

GAUSSX v6.0 Update

By Econotron Software, Inc.

www.Econotron.com

GAUSSTM

Now Available!

New/Recent Features

Optimization Enhancements


- Automatic Differentiation
- Trust Region methodology
- Genetic Algorithm
- Simulated Annealing

New Estimation Processes

- ARFIMA model
- ARMA and ARIMA model
- VARMA model
- Multivariate binomial Probit model
- Fractionally Integrated GARCH
- Feasible MNP (no covariance parameters)
- EM estimation of a Mixed Gaussian distribution
- Double-bounded Dichotomous Choice model
- Markov Switching model
- Stochastic Volatility model
- Robust Estimation including Quantile Regression
- Bayesian estimation using Markov Chain Monte Carlo

Other Enhancements

- Data storage
- Additional FORCST enhancement
- DGP—data generating process
- FILTER command
- FRML evaluation
- Census X12 seasonal adjustment
- Denoising using wavelets
- GAUSS commands in strings
- Procedure file handing
- Cluster Analysis

 **GAUSSX** incorporates a full-featured set of state-of-the-art econometric routines specifically designed for the professional econometrician. These tools, which run under GAUSS, are invaluable both in research and in teaching. The routines can be run under Gausssx, or, since the GAUSS source is included, individual econometric routines can be extracted and integrated in stand-alone GAUSS programs.



Product Details:

- ◆ Gausssx now has automatic differentiation—it uses the new Maple kernel to derive analytic gradients and Hessians for optimization—which is much faster and more accurate than finite differencing. The analytic gradient and Hessian procedures can be stored and reused without having to recreate them.
- ◆ Both genetic (or evolutionary) and simulated annealing search algorithms are included for the non-linear optimization routines.
- ◆ Trust region methods have been implemented for ML, FIML, GMM and NLS. This process defines a region around the current iterate, and then choose the appropriate step in this trust region. Good for hard-to-solve optimization problems.
- ◆ The Autoregressive Fractionally Integrated Moving Average (ARFIMA) process permits the estimation of long memory models. These models are estimated in Gausssx using NLS or ML. Stationary and invertibility conditions are satisfied using constrained optimization. ARIMA and ARMA models are similarly available. For multiple equations, VARMA models are also available.
- ◆ ML estimation of the linear or nonlinear binomial probit model is facilitated by the PROBIT command. Models include univariate, bivariate and trivariate probit.
- ◆ Nine GARCH type models, including EGARCH, MGARCH and FIGARCH. Parameter estimation and conditional variance forecasts are supported.

(Continued Page 2)

Visit <http://www.econotron.com/gausssx/demo> for a product demonstration

Aptech Systems Inc.

23804 SE Kent-Kangley Road ♦ Maple Valley, WA 98038 USA

Phone: (425) 432-7855 ♦ FAX: (425) 432-7832 ♦ info@Aptech.com ♦ URL: www.Aptech.com

- ◆ Feasible MNP (FMNP) permits an MNP estimation without specifying the covariance parameters, which are derived in-process using an SEM algorithm. This procedure is superior to conventional MNP, since it is faster, involves fewer parameters, and generates estimates with smaller variance. Ranked MNP is supported for use when ranked data is available.
- ◆ Estimation of the parameters of a mixed Gaussian distribution using EM. (based on Hamilton).
- ◆ The double bounded dichotomous choice model, typically used in willingness to pay surveys, is estimated using ML.
- ◆ Markov Switching Models (MSM), also estimated using ML, allows a given variable to follow different time series processes over different subsamples. The choice of subsample is determined by a Markov process.
- ◆ SV models are estimated using ML; a quasi maximum likelihood estimate is generated, based on the Kalman Filter algorithm.
- ◆ Robust estimation allows for the estimation of linear models when the distribution of the residuals is unknown. Six methods are available, including quantile regression. Estimated using iterated weighted least squares. (QR is estimated using the interior point algorithm). The parameter covariance matrix is estimated using bootstrapping.
- ◆ Bayesian estimation using MCMC has been implemented with five examples. This implements the Gibbs sampler.
- ◆ Data is stored in RAM as the default—but for large data uses, such as census data, disk storage is a user option.
- ◆ FORCST has been augmented to include conditional variance, best linear prediction, and forecast error. For the LDV case, forecasts include probabilities and category.
- ◆ DGP (Data Generating Process) provides a method for creating a data vector or matrix of a particular type of process, (such as GARCH, probit, linear_t, etc.) used either as a GAUSS or Gaussx command. Currently, 13 processes are supported.
- ◆ The FILTER command filters data using a variety of filters. Current filters are linear, difference (integer and fractional), and ARMA.
- ◆ The FEVAL statement evaluates a type 2 FRML, and stores the result in the Gaussx workspace.
- ◆ The Census X12 Arima method is supported. Options permit a range from default (X12 determines the parameters) up to the entire X12 command set.
- ◆ Time series or signals with noise can be “denoised” using wavelet analysis. The core DWT code is available for other wavelet applications.
- ◆ EVAL evaluates GAUSS commands provided as a string.
- ◆ Cluster analysis creates an hierarchical cluster tree, and optionally graphs the tree - a dendrogram. It can be used in the standard manner of deriving categories across spatial dimensions, or can be used to group observations that are similar based on economic or other characteristics.

Gaussx is produced by Econotron Software, Inc. Product details are available at <http://www.econotron.com>.

Platforms

Available for:

- Windows, LINUX & UNIX
- Requires GAUSS 4.0+*



**Contact Aptech or your local dealer
for pricing and information**

**See our website for the Dealer nearest you:
<http://www.Aptech.com>**