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ALL PROJECTS

ML/AI PROJECTS WITH PAPERS (GITHUB DIRECTORY ↗)

Quantized Neural Networks PDF ↗ | Tensorflow, Keras, TF-QAT **05-2022**

- Implementation & analysis of quantized neural-networks. **Quantization of AlexNet, VGG16, ResNet50**.
- ***Project Advisor:*** Professor Adnan Darwiche

Language Models, Embeddings, and HMMs PDF w/code ↗ | Python, NLTK, SkLearn, Gensim **05-2022**

- Impl. of language models, embeddings (sparse, dense, word2vec), and HMMs in context of Bayesian Networks.

Fundamental Reinforcement Learning Algorithms PDF w/code ↗ | Python, OpenAI Gym **05-2021**

- Impl. of key RL algorithms: Q-Learning, Sarsa, Sarsa-λ, UCB Exploration, Gradient Bandits, MC-Control Methods.

ML/AI CODE-ONLY PROJECTS (GITHUB DIRECTORY ↗)

Bayesian Networks Inference Github ↗ | Java **03-2022**

- Implementation of Bayesian Network operations such as Factor Multiplication, Marginalization, etc.
- Implementation of Bayesian Network algorithms such as Variable Elimination (VE), Factor Elimination (FE), Join-Trees, Elimination-Trees, Interaction-Graphs
- To-do: Most Probable Explanation (MPE) (e.g., Viterbi with a specific VE and when BN is HMM); Maximum a-posteriori Hypothesis; Belief-Propagation (Exact and Approximate); Bayesian-Network Model Learning

Data Mining Algoritms for Frequent and Sequential Pattern Mining Github ↗ | Java **04-2022**

- Frequent Itemset Pattern Mining: Implementation of Apriori algorithm, Candidate-Generation for Itemsets, CLOSET (Mining of frequent closed patterns), DIC (Dynamic Item Counting), FP-Growth, Max-Miner
- Frequent Sequential Pattern Mining: Implementation of GSP, Candidate-Generation for Sequential patterns, PrefixSpan
- To-do: Advanced Clustering Algorithms: Medoids based: PAM; Medoids-Sampling based: CLARA, CLARANS; Hierarchical Clustering: BIRCH; Density-based clustering: DBSCAN, STING, OPTICS
- To-do: Association-Rule Based Classifiers: CAR & M1 (done in Python in another repo)
- To-do: Frequent Tree Mining: TreeMiner
- To-do: Frequent Graph Mining: FSG, gSpan, FFSM