Lecture Data Science for Electron Microscopy Winter 2024

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Abstract

This is the website for the Data Science for Electron Microscopy Lecture

Plain Language Summary

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- Pelz Lab website
- Studon Link

1 Lecture 1: Intro (25.10.2024)

- Introduction
- d2l Chapter 2: Preliminaries

2 Lecture 2: Regression and Sensor Fusion (8.11.2024)

- d2l Chapter 3: Regression
- Sensor Fusion Slides

3 Lecture 3: CNNs (15.11.2024)

- d2l Chapter 7: CNNs
- d2l Chapter 8: CNNs

4 Lecture 4: Classification, Segmentation, AutoEncoders (22.11.2024)

- d2l Chapter 4: Classification
- d2l Chapter 14.9: Segmentation
- Segmentation
- Dimensionality Reduction
  - PCA
  - Autoencoder
  - Variational Autoencoder

5 Miniproject (29.11. - 13.12.2024)

1. Segmentation
2. VAE & Dimensionality Reduction
3. Denoising
4. Image-to-Image Translation

6 Lecture 5: Mixed Bag (10.1.2025)

- Project presentation
- Generative Adversarial Networks
- Gaussian Processes 1

7 Lecture 6: GPs (17.1.2025)

8 Lecture 7: Bayesian Optimization, Active Learning, Deep Kernel Learning (24.1.2025)

9 Lecture 8: Inverse Imaging Problems 1: Tomography, Deconvolution (31.1.2025)

10 Lecture 9: Inverse Imaging Problems 2: Phase Contrast Imaging, Superresolution Imaging (7.2.2025)