Summary

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SPOT Survey

- Deadline: July 1st
- Your feedback matters!

A review of learned models

- Decision Tree
- Naïve Bayes
- Logistic Regression
- Regression
- Perceptron
- Support Vector Machine
- Bayesian Networks
- Gaussian Mixture Clustering
- K-Means Clustering
- Neural Networks, DNN, CNN, RNN, Autoencoder
- Generative Adversarial Networks

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A review of learned algorithms

- Ensemble Learning
- Kernelization
- Graphical Models, Markov Decision Model
- Expectation Maximazation
- Gradient Ascent/Descent
- Back propagation
- Stochastic Optimization
- Optimization Strategies

A review of learned concepts

- Function Approximation

- Entropy

- Overfitting and Underfitting, Regularization

- Maximum Likelihood Estimation and Maximum A Posteriori Estimation

- Generative and Discriminative Classifiers

- Variance and Bias Tradeoff

- Supervised and Unsupervised Learning

- Classification and Regression

- Training, Validation and Testing Data

- Cross-validation, K-folds and Leave-one-out Validation

- Dimension Reduction

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Equivalently important concepts that are uncovered

- Parametric vs non-parametric models
  - Parametric models has a fixed amount of parameters
- The curse of dimensionality
- Speed-Accuracy-Complexity Tradeoff
- KL Divergence
- Radial Based Function (RBF) Kernel

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Equivalently important models that are uncovered

- K-nearest neighbors (KNN)
- Term Frequency - Inverted Document Frequency (TF-IDF)
- Linear Discriminant Analysis (LDA)
- Principle Component Analysis (PCA)
- Singular Value Decomposition (SVD)
- Multidimensional Scaling (MDS)

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More advanced topics

- Gaussian Process (GP)
- Hidden Markov Models
- State Space Models, Kalman filtering and smoothing
- Belief Propagation
- Variational Inference
- Markov Chain Monte Carlo inference
- Wavelet Transform
- Matrix Factorization

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More advanced topics on Deep Learning

- Transfer Learning

- Multi-task Learning

- Online Learning

- One-shot Learning

- Federated Learning

- Deep Belief Networks

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Research

- KDD
- CIKM
- AAAI
- NeurIPS
- IJCAI
- And many more…

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Open-ended discussions

- Always prefer ML models?

  - Pro & Con?

- Real life applications?

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Some ML Questions

- Link to document

Thank you for participating :)

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