

Intro to Deep Learning

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Course material

<https://github.com/dalcimar/RC18EE---Intro-to-Deep-Learning>

Esse curso é lecionado no Programa de Pós Graduação em Engenharia Elétrica (PPGEE) e como optativa do curso de Engenharia da Computação e Engenharia Elétrica, ambos da UTFPR, campus Pato Branco.

Caso tenha interesse em realizar mestrado nessa área entre em contato comigo, ou diretamente na secretaria do PPGEE. Links abaixo

<http://www.utfpr.edu.br/cursos/coordenacoes/stricto-sensu/ppgee-pb/ppgee-pb>

Intro to Deep Learning

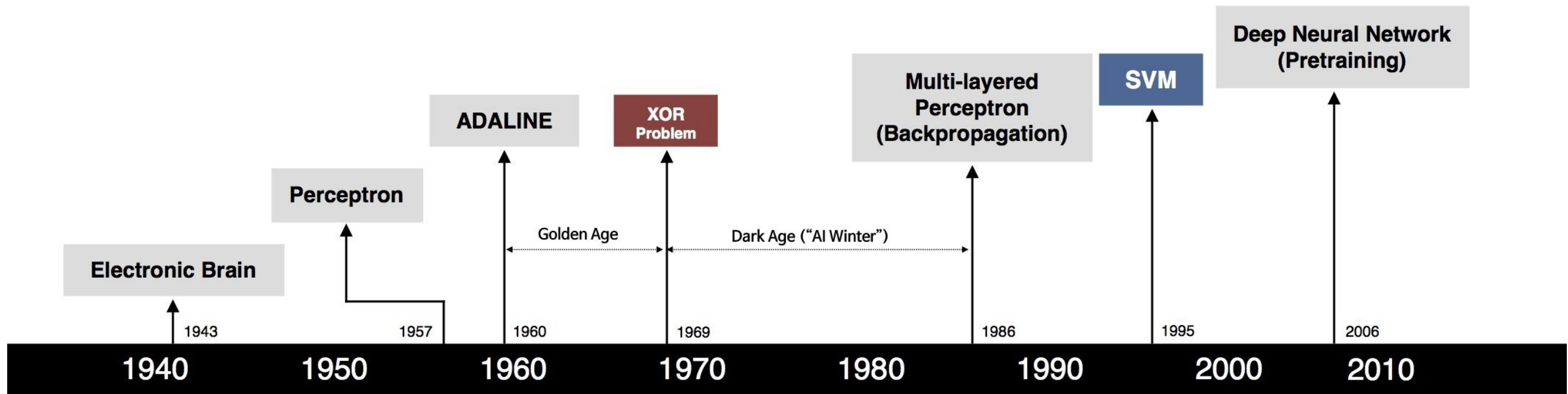
Sebastian Rascka

<https://sebastianraschka.com/>

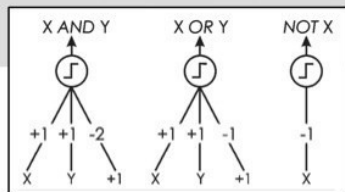
Topics Summary

- Part 1: Introduction
 - Introduction to deep learning
 - The brief history of deep learning
 - Single-layer neural networks: The perceptron algorithm
- Part 2: Mathematical and computational foundations
 - Linear algebra and calculus for deep learning
 - Parameter optimization with gradient descent
 - Automatic differentiation
 - Cluster and cloud computing resources
- Part 3: Introduction to neural networks
 - Multinomial logistic regression
 - Multilayer perceptrons
 - Regularization
 - Input normalization and weight initialization
 - Learning rates and advanced optimization algorithms
- Part 4: Deep learning for computer vision and language modeling
 - Convolutional neural networks (CNN)
 - Recurrent neural networks (RNN)
- Part 5: Deep generative models
 - Autoencoders
 - Autoregressive models
 - Variational autoencoders
 - Normalizing Flow Models
 - Generative model (GAN)
 - Evaluating generative models

Topics Summary



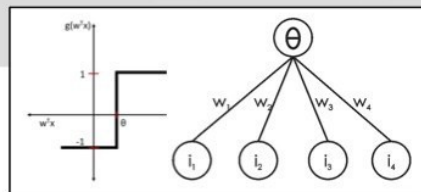
S. McCulloch – W. Pitts



- Adjustable Weights
- Weights are not Learned



F. Rosenblatt



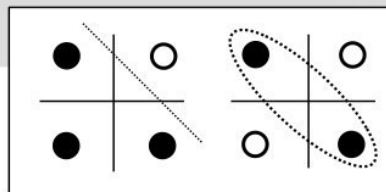
- Learnable Weights and Threshold



B. Widrow – M. Hoff



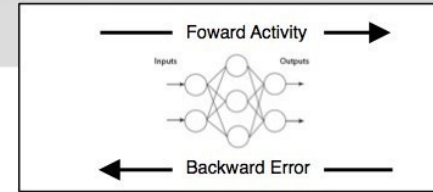
M. Minsky – S. Papert



- XOR Problem



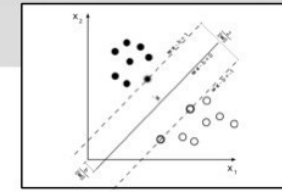
D. Rumelhart – G. Hinton – R. Williams



- Solution to nonlinearly separable problems
- Big computation, local optima and overfitting



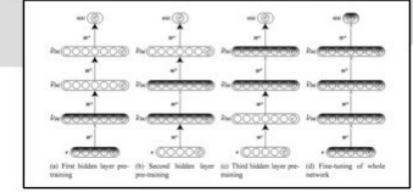
V. Vapnik – C. Cortes



- Limitations of learning prior knowledge
- Kernel function: Human Intervention



G. Hinton – S. Ruslan



- Hierarchical feature Learning