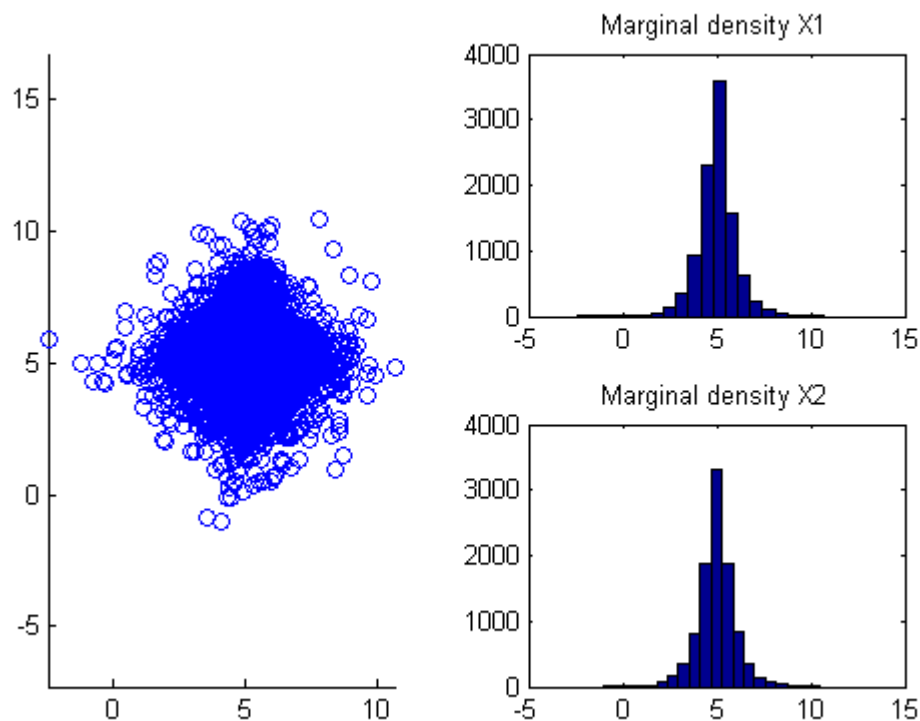
Normal distribution



Problem 7.1 Kurtosis Toy Data

Loaded datasets

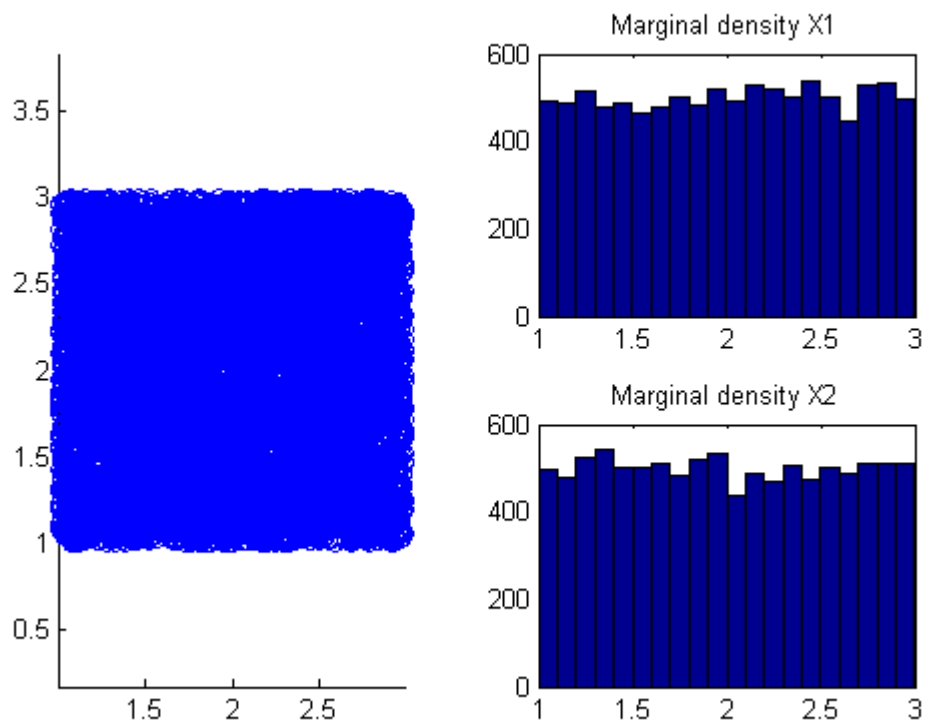
Laplacian distribution



Problem 7.1 Kurtosis Toy Data

Loaded datasets

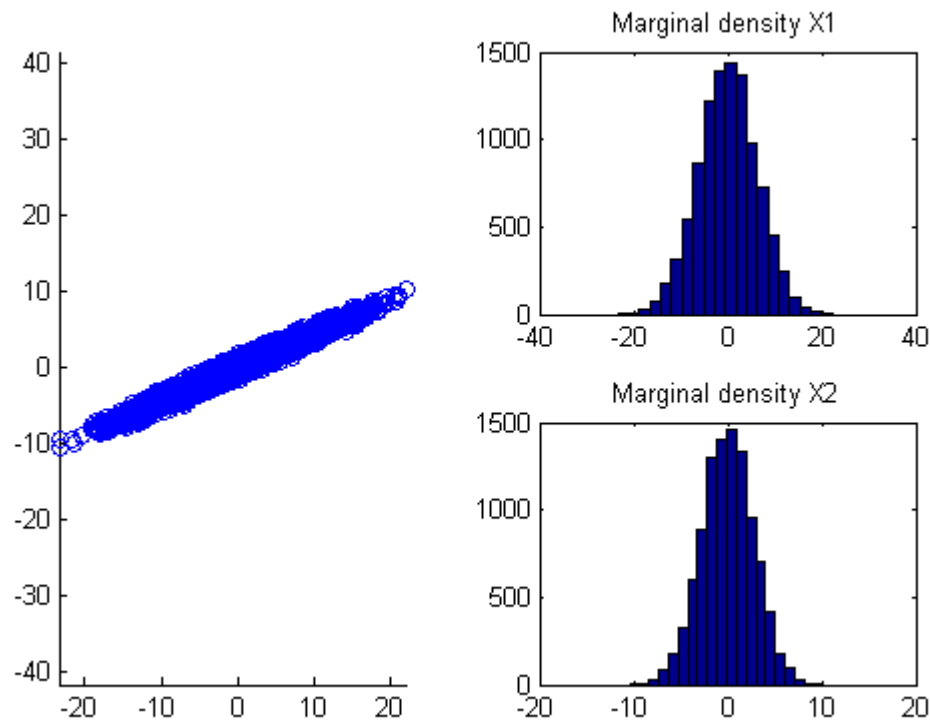
Uniform distribution



Problem 7.1 Kurtosis Toy Data

Mixed data

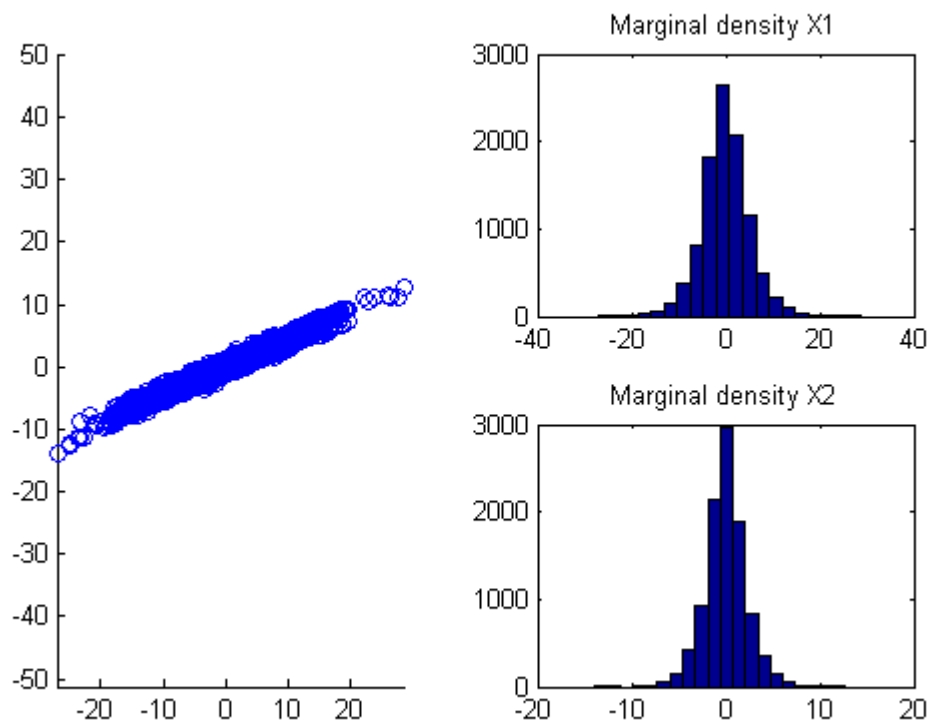
Mixed centered normal distribution



