Wavelet Methods for Time Series Analysis

Don Percival

Applied Physics Laboratory
Box 355640
University of Washington
Seattle, WA 98195–5640

206–543–1368

dbp@apl.washington.edu

http://faculty.washington.edu/dbp

Overview of Short Course: I

- welcome!
- five day course will consist of four sessions each day (two in the morning and two in the afternoon, each about 45 minutes long)
- Monday

1: introduction to wavelets and wavelet transforms (Part I)

2: introduction to the discrete wavelet transform (Part II)

3 & 4: basic theory for discrete wavelet transform (Part III)

- Tuesday

1 & 2: MODWT & examples of DWT/MODWT analysis (Part IV)

3: wavelet packet transforms and best bases (Part V)

4: `R` software demonstration

Overview of Short Course: II

- Wednesday

1: matching pursuit (Part VI)

2 & 3: wavelet variance and covariance (Part VII)

4: `R` software demonstration

- Thursday

1 & 2: analysis & synthesis of long memory processes (Part VIII)

3: wavelet-based bootstrapping (Part IX)

4: wavelet-based signal extraction and denoising (Part X)

- Friday

1 & 2: wavelet-based signal extraction and denoising (conclusion)

3: `R` software demonstration

4: continuous wavelet transforms (Part XI)

Resources

- lectures notes bases upon *Wavelet Methods for Data Analysis*, D. B. Percival and A. T. Walden, Cambridge University Press, Cambridge, UK, 2000
- software in Matlab:

  `WMTSA`: `http://www.atmos.washington.edu/~wmtsa` (*)

  `WaveCov`: `http://www.image.ucar.edu/staff/whitcher/software/` (*)

  `wavelab`: `http://www-stat.stanford.edu/~wavelab/`
- software in S-Plus: `S+Wavelets 2.0` (commercial) (*)
- software in `R`

  `wavethresh`: `http://cran.r-project.org`

  `wavelets`: `http://cran.r-project.org` (*)
  (this and `wavethresh` available via 'Packages' sidebar item under 'Software')

  `WaveCov`: `http://www.image.ucar.edu/staff/whitcher/software/` (*)

  `waveslim`: `http://www.image.ucar.edu/staff/whitcher/software/` (*)
- note: if any of these links break, go to

  `http://faculty.washington.edu/~dbp/WMTSA/software.html`

  or e-mail Don Percival (`dbp@apl.washington.edu`) to get new link

(*) indicates software compatible with conventions used in course notes and book