Statistics

Measurements

- [x] Algebra of Random Variables

Centrality

- [x] Average
- [x] Harmonic Average
- [ ] Geometric Average
- [x] Quadratic Average
- [ ] Generalized Average
- [x] Weighted Average
- [x] Median
- [x] Mode
- [ ] Maximum-minimum Range

Dispersion

- [x] Variance and Standard Deviation
- [x] Average Deviation and Median Deviation
- [x] Average Minkowski Distance
- [x] Average Manhattan Distance

Other

- [x] Skewness
- [x] Kurtosis

Relationship

- [x] Covariance
- [x] Correlation
- [x] Auto-correlation
- [x] Correlation Matrix
- [x] Partial-correlation

Data Exploration

Graphical Representation

- [x] Scatter Plot
- [x] Box-Plot
- [x] Run Sequence (Time Series)
- [x] Histogram
- [x] Bootstrap plot (Resample Plot)
- [x] Log-log plot
- [x] Semi-log plot
- [x] Lag plot
- [x] Spectral Plot
- [x] Mean Plot

Hypothesis Test

- [x] Student’s test (t-test)
- [x] F-test
- [x] Analysis of Variance (NOVA)
- [x] Multivariate Analysis of Variance (MANOVA)
- [x] Anderson–Darling test
- [x] Bartlett test
- [ ] Ljung-Box test
  - [ ]

Validation

- [x] p-value
- [x] Confidence Interval

Statistical Distribution Distance

- [x] Chi-square test (x^2 test)
- [x] Chi-square test for variance
- [x] Kolmogorov–Smirnov test (KS-test)
- [x] Kuiper's test
- [x] Quantile plot (Q-Q-plot)
- [x] Linear Regression

Data Transformation

- [ ] Independent Component Analysis (ICA)
- [x] Principal Component Analysis (PCA)
- [ ] Singular Value Decomposition (SVD)
- [x] Standardization
- [x] Normalization
- [x] Discretization
- [ ] t-SNE
- [x] Renormalization Theory
- [x] Box-Cox transformation

Noise Reduction

- [x] Blocking
- [x] Bootstrap
- [x] Jackknife

Outliers Detection

- [x] Naive
- [x] Grubb's test
- [x] Binder Parameter (Binder Cumulant)
- [ ] Tietjen-Moore Test

Information Theory

- [x] Sampling
  - [x] Signal-to-noise ratio
  - [x] Nyquist-Shannon theorem
  - [x] Blocking
  - [x] Bootstrap
  - [x] Jackknife
- [x] Equilibrium Statistics
  - [x] Ergodicity
  - [x] Detailed Balance
  - [x] Global Balance
  - [x] Le Chatelier's principle
- [x] Entropy
  - [x] Bolztman entropy
  - [x] Shannon/Gibbs entropy
  - [x] Renyi entropy
  - [x] Tsallis entropy
  - [x] Mutual Information
  - [x] Convolution
- [ ] Akaike information criterion
- [ ] f-divergence
- [x] Kullback–Leibler divergence
- [ ] Hellinger distance

Statistical Learning

Classification

Supervised

- [x] K-Nearest Neighbors (K-NN)
- [x] Least Angle Regression
- [x] Logistic Regression
- [x] Decision trees
- [ ] Ridge regression
- [ ] Least Absolute Shrinkage and Selection Operator (Lasso)
- [x] Perceptron
- [ ] Multi-layer Perceptron
- [x] Bayesian
    - [x] 1. Naive
    - [x] 2. Bernoulli
    - [x] 3. Gaussian
- [x] Support Vector Machine (SVM)
    - [x] 1. Polynomial (Homo)
    - [x] 2. Polynomial (inHomo)
    - [x] 3. Radial
    - [ ] 4. Hyperbolic Tangent
- [ ] Ensemble Methods (Averaging)
    - [ ] 1. Bagging Methods
    - [ ] 2. Random Forests

Unsupervised

- [x] K-means clustering [x]
- [ ] Spectral clustering
- [ ] Affinity Propagation
- [ ] Mean Shift

- [ ] Hierarchical clustering
- [ ] Artificial Neural Net (ANN)
  - [ ] Bolztmann Machine
  - [ ] Hopfield network
  - [ ] Self-Organized Map (Kohonen Map)
  - [ ] Neural Gas
  - [ ] Spiking neural network
  - [ ] Auto encoder
- [ ] Ensemble method (Boosting)
  - [ ] AdaBoost
  - [ ] Gradient Tree Boost

Regression

- [x] Linear regression
- [ ] Least Angle Regression
- [x] Logistic Regression
- [x] Decision trees
- [ ] Ridge regression
- [ ] Bayesian Models
  - [x] Uniform Naive Bayes
  - [ ] Bernoulli Naive Bayes
  - [x] Gaussian Naive Bayes
- [ ] Polynomial
  - [x] Lagrange
  - [x] Newton
  - [ ] Chebyshev
- [x] Maximum Likelihood Estimation
  - [ ] Binomial
  - [x] Exponential
  - [x] Gaussian
  - [ ] Logit

Validation

- [ ] Metrics and Scoring
- [x] Cross-Validation
- [x] Blocking
- [x] Bootstrap
- [x] Jackknife

Time Series Analysis

Description

- [ ] Moving Average (MA)
- [ ] Simple Moving Average (SMA)
- [ ] Exponential Moving Average (EMA)
- [ ] Auto Regressive Moving Average (ARMA)
- [ ] Auto Regressive Integrate Moving Average (ARIMA)

Model Determination

- [x] Box-J enkins

Forcasting

- [x] Importance Sampling
- [x] Holt-Winter Model
- [ ] Kalma Filter

(Mild) If anti-air was weak in SD44, to compensate, in SD2 two good anti-air in the back can negate the entire enemy air force.