Problem 7.1 Kurtosis Toy Data

Mixed data

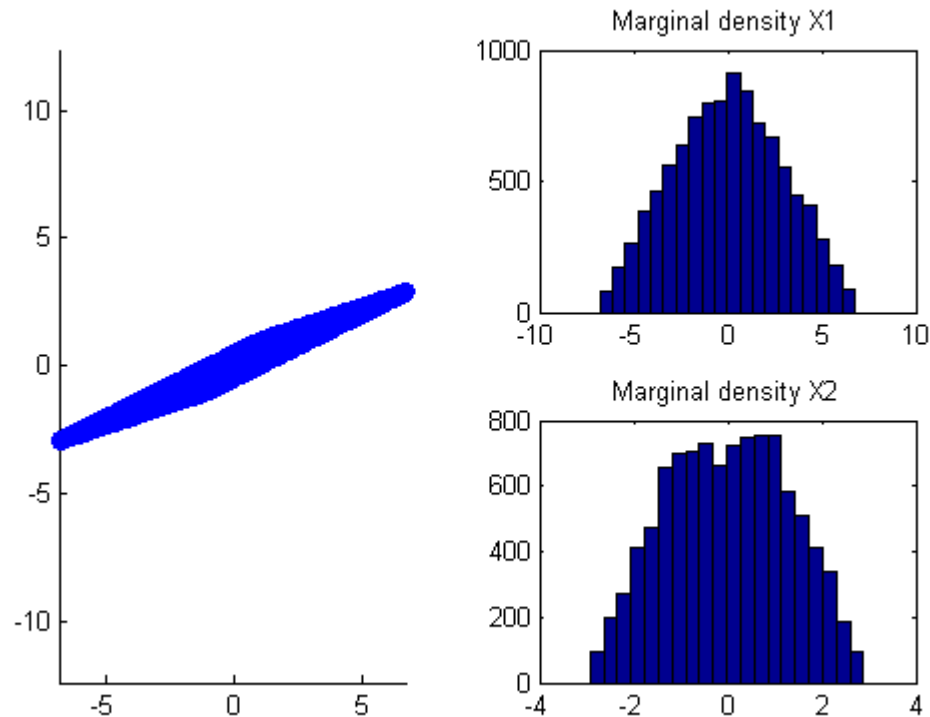
Mixed centered laplacian distribution



Problem 7.1 Kurtosis Toy Data

Mixed data

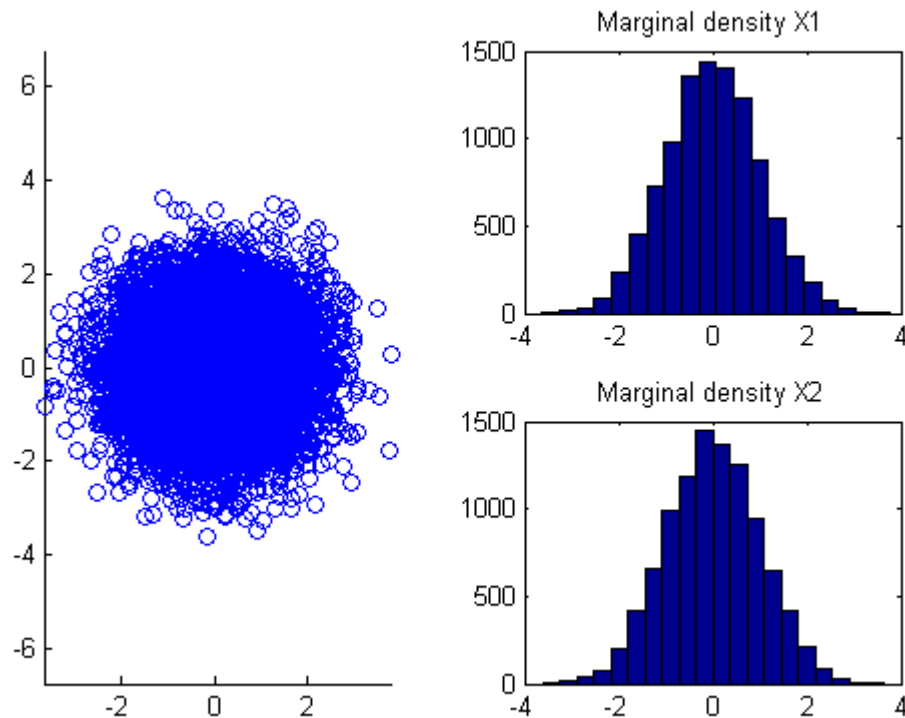
Mixed centered uniform distribution



Problem 7.1 Kurtosis Toy Data

Whitened mixed data in PC space

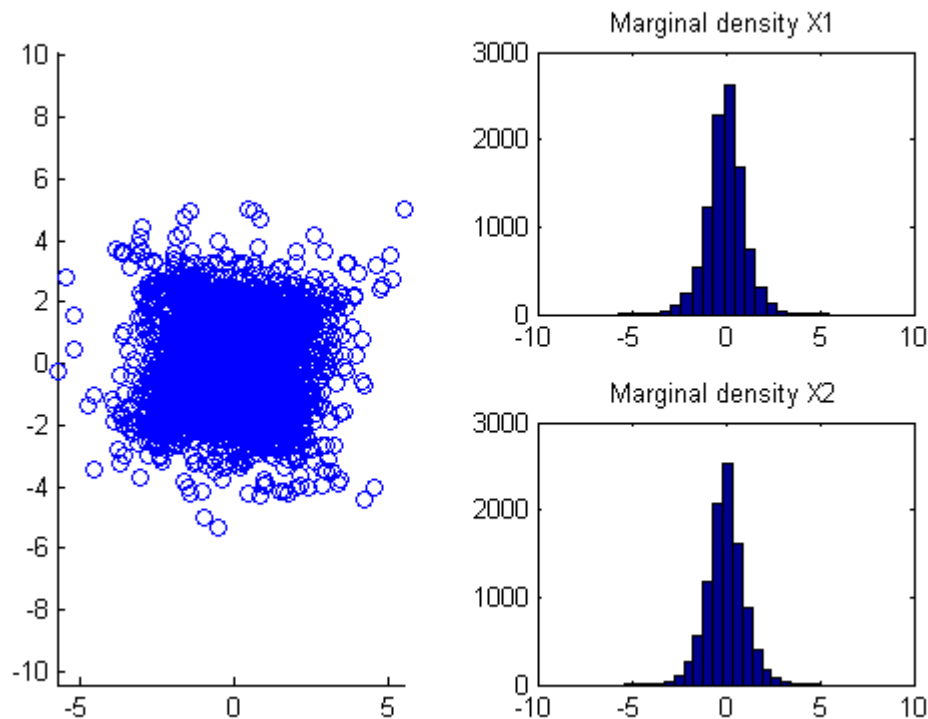
Whitened proj. mixed normal distribution



