

The suite contains the folder `Paper_programfiles` which contains the following three folders:

- (1) `common`.
- (2) `Daubechies_periodic`.
- (3) `Daubechies_nonperiodic`.

The Matlab files in the folder named 'common' are required for the execution of the Matlab functions present in both the folders 'Daubechies\_nonperiodic' and 'Daubechies\_periodic'. Add this folder in the directory of your Matlab using `setpath`.

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Summary of the Matlab files in the folder 'common':

- (1) `cascade.m`:  $\phi$  and  $\psi$  at dyadic rationals.
  - (2) `dstmat.m`: Discrete scaling function transformation matrix.
  - (3) `dst.m`: Discrete scaling function transformation.
  - (4) `idst.m`: Inverse discrete scaling function transformation.
  - (5) `moments.m`: Moments of scaling function  $\phi(x)$ .
  - (6) `tmoments.m`: Moments of translates of scaling function.
  - (7) `conn.m`: Connection coefficients.
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The folder 'Daubechies\_periodic' contains two folders:

- (1) `Daub_per_Gal`.
- (2) `Dau_per_Collo`.

Summary of the Matlab files in the folder `Daub_per_Gal`:

- (1) `gal_difmatrix_periodic.m`: Differentiation matrix.
- (2) `gal_diff_periodic`: Differentiation of the function.

Summary of the Matlab files in the folder Daub\_per\_Collo:

- (1) `cascade_der.m`:  $\phi^{(d)}$  and  $\psi^{(d)}$  at dyadic rationals.
  - (2) `collo_difmatrix_periodic.m`: Differentiation matrix.
  - (3) `collo_diff_periodic.m`: Differentiation of the function.
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Summary of the Matlab files in the folder Daubechies\_nonperiodic:

- (1) `L_daubfilt.m`: Left hand low pass filter coefficients.
  - (2) `R_daubfilt.m`: Right hand low pass filter coefficients.
  - (3) `L_alpha.m` and `R_alpha.m`:  $\alpha_{m,i}^L$  and  $\alpha_{m,i}^R$  respectively.
  - (4) `L_firstsum_alpha.m` and `R_firstsum_alpha.m`: Called by `L_alpha.m` and `R_alpha` respectively.
  - (5) `L_phi.m`: and `R_phi.m`:  $\phi_k^L(x)$  and  $\phi_k^R(x)$  for  $x \neq 0$  respectively.
  - (6) `L_firstsum_phi.m` and `R_firstsum_phi.m`: Called by `L_phi.m` and `R_phi.m` respectively.
  - (7) `L_phi_origin.m` and `R_phi_origin.m`:  $\phi_k^L(0)$ ,  $\rho_{k,k}^L$  and  $\phi_k^R(0)$ ,  $\rho_{k,k}^L$  respectively.
  - (8) `L_ro.m` and `R_ro.m`:  $\rho_{k,p}^L$  and  $\rho_{k,p}^R$ .
  - (9) `L_partialsum_ro.m` and `R_partialsum_ro.m`: Called by `L_ro.m` and `R_ro.m`.
  - (10) `gal_difmatrix_nonper.m`: Differentiation projection matrix.
  - (11) `L_moments.m` and `R_moments.m`: Moments of left hand side and right hand side boundary functions respectively.
  - (12) `LR_partial_mom`: Called by `L_moments.m` and `R_moments.m`.
  - (13) `dstmat_nonper.m`: Quadrature matrix.
  - (14) `gal_diff_nonper.m`: Differentiation matrix.
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There are two Matlab files ‘test\_J.m’ and ‘test\_D.m’ present in the directory

Paper\_programfiles\Daubechies\_periodic\Daub\_per\_Gal

The function ‘test\_J.m’ will ask for the period of the function, order of differentiation and the function to be differentiated and will return a graph showing the convergence with respect to  $J$ . Similarly ‘test\_D.m’ will show the convergence with respect to  $D$ .