Reinforcement Learning
Supervised Learning
Unsupervised Learning
Feature Selection
Prediction
Clustering
Classification
Feature Extraction
Decision Trees
K-means
Naive Bayes Classifier
Nearest Neighborhood Method
Kernel Trick
Ensemble Models
Meta-parameter Optimization
Support Vector Machines
Random Forests
Representation Learning
Neural Network
Random Fields
Deep Learning
Topological Data Analysis
Dimensionality Reduction
Energy Based Models
Cross Validation
Manifold Learning
Neural Encoding
Dictionary Learning
Over-fitting And Generalization
Sparse Encoding
Function Approximation
Similarity Measures
PC
Gradient Descent
Self Organizing Maps
Curse Of Dimensionality
Space Transformation
Precision/recall
Fourier Transformation
Model Complexity
Matrix Operations
Markov Chains
Meta-heuristics
Vector Spaces
Regression Models
Accuracy Measures
Linear Systems
Hill Climbing Methods
System Of Equations
Nonparametric Probability Distributions
Objective Minimization
Random Walk
Data Reduction
Invariance Features
Least Square Method
Resampling
Probabilistic Distributions
Data Visualization
Maximum Likelihood
Law Of Large Numbers
Causality/correlations
Data Normalization
Hypothesis Testing
Mathematical Programing
Central Limit Theorem
Descriptive Statistics
Bayes' Rule
Histograms
Random Variables
Outliers

TECHNICAL PHD SEMINAR SERIES:

DATA DRIVEN MODELING

Mathematical and coding concepts with a focus on Self Organizing Maps

Ubiquitous data streams, being emitted from different aspects of our daily life has opened up new concepts of scientific modeling such as data driven modeling that challenge the classical notions of domain expertise, rule based systems and theory based models of real world phenomena. While we see data streams and Big Data as a new resource for modeling and design, we think its applications become prominent if we look at data via a new set of mathematical and coding skills, which goes beyond geometric thinking.

Toward this goal, in this series of technical seminars we introduce and discuss some of these mathematical concepts (as shown above) in four interlinked categories of Probability Theory and Statistics, Optimization Theories, Linear Algebra and Machine Learning Theories. All the concepts and techniques will be presented using Python programming language and sample data sets, while the objective is to attract architectural researchers to challenge these wild technologies from the perspective of design.

dates: Tuesdays 13:30 - 15:30
introduction: Tuesday, September 20, 2016
place: Chair for CAAD, D-ARCH / ITA / CAAD HIB E 16, unless announced differently
course tutor: Vahid Moosavi

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