Problem 7.1 Kurtosis Toy Data

Whitened mixed data in PC space

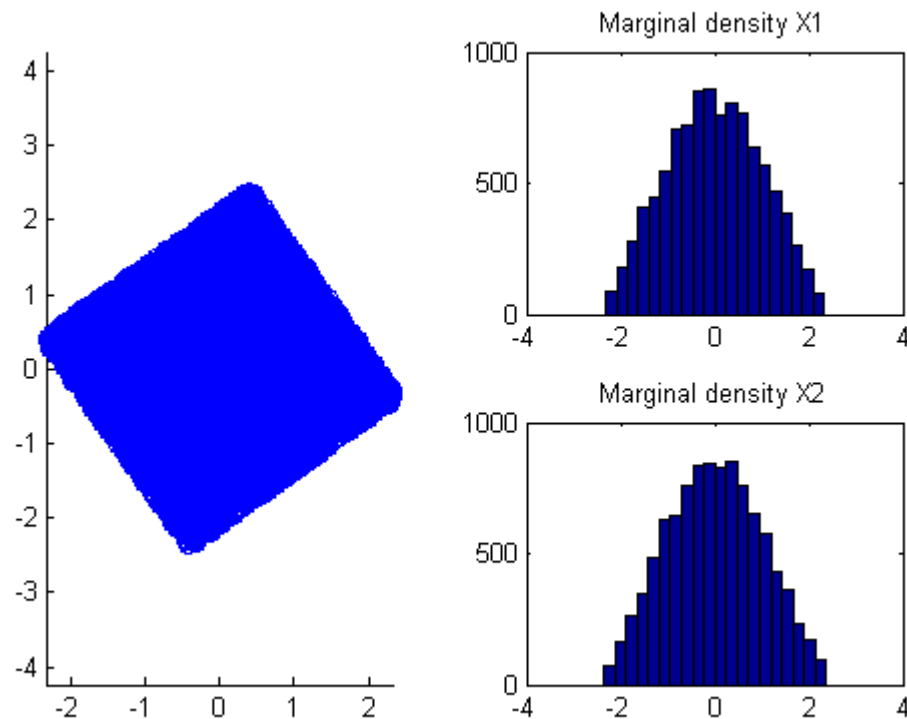
Whitened proj. mixed laplacian distribution



