

Datorseende (CVL)

LiU » ISY » Datorseende » Utbildning » Doktorandkurser » Introductory Course on Spectral Clustering

Introductory Course on Spectral Clustering

Course schedule

The course is given in the second half of the spring semester (VT2).

The dates are

Tuesday 22/5/2012, 15-17

Thursday 24/5/2012, 10-12

Tuesday 29/5/2012, 15-17

All lectures are given in seminar room **Signalen** at the Department of Electrical Engineering.

Preliminary lecture plan

- ▶ Lecture 1: An overview of the clustering problem, graph theory and segmentation, introduction to concepts in spectral clustering [[Lecture slides](#)]
- ▶ Lecture 2: Algorithms for spectral clustering, **A** , **D** and **L** and their eigensystems [[Lecture slides](#)]
- ▶ Lecture 3: Extensions: multi-way affinities, multiple cues + competing methods, enhancing SC [[Lecture slides](#)]

Exercises

Students can propose their own problems to work on, but example problems/data to work on will also be available.

For those who wish to use our example problems and data you can download them [here](#) .

Instructions [here](#) .

Results of the exercises will probably be presented at a seminar

Preliminary, the course gives 3hp credits (=2 weeks full time work)

Literature

- ▶ Ulrike von Luxburg, *A tutorial on spectral clustering* , Stat Comput (2007) 17:395-416
- ▶ Ulrike von Luxburg , *A tutorial on spectral clustering* , Technical Report No TR-149, Max-Planck Institute for Biological Cybernetics, 2007 (A longer version of the journal paper)
- ▶ Shi & Malik, *Normalized cuts and image segmentation* , PAMI 22(8), 888-905, 2000
- ▶ Ng, Jordan & Weiss, *On spectral clustering: analysis and an algorithm* , in "Advances in Neural Information Processing Systems" 14, 849-856, 2002
- ▶ Kumar & Daumé, *A Co-training Approach for Multi-view Spectral Clustering* , ICML, 2011
- ▶ Govindu, *A Tensor Decomposition for Geometric Grouping and Segmentation* , CVPR 2005
- ▶ Chen & Lerman, *Spectral Curvature Clustering* , International Journal of Computer Vision, 81:317-330, 2009
- ▶ Fowlkes, Belongie, Chung & Malik, *Spectral Clustering Using the Nyström Method* , IEEE Transaction on Pattern Analysis and Machine Intelligence, 26(2), 2004

Contact information

To express interest in the course, please send an email to

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- ▶ Klas Nordberg: klas@isy.liu.se

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