

Intelligence Systems: Introduction to AI Foundation of Data Science



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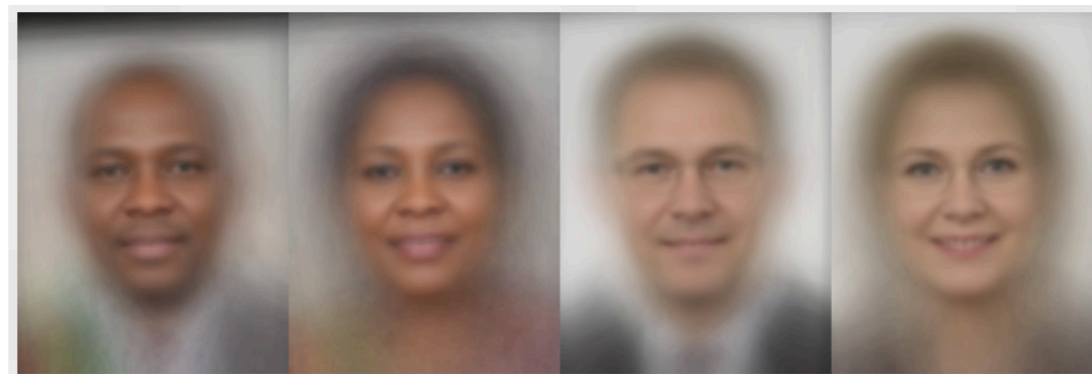
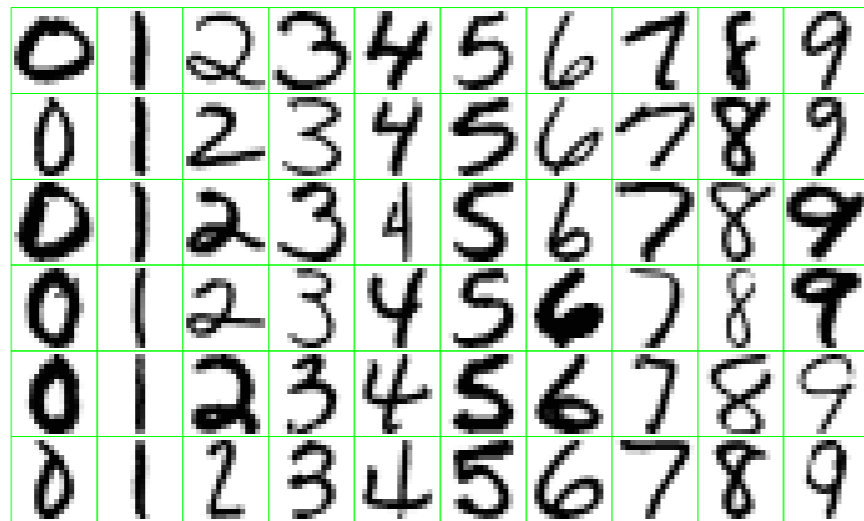




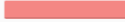


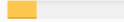



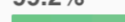
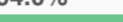







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Machine learning



Gender Classifier	Darker Male	Darker Female	Lighter Male	Lighter Female	Largest Gap
 Microsoft	94.0% 	79.2% 	100% 	98.3% 	20.8% 
 FACE++	99.3% 	65.5% 	99.2% 	94.0% 	33.8% 
 IBM	88.0% 	65.3% 	99.7% 	92.9% 	34.4% 

► Efficiently solved using data via machine learning

Intelligent Systems: Introduction to AI

- Machine Learning
 - Supervised Learning: Regression, Classification, Regularization, Cross-Validation
 - Unsupervised Learning: Recommender systems, Clustering
- Deep Learning
 - Neural Network, CNN,
 - Backpropagation, Gradient Descent
- Symbolic AI

Organization

- 11 x 1,5h courses + 11 x 1,5h lab (Scikit Learn, TensorFlow Keras)
- Grading: 1 grading lab + final exam
- Pre-requisites:
 - Basics of Python (incl. numpy), basics of algebra, basics of probability

Foundation of Data Science

- High dimension/massive data
- Data with distances (Similarity Search, Nearest Neighbor, Dimension Reduction)
- Generalization and Regularization
- Understanding Principal Components Analysis
- Sampling and Estimation
- Online Learning with Multiplicative Weights
- Advanced topics (if time permitted)
 - Interpretability and explainability
 - Fairness of machine learning algorithms

Organization

- 7 x 3h courses + 4 x 3h lab (Python)
- Grading: project (40%) + final exam (60%)
- Pre-requisites:
 - Basics of Python (incl. numpy), basics of algebra, basics of probability