DADiSP / AdvDSP

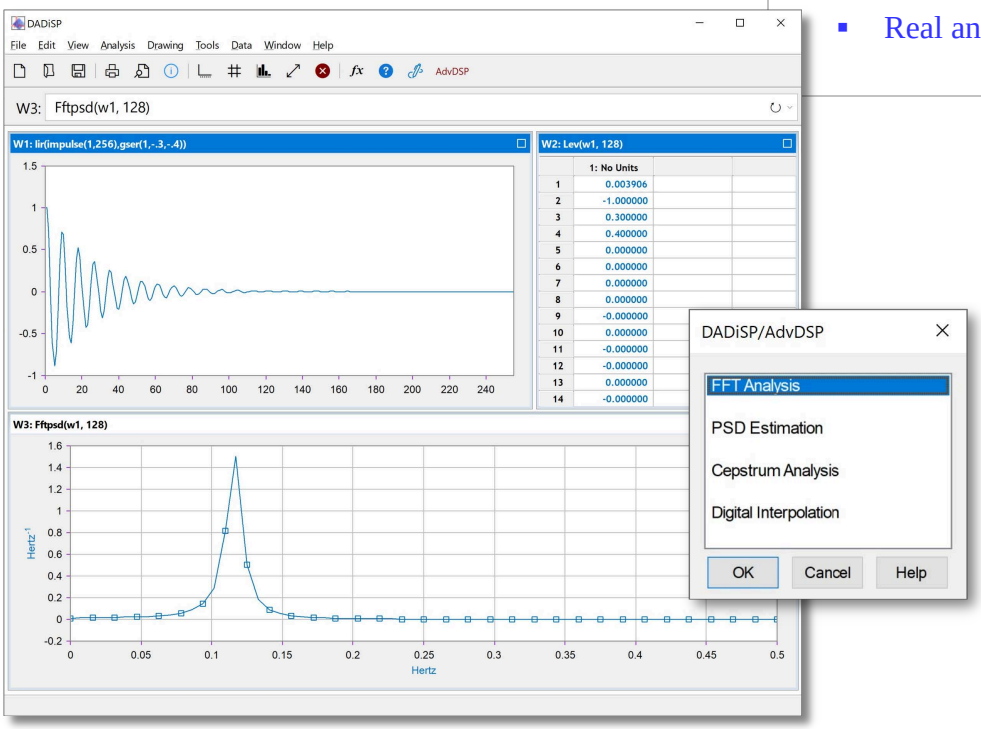
Advanced DSP Module

DADiSP/AdvDSP is a menu-driven module for DADiSP that offers a wide variety of DSP algorithms, including advanced FFT analysis, power spectral density estimation, digital interpolation and cepstrum analysis.

AdvDSP is easy-to-use and allows you to perform sophisticated signal processing without any programming. Each routine is available through a simple dialog box interface or as a direct command line function. Extensive on-line help and examples are also provided.

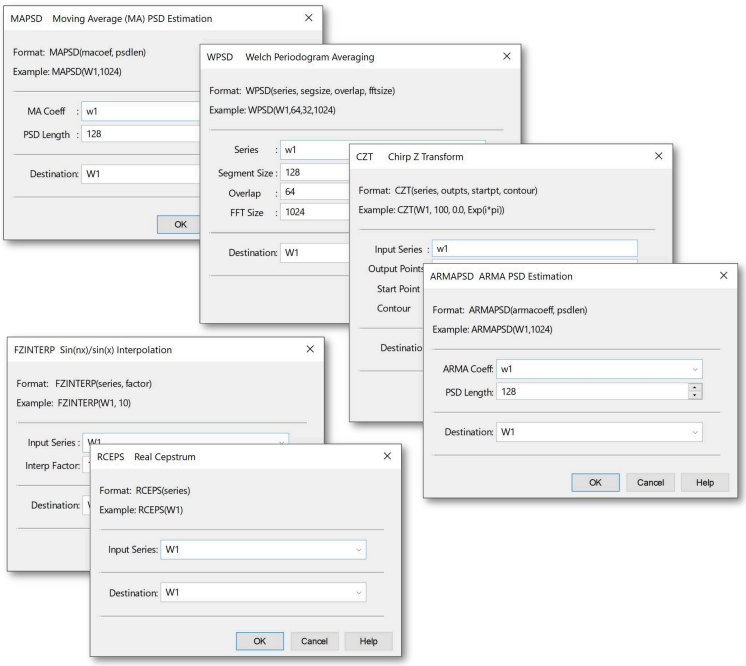
KEY FEATURES

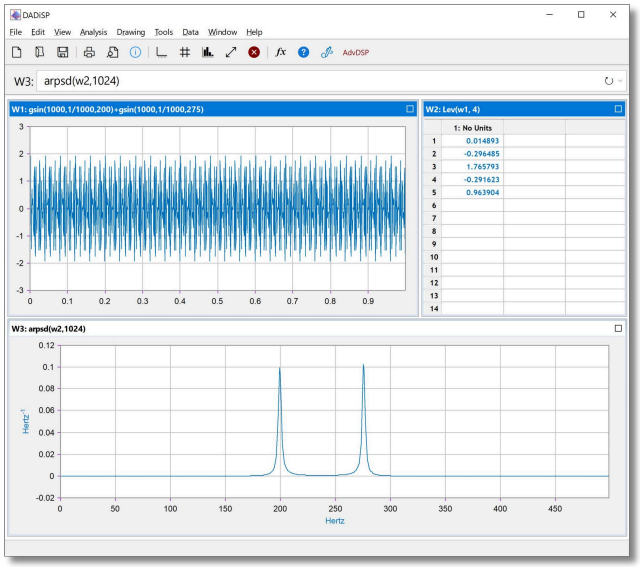
- Simple User Interface
- Classical PSD Estimation
- Parametric AR, MA and ARMA PSD Estimation
- Parametric Linear Prediction
- Zoom FFT and Chirp Z Transforms
- Sinx/x and Zero Insertion Digital Interpolation
- Transfer Function, Cross Power and Coherence Estimate
- Real and Complex Cepstrum Analysis



