Lecture Note of EE: 541 A Computational Introduction to Deep Learning

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Part I

Basic theory

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what is

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what is

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Data types and control structures

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Data Structures

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Objects and classes

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Python Libraries: NumPy and Matplotlib

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Reference and Recommended Reading

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Random vectors and Covariance Matrix

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What is Estimation and what is LMMSE

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MMSE Estimation for Jointly Gaussian case

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Least Mean Square(LMS) Algorithm

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Regression and Classification

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Comparison between Regression and Classification

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Decision and Logistic Regression

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Multilayer Perceptron networks (MLPS)

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LMS versus BP

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Training Deep Neutral Networks

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Universal Approximation Theorem: Why Go Deep

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Introduction to PyTorch

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Convolutional Neutral Networks(CNNs)

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Working with Data

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Deep Learning workflow

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Normalization Methods

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Dimensionality Reduction: PCA and LDA

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Finding data

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