

RTF-SISO Discrete Control Toolbox.

Version 3.1.0 Jan-01-2008

The RTF-SISO Discrete Control Toolbox is the latest research in discrete control theory in the control industry. The toolbox, which is meant for use with the textbook *Optimal Discrete Control Theory: The Rational Function Structure Model*, consists of 86 MATLAB m functions. The functions are listed below.

General RTF-SISO control functions.

acorrcof - Autocorrelation coefficients.
armaaspc - ARMA autospectrum.
armavar - ARMA variance.
armax2bj - ARMAX to Box-Jenkins.
armax2ss - ARMAX to state space.
armaxspc - ARMA cross-spectra.
autocov - Autocovariances.
bj2armax - Box-Jenkins to ARMAX.
bj2ss - Box-Jenkins to state space.
bjds2pre - B-J disturbance to predictor.
bjpre2ds - B-J predictor to disturbance.
cnpolzer - Controller's poles and zeros.
cntrlind - Controller indices calculation.
crarima - Create an ARIMA model.
crbjcs - Create a Box-Jenkins model.
crosscov - Cross-covariances.
crranpol - Create a random polynomial.
crrtf - Create a transfer function.
crsscs - Create a state space model.
demobj - A demo program.
differns - Difference a polynomial.
diophant - Diophantine equation.
dscretiz - Discretize a continuous T.F..
extrmfrq - Spectrum extremal frequencies.
extrmspc - Extrema of a power spectrum.
ffbd2pre - FF-FB disturbance to predictor.
ffbiovar - FF-FB input output variances.
filterts - Filter a time series.
forcasto - Forecast a future output value.
genarima - Generate an ARIMA model data.
genbjdat - Generate Box-Jenkins model data.
gendetts - Generate a deterministic T.S..
impulcof - Impulse response coefficients.
inv2dfss - S.S. with a differenced input.
iocovarn - Calculate I/O covariances.
iosumsq - Calculate I/O sums of squares.
kalmanfl - The Kalman filters.
lnorms - Calculate the system norms.
nmphschk - Nonminimum phase check.
normarma - Normalize ARIMA model.
opengain - Calculate the open loop gain.
openresp - Open loop response.

parsichk - Parsimony check.
penalty - Calculate penalty constant.
powerspc - Power spectrum.
powerval - Power spectrum value.
predicts - Predict the state vector.
residue0 - Residue at the zero pole.
specfac - Spectral factorization.
specsep - Spectral separation.
ss2armax - S.S. to an ARMAX model.
ss2bj - S.S. to Box-Jenkins model.
ss2css - S.S. to canonical S.S..
ss2invss - S.S. to an innovations S.S..
ss2rtf - S.S. to T.F. model.
ss2tfcon - S.S. algorithm to controller.
stablchk - Stability check.
stepcof - Step response coefficients.
stepresp - Step response of a T.F..
tfspec - Transfer function spectra.
whitnois - White noise generator.
xcorrcof - Cross-covariance coefficients.

Tracking controller functions.

Dahlin - Dahlin controller.
deadbeat - Deadbeat controller.
imc - Internal model controller.
mdahlin - Modified Dahlin controller.
polzercn - Pole zero controller.
vogedcon - Vogel-Edgar controller.

Regulating controller functions.

bjmvcon - Box-Jenkins MV controller.
hinfcon - H-infinity controller.
lqffbcon - Feedforward-feedback controller.
lqgarmax - ARMAX LQG controller.
lqgbj, lqgfbcon - BJ LQG controllers.
lqgss_1, lqgss_n, lqgss - SS controllers.
mvffcon - MV feedforward controller.

Utility functions.

addpoly - Add polynomials.
adjpoly - Adjoint polynomial.
detpoly - Determinant polynomial.
gcdpoly - Greatest common divisor.
invspoly - Inverse polynomial.
mconv - Multiply matrix polynomials.
mdivisor - Matrix polynomial division.
truncate - Polynomial truncation.

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