Neural Nets and Deep Learning

Course Description

Neural networks and deep learning approaches have revolutionized the fields of data science and artificial intelligence in recent years, and applications built on these techniques have reached or surpassed human performance in many specialized applications.After a short review of the origins of neural networks and deep learning, this course discusses in detail how feed-forward networks are set up and trained. Special focus is given on how to avoid overtraining in neural networks.In addition to feed-forward neural networks, this course covers additional common network architectures such as convolutional and recurrent neural networks. Moreover, by means of the accompanying video material and online tutorial support the impact of design choices and the data collection process on questions of algorithmic fairness both in terms of its individual as well as its societal dimension will be discussed.

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   4. Supervised learning
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   3. Backpropagation and gradient descent
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   2. Early stopping
   3. L1 and L2 regularization
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   3. CNN architecture
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5.1 Recurrent neurons

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