



LUNDS
UNIVERSITET

Matematikcentrum
Matematisk statistik

28 augusti 2006

Doktorandkurs: Wavelet Methods for Time Series Analysis

Matematisk Statistik har av STINT beviljats ett anslag för samarbete med University of Washington. Som ett led i detta kommer Professor Don Percival, Applied Physics Laboratory, att ge en doktorandkurs i wavelets baserad på boken "Wavelet Methods for Time Series Analysis", Cambridge University Press, 2000, av Donald B. Percival och Andrew T. Walden. (Jag har ett exemplar av boken om någon vill titta i den.) Kursen kommer att hållas under tiden 9/10 till 13/10 i MH309A/MH313, som efter ombyggnaden i Matematikhuset skall fungera som ett större seminarierum.

För anmälan till kursen kontakta Ulla Holst (ulla@maths.lth.se).

Detaljerade frågor om kursinnehållet besvaras lämpligen av föreläsaren själv (dbp@apl.washington.edu).

Nedan följer en utförligare beskrivning av kursinnehållet och en tidsplan för lektionerna:

Short Course: Wavelet Method for Time Series Analysis

There will be a five day short course on wavelets October 9th through 13th at Lund University. The course will be taught by Don Percival, who is co-author (with Andrew Walden) of the book 'Wavelet Methods for Time Series Analysis', Cambridge University Press, 2000. The course will consist of twenty sessions in all (four per day), each of which will be 45 to 50 minutes long. Sixteen of the sessions will be lectures covering the following topics: an introduction to wavelet analysis; the discrete wavelet transform (DWT); the maximal overlap DWT (MODWT); use of the DWT and MODWT for exploratory data analysis; wavelet packet transforms and the best basis algorithm; matching pursuit; the wavelet variance (or spectrum) and covariance; analysis and synthesis of long memory processes; wavelet-based bootstrapping; wavelet-based signal extraction; and the wavelet analysis of finite energy signals. The remaining four sessions will offer additional examples of wavelet analysis through computer demonstrations in the statistical language R.

Time Schedule

Monday, October 9

10.15–12

Lecture 1: introduction to wavelet analysis.

Lecture 2: overview of the discrete wavelet transform.

14.15–16

Lecture 3: details about the discrete wavelet transform.

Software Demo 1: examples of DWT analysis.

Tuesday, October 10

10.15–12

Lectures 4 and 5: MODWT and examples of use of DWT/MODWT.

14.15–16

Lecture 6: DWPT, best basis, MODWPT.

Software Demo 2: examples of analysis in lectures 4, 5 and 6.

Wednesday, October 11

10.15–12

Lecture 7: matching pursuit.

Lecture 8: wavelet variance/covariance, part 1.

14.15–16

Lecture 9: wavelet variance/covariance, part 2.

Software Demo 3: examples of wavelet variance analysis.

Thursday, October 12

10.15–12

Lectures 10 and 11: analysis/synthesis of long memory processes.

14.15–16

Lecture 12: wavelet-based bootstrapping.

Lecture 13: wavelet-based signal extraction, part 1.

Friday, October 13

10.15–12

Lecture 14: wavelet-based signal extraction, part 2.

Software Demo 4: wavelet-based signal extraction.

14.15–16

Lectures 15 and 16: wavelet analysis of finite energy signals.

Välkomna!

Ulla Holst