Problem 7.1 Kurtosis Toy Data

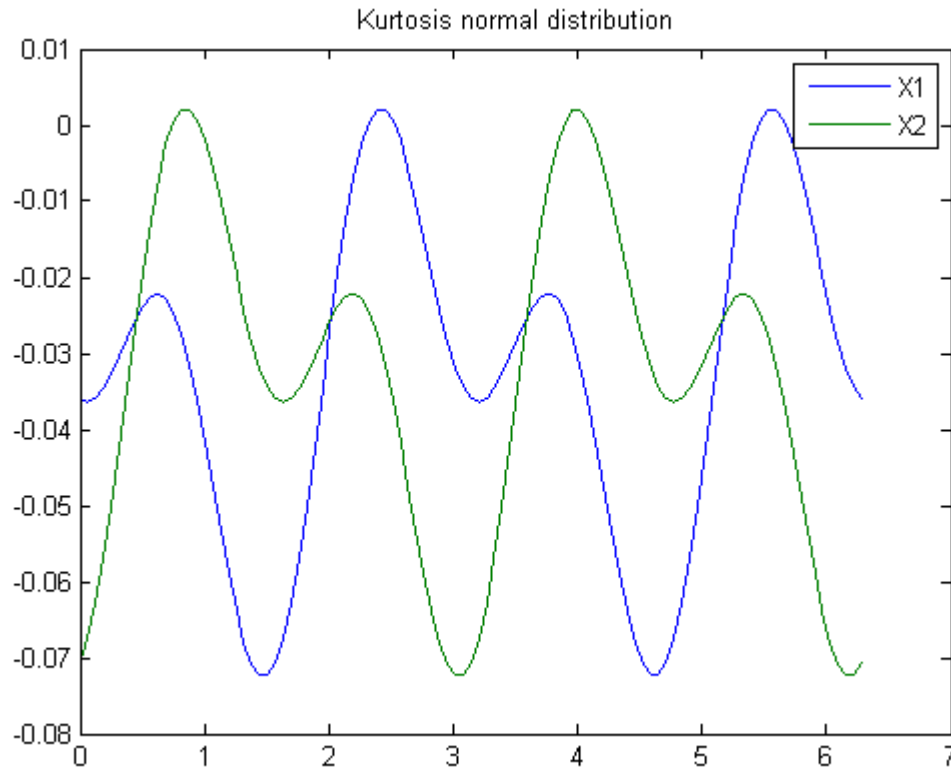
Whitened mixed data in PC space

Whitened proj. mixed uniform distribution



Problem 7.1 Kurtosis Toy Data

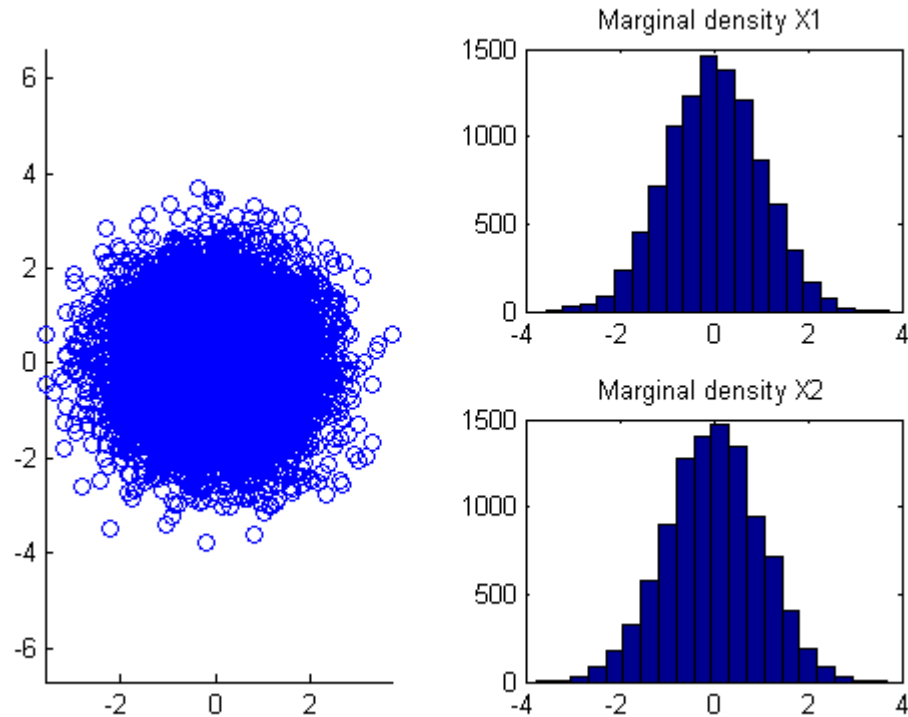
Kurtosis function - normal distribution



Problem 7.1 Kurtosis Toy Data

Kurtosis function - normal distribution

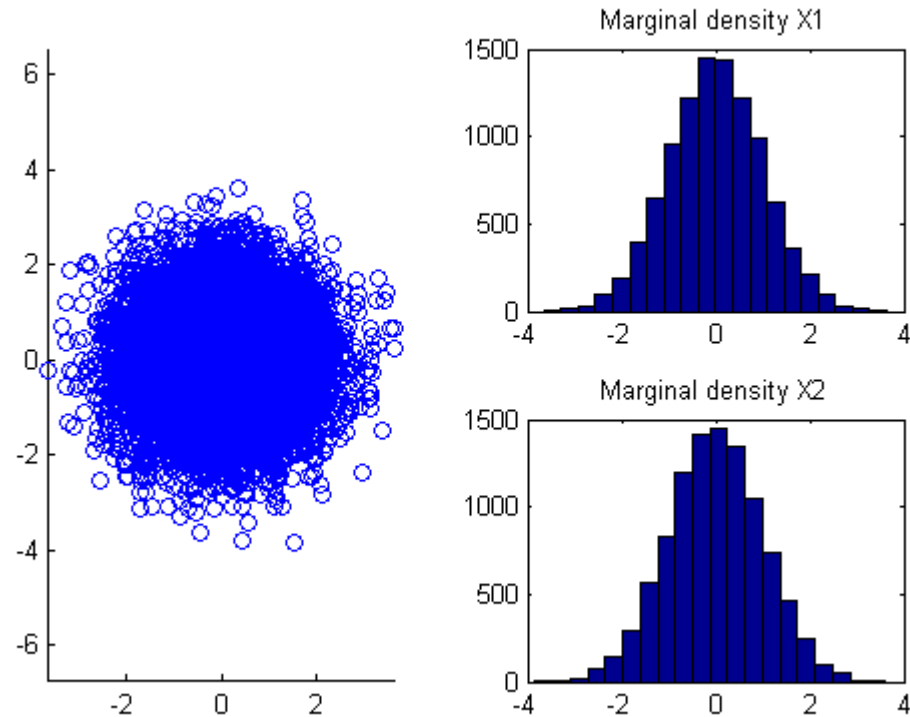
Min kurtosis normal distribution



Problem 7.1 Kurtosis Toy Data

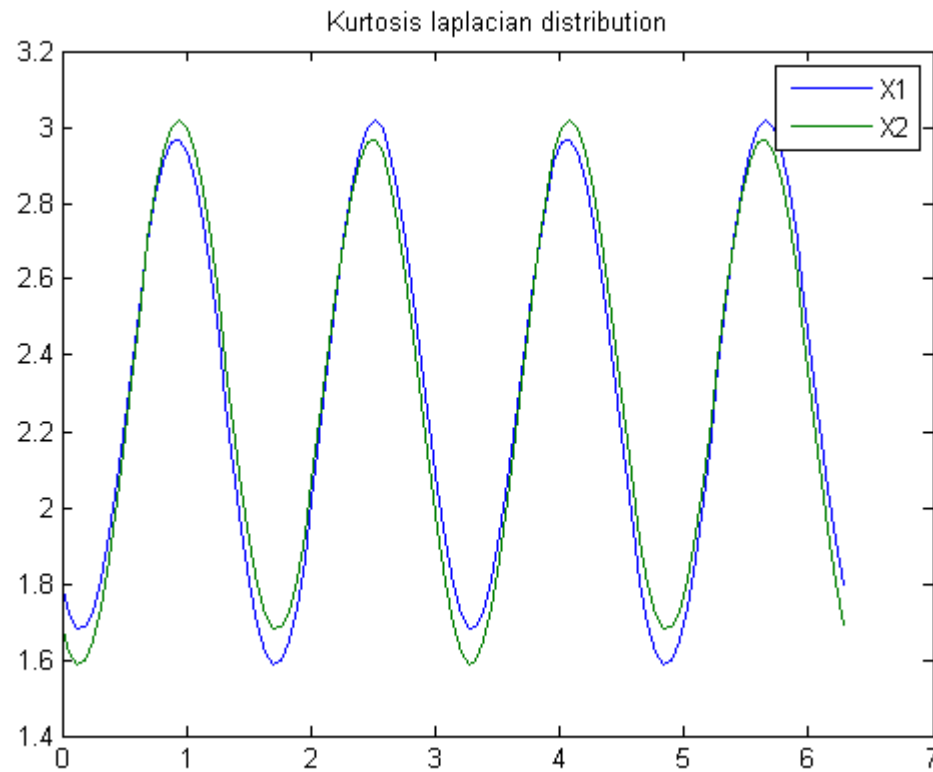
Kurtosis function - normal distribution

Max kurtosis normal distribution



Problem 7.1 Kurtosis Toy Data

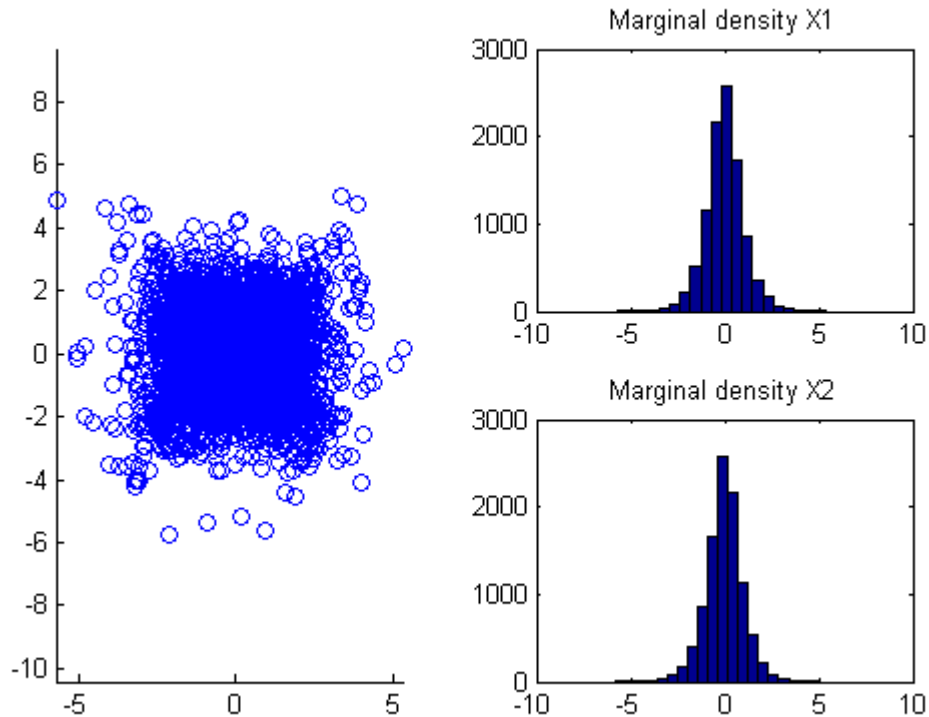
Kurtosis function - laplacian distribution



