

Data analysis

Visual analysis: QQ-Plot, Cobweb

Fitting tests: Kolmogorov, Chi2

Multivariate distribution: kernel smoothing (KDE), maximum likelihood

Process: covariance models, Welch and Whittle estimators

Bayesian calibration: Metropolis-Hastings, conditional distribution

Reliability, sensitivity

Sampling methods: Monte Carlo, LHS, low discrepancy sequences

Variance reduction methods: importance sampling, subset sampling

Approximation methods: FORM, SORM

Indices: Spearman, Sobol, ANCOVA

Importance factors: perturbation method, FORM, Monte Carlo

Probabilistic modeling

Dependence modelling: elliptical, archimedian copulas.

Univariate distribution: Normal, Weibull

Multivariate distribution: Student, Dirichlet, Multinomial, User-defined

Process: Gaussian, ARMA, Random walk.

Covariance models: Matern, Exponential, User-defined

Functional modeling

Numerical functions: symbolic, Python-defined, user-defined

Function operators: addition, product, composition, gradients

Function transformation: linear combination, aggregation, parametrization

Polynomials: orthogonal polynomial, algebra

Meta modeling

Functional basis methods: orthogonal basis (polynomials, Fourier, Haar, Soize Ghanem)

Gaussian process regression: General linear model (GLM), Kriging

Spectral methods: functional chaos (PCE), Karhunen-Loeve, low-rank tensors

Numerical methods

Integration: Gauss-Kronrod

Optimization: NLOpt, Cobyla, TNC

Root finding: Brent, Bisection

Linear algebra: Matrix, HMat

Interpolation: piecewise linear, piecewise Hermite

Least squares: SVD, QR, Cholesky