

### Time Series MT 2.1

Time Series MT 2.1 includes easy to use and clearly documented tools for the analysis and modelling of linear and non-linear panel and time series data. Supported time-series models include: ARIMA and ARMA, VARMAX, seasonal VARMAX, error correction models, Least Squares Dummy Variable regression, fixed and random effects regressions, univariate and integrated GARCH, GJR GARCH, GARCH-inmean, Hamilton regime-switching models, multiple structural break, threshold autoregressive models, and rolling and recursive OLS estimation. In addition, a number of tools facilitate extensive data analysis and goodness of fit evaluations including: ACF and PACF computations, graphs, and reports, Bartlet, Parzen, or Quadratic kernels for long-run variance estimations, lag selection procedure including AIC, SBC, HQC, and FPE, data aggregation, scaling, detrending, and demeaning, parameter instability detection including, single series and panel data unit root and testing.

### Bayesian Estimation Tools 1.0

The Bayesian Estimation Tool includes pre-programmed tools for Bayesian modelling. Easy-to-use pre-programmed models, combined with well documented examples, allow for quick implementation for personal modelling needs. Pre-programmed Bayesian models include: univariate and multivariate linear models, univariate linear model with autoregressive error terms, hierarchical Bayesian model, two-factor dynamic factor models and Structural Vector Autoregressive (SVAR) model.

### FANPAC MT 3.0 - Financial Analysis Package

FANPAC is a GAUSS package for the analysis of time-series data. It supports univariate and multivariate models commonly used in finance, include: ARIMA, VAR, VARMA, GARCH, EGARCH, FIGARCH, ARMA-GARCH, ARMA-FIGARCH, Diagonal Vech ARMA/GARMA,

Diagonal Vech ARMA-FIGARCH, and BEKK. For all models, there are in-mean versions, in-CV versions (i.e., independent variables in the conditional variance equations), Normal and t-distributions, QML inference, and Box-Cox transformations.

### Maximum Likelihood MT 2.0

Maximum Likelihood MT 2.0 provides users with complete and efficient MLE tools for use with personal likelihood functions or one of the numerous likelihood functions provided in the module. Choose among several optimization methods, including BFGS, Newton-Raphson, BHHH, and others. Several methods for statistical inference are provided, including QML, profile likelihood, bootstrap, and Bayesian. The new maximum likelihood module contains several new procedures that are up to 800% faster than their predecessors.

### Discrete Choice 1.0

Discrete Choice is a package for the fitting of a variety of models with categorical dependent variables, including the nested logit and several types of multinomial logit models, and Poisson and Probit models with truncation, censoring, and zero-inflation. Output includes full information maximum likelihood estimates with either standard or quasi-maximum likelihood inference. Marginal effects are computed with respect to means of exogenous variables or as average partials with respect to exogenous variables.

**> Requires:**  
GAUSS 13.1+

**Platforms:**  
Windows, Mac and Linux

## Constrained Maximum Likelihood MT 2.0

Constrained Maximum Likelihood MT (CMLmt) performs maximum likelihood estimation with general equality and inequality constraints and bounds on the parameters. Procedures are included for computing correct standard errors for inequality constrained parameters. CMLmt includes bootstrapping and Bayesian inference with kernel density plots, histograms and surface plot output, and likelihood profile and profile t traces.

## Optimization MT 1.0

OPTMT optimizes functions. It has many features, including a wide selection of descent algorithms, step-length methods, and “on-the-fly” algorithm switching. Default selections let you use OPTMT with a minimum of programming effort. All you provide is the function to be optimized and start values. OPTMT does the rest.

## Constrained Optimization MT 1.0

COMT minimizes an arbitrary function with general equality and inequality constraints and bounds on the parameters. Algorithms and step length methods may be modified “on the fly.” The default selections let you use COMT with a minimum of programming effort. Supply a function and start values and COMT does the rest.

## Linear Regression MT 1.0

The Linear Regression MT module is a set of procedures for estimating single equations or a simultaneous system of equations. The module allows constraints on coefficients, and heteroskedastic consistent standard errors. It includes two-stage least squares, three-stage least squares, and seemingly unrelated regression procedures.

## Descriptive Statistics MT 1.0

The procedures in DSTAT provides basic statistics for the variables in GAUSS data sets. These statistics describe the numerical characteristics of random variables and provides information for further analysis.

## Nonlinear Equations MT 1.0

The Nonlinear Equations MT module solves systems of nonlinear equations where there are as many equations as unknowns. The current version utilizes new GAUSS functions, significantly increasing accuracy and computational speed.

## Loglinear Analysis MT 1.0

The Loglinear Analysis MT module contains procedures for the analysis of categorical data using loglinear analysis.

## Algorithmic Derivatives v1.0

The Algorithmic Derivatives (AD) module is an application program for generating GAUSS procedures for computing algorithmic derivatives. AD works independently of any application to improve derivatives, and it can be used with any application that uses derivatives.

## Linear Programming MT 4.0

LPMT module is designed to solve small- and large-scale linear programming problems. It is efficient and computationally powerful with thread safe-execution and support for sparse constraint matrices. LPMT provides users the flexibility to solve minimization or maximization problems while specifying constraint types, tolerances, pivoting rules, and more. Complete and informative output includes multiple optimal solutions if they exist, primal and dual solutions, basis variables, dual variables, and solution quality, and iterations log and/or final report if requested.

## CurveFit 3.1

CurveFit applies the Levenberg-Marquardt descent method to the least squares fitting of a nonlinear function or set of nonlinear functions. It includes likelihood profile and profile t traces, and bootstrapped estimation with histogram and surface plot output.

**Econometrics:** AD, Discrete Choice, Linear Regression MT, Time Series MT, Constrained Maximum Likelihood MT, Maximum Likelihood MT, FANPAC MT, Descriptive Statistics MT, Constrained Optimization MT, Optimization MT

**Finance:** AD, Linear Regression MT, Time Series MT, FANPAC MT, Descriptive Statistics MT, Linear Programming MT, Constrained Optimization MT, Optimization MT, Constrained Maximum Likelihood MT, Maximum Likelihood MT

**Engineering/Physics:** AD, CurveFit, Nonlinear Equations MT, Constrained Optimization MT, Optimization MT

**Social Sciences:** AD, Discrete Choice, Descriptive Statistics MT, Linear Regression MT, Loglinear Analysis MT, Constrained Maximum Likelihood MT, Maximum Likelihood MT