Problem 7.1 Kurtosis Toy Data

Kurtosis function - laplacian distribution

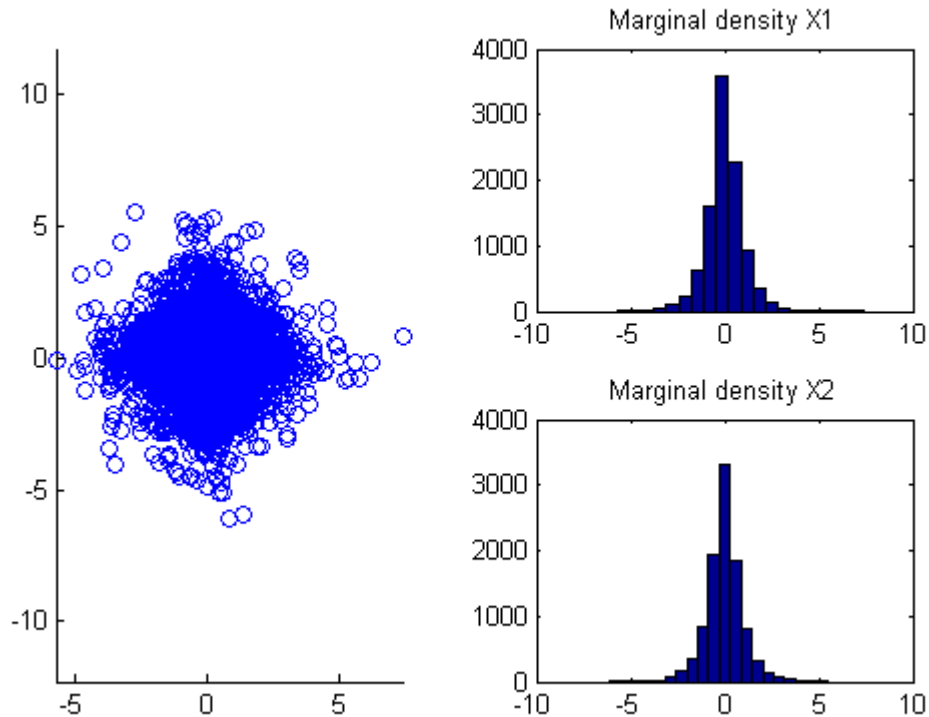
Min kurtosis laplacian distribution



Problem 7.1 Kurtosis Toy Data

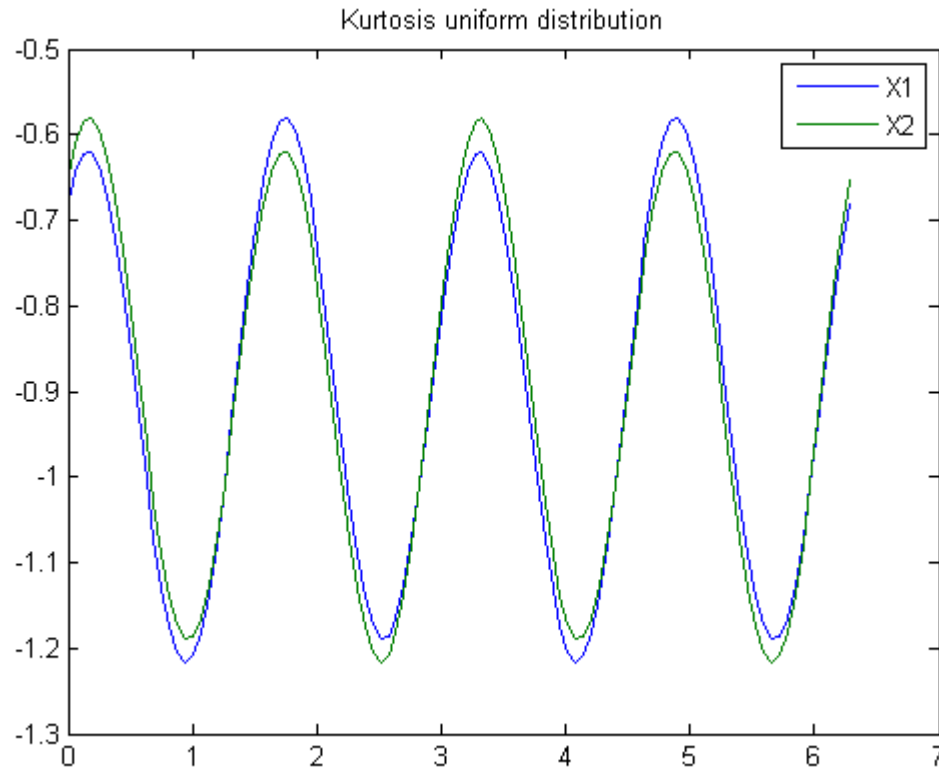
Kurtosis function - laplacian distribution

Max kurtosis laplacian distribution



Problem 7.1 Kurtosis Toy Data

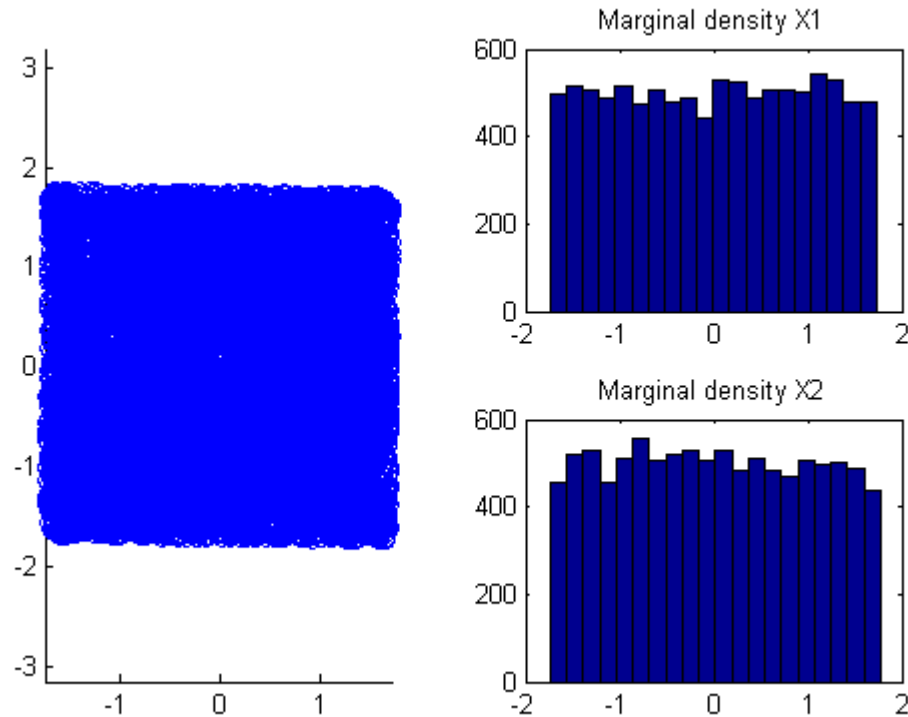
Kurtosis function - uniform distribution



