

