Advanced DSP Module

DADiSP/AdvDSP is a menu-driven, advanced signal processing module that adds classical and parametric PSD estimation, linear prediction, Zoom FFT, Chirp Z transform, digital interpolation and cepstrum routines. Each routine is available through an easy to use dialog box interface or simple command line functions. On-line help and examples are also provided.





Classical PSD Estimation

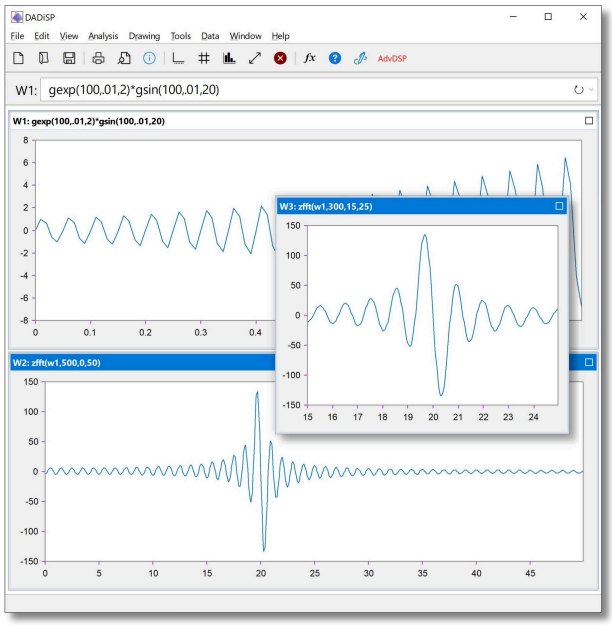
Classical Power Spectrum Estimation techniques include the standard FFT based PSD, the correlation method and the overlapped Welch method of periodogram averaging. Both the segment length and overlap size can be specified. In addition, coherence, cross-power and transfer function estimates are supported.

Parametric PSD Estimation

Parametric estimation techniques include AR - Autoregressive all pole models, MA - Moving Average all zero models, and ARMA, generalized pole and zero models. The model coefficients are computed from measured data and the coefficients can be used to estimate the PSD as well as provide time domain linear prediction results.

Digital Interpolation

The effective sample rate of any waveform can be changed using a variety of robust digital interpolation algorithms. Traditional Sinx/x bandlimited interpolation as well as non-integer multiple zero insertion routines are provided. Classical linear and cubic spline interpolation functions are also included.



Advanced FFT Analysis

AdvDSP can compute a true N point FFT. If the series length is less than the specified FFT size, the series is automatically zero padded. If the FFT size is less than the series length, rather than truncation, the series is time aliased resulting in a properly decimated FFT. The Zoom FFT computes the FFT for a selected frequency range and the Chirp Z transform computes the FFT about a generalized Z plane contour.

Cepstrum Analysis

Both real and complex cepstrum computation is available. Cepstrum analysis simplifies the task of echo identification and cancellation for speech and audio applications.

Advanced DSP Functions

Although most users access DADiSP/AdvDSP through the dialog based interface, DADiSP/AdvDSP includes over 20 standalone functions. The following table is a summary of each function.

Classical PSD Estimation Functions

apsd	Correlation method of PSD estimation
fftpsd	Standard FFT based PSD estimation
wpsd	Welch method of periodogram averaging

Misc Classical PSD Functions

wpxx	wpsd over entire FFT range
wpxy	Cross power spectrum estimate
wtxy	Transfer function estimate
wcoh	Coherence function estimate
wpsdseg	wpsd method with specified number of segments

AR Parametric PSD Estimation Functions

lev	Yule-Walker linear prediction using Levinson recursion
mem	Burg (maximum entropy) method of PSD estimation
covar	Covariance method of linear prediction
arpsd	Compute PSD estimate based on AR coefficients
arpredict	Linear prediction based on AR coefficients

MA Parametric PSD Estimation Functions

ma	Moving average method of PSD estimation
mapsd	Compute PSD estimate based on MA coefficients

ARMA Parametric PSD Estimation Functions

lsmyw	Least Squares Modified Yule-Walker ARMA calculation
armapsd	Compute PSD estimate based on ARMA coefficients

Advanced FFT Analysis Functions

czt	Chirp Z transform
nfft	N point FFT calculation
zfft	Zoom FFT

Digital Interpolation Functions

interp	Linear interpolation
spline	Cubic spline interpolation
fsxinterp	sin(x)/x bandlimited interpolation
fzinterp	Zero insertion interpolation

Cepstrum Functions

rceps	Real cepstrum computation
cceps	Complex cepstrum computation
ldunwrap	Cepstrum phase unwrapping