Problem 7.1 Kurtosis Toy Data

Kurtosis function - uniform distribution

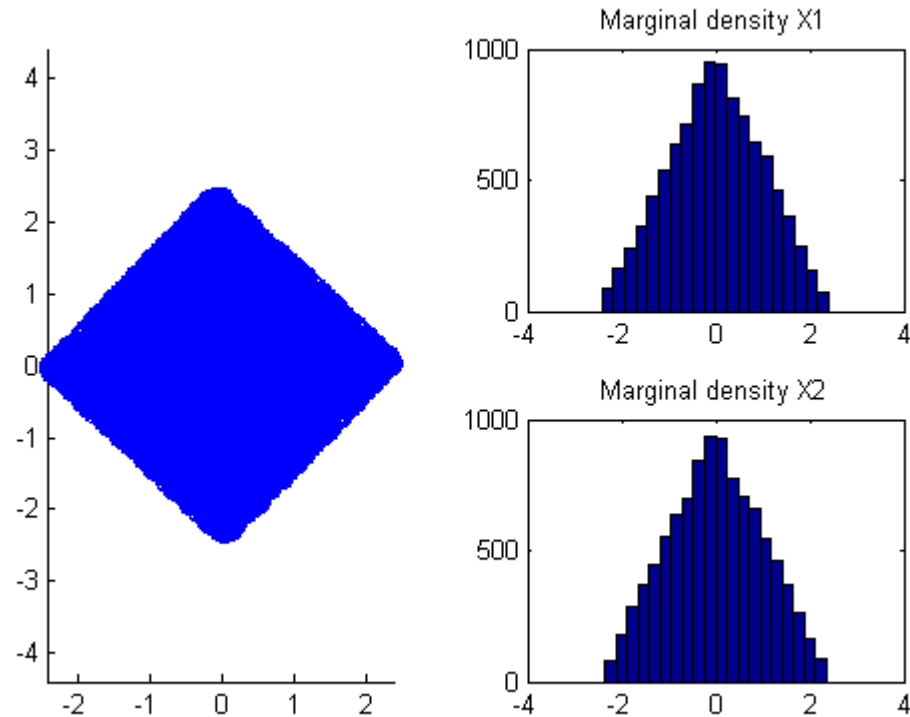
Min kurtosis uniform distribution



Problem 7.1 Kurtosis Toy Data

Kurtosis function - uniform distribution

Max kurtosis uniform distribution

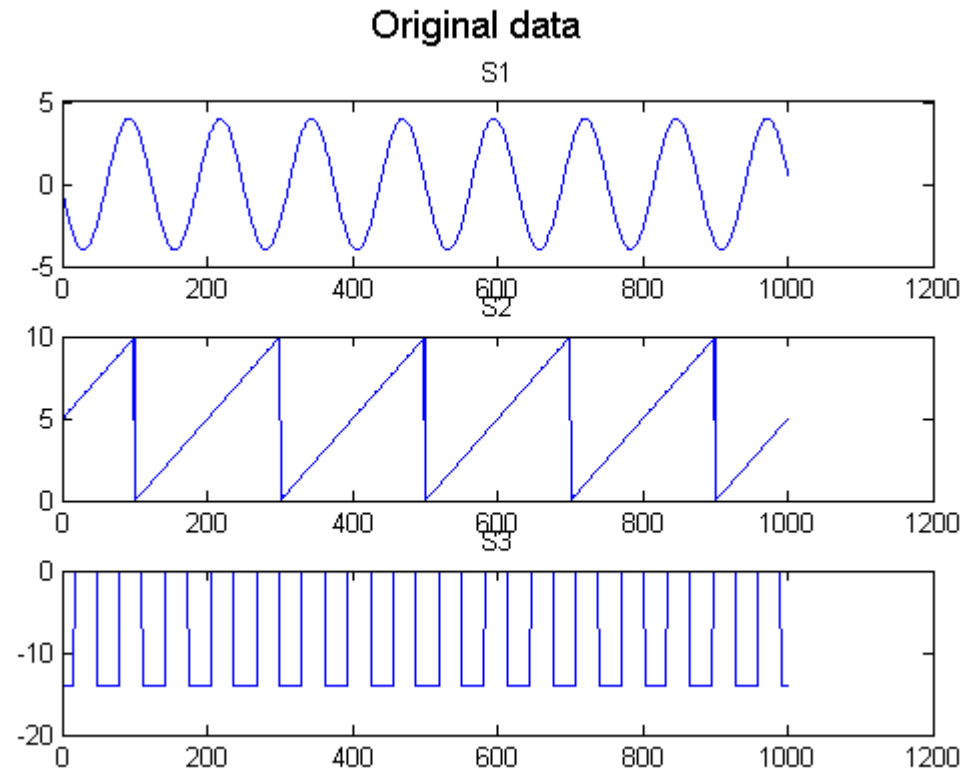


Problem 7.2

Toy Signal Separation

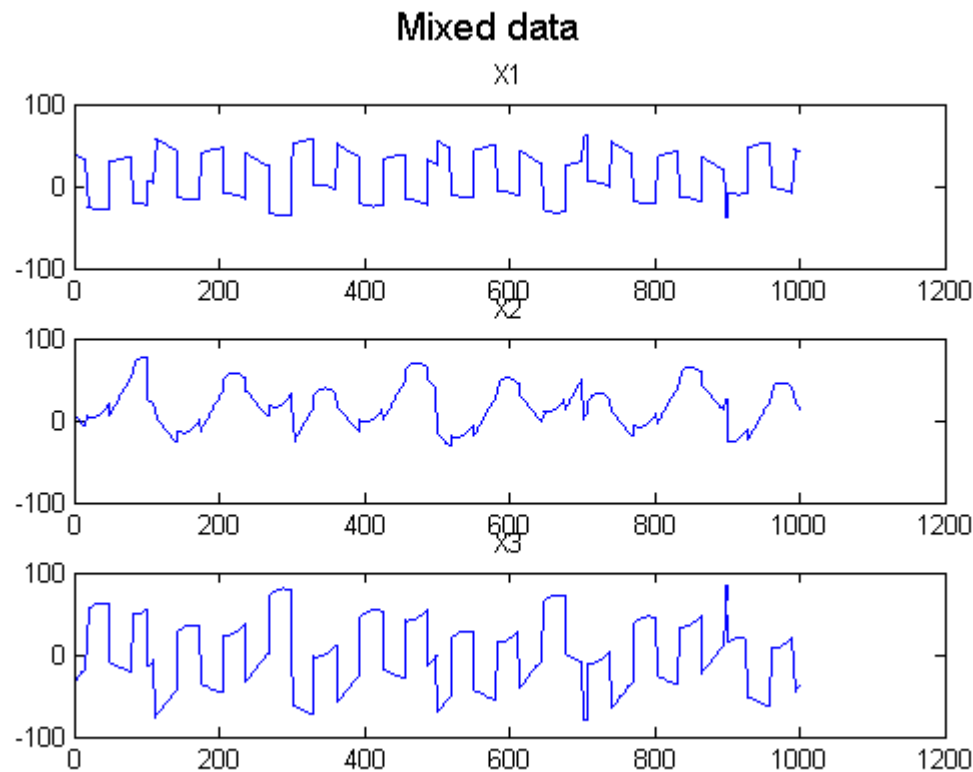
Problem 7.2 Toy Signal Separation

Generated signals



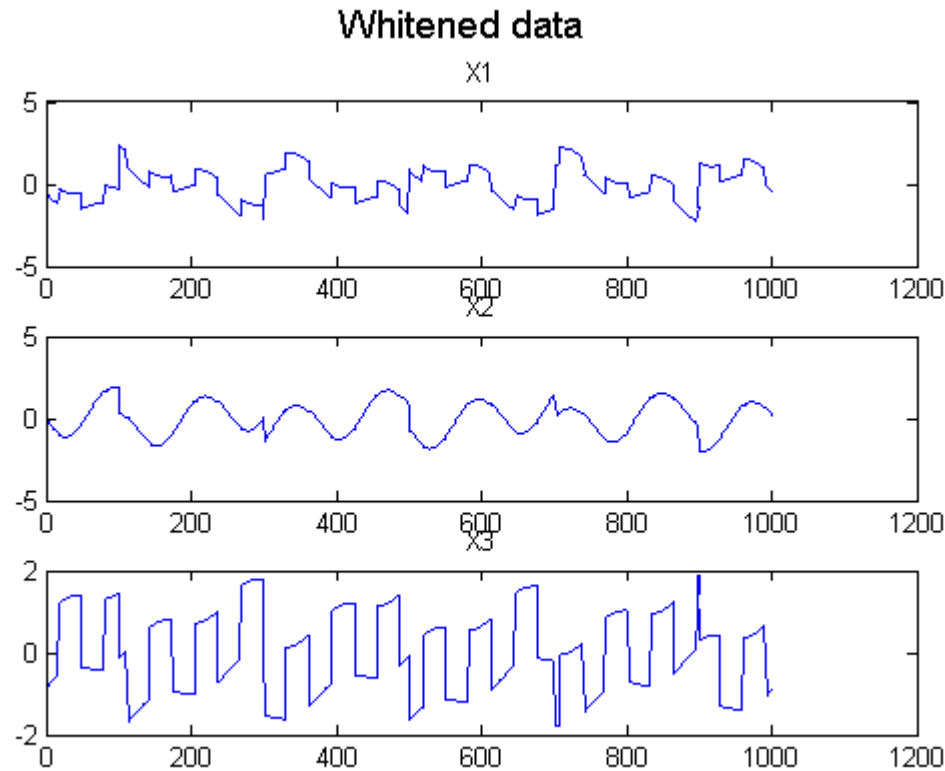
Problem 7.2 Toy Signal Separation

Mixed signals



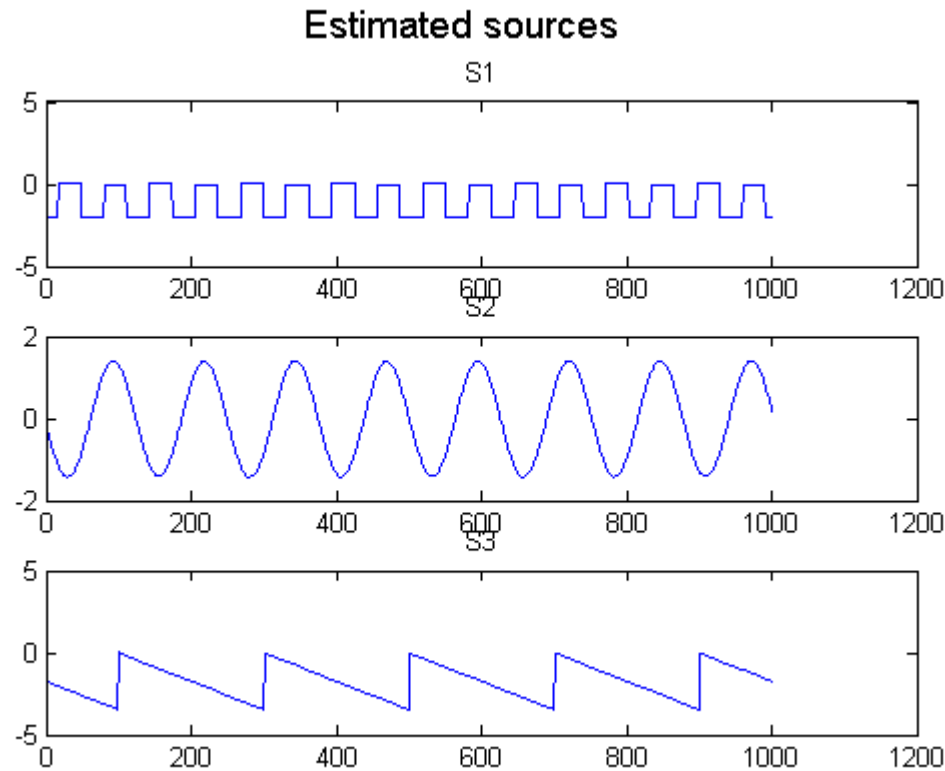
Problem 7.2 Toy Signal Separation

Whitened mixed signals



Problem 7.2 Toy Signal Separation

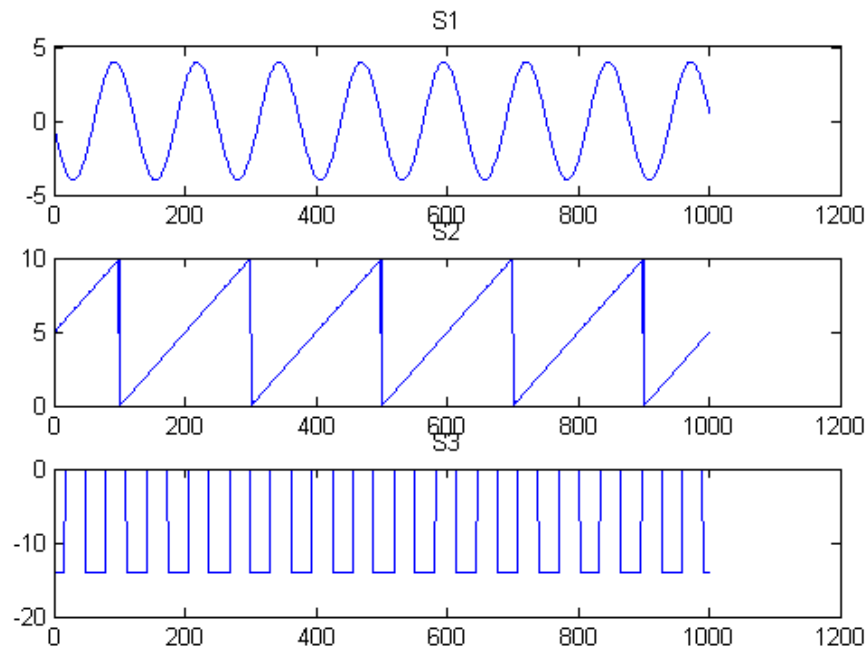
Estimated sources



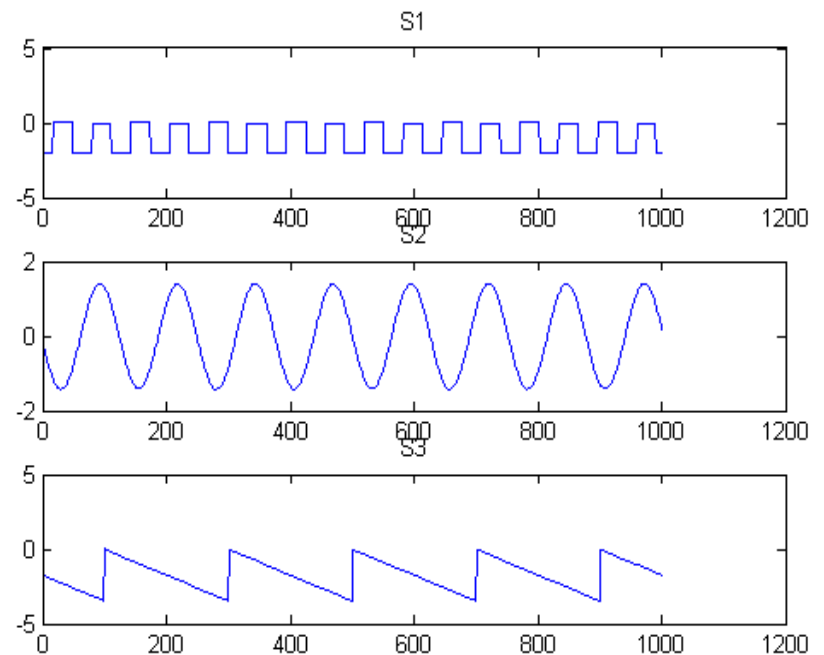
Problem 7.2 Toy Signal Separation

Comparison

Original data



Estimated sources

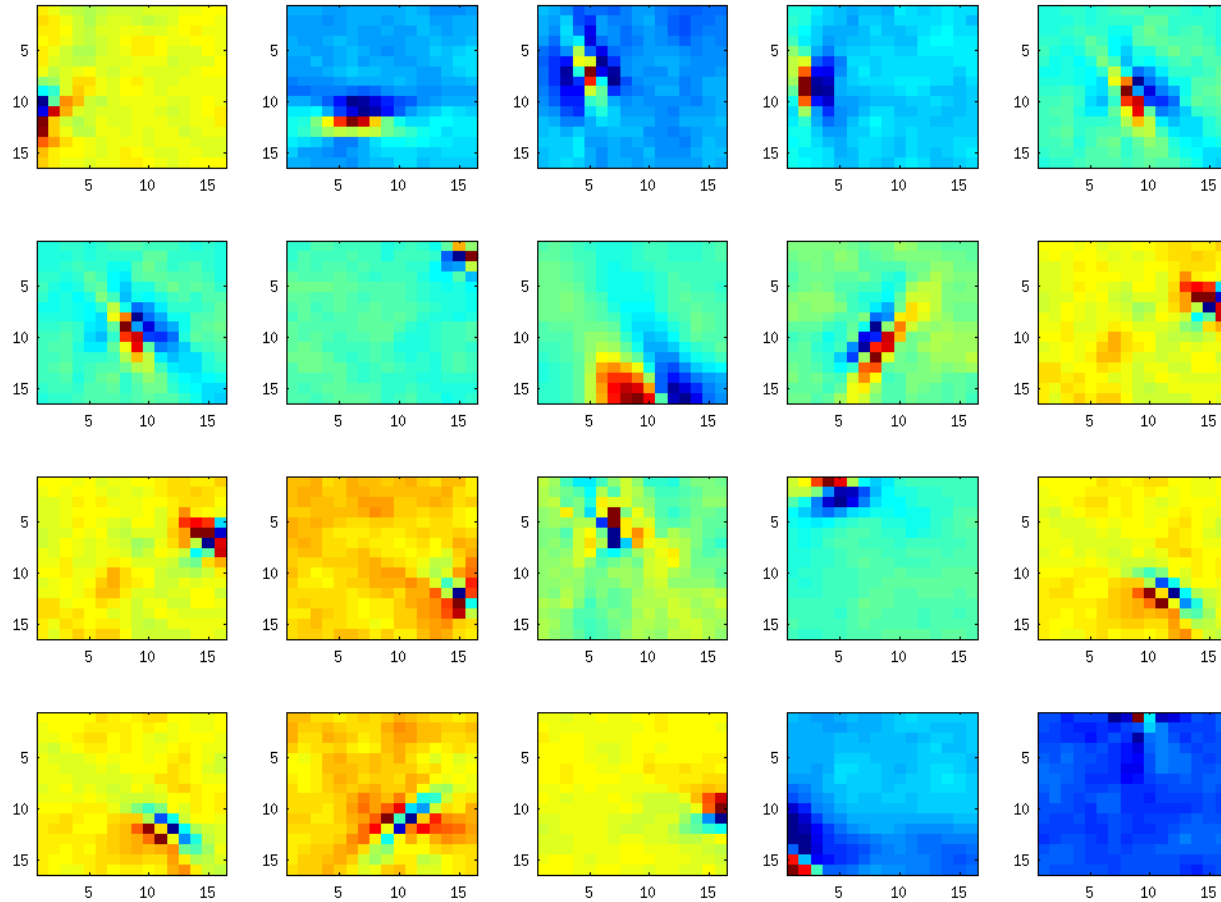


Problem 7.3

ICA on Image Patches

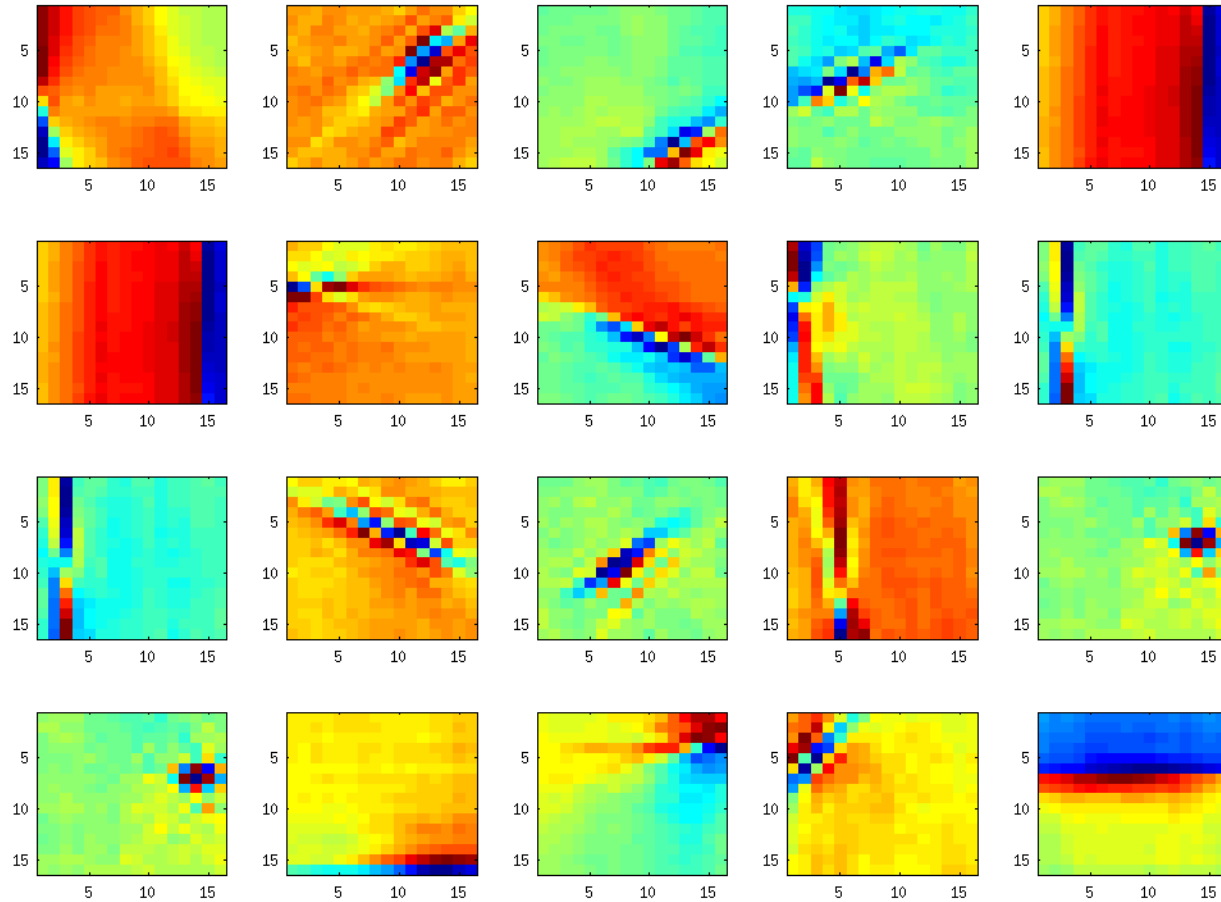
Problem 7.3 ICA on Image Patches

Independent features of nature pictures



Problem 7.3 ICA on Image Patches

Independent features of building pictures



Problem 7.3 ICA on Image Patches

Independent features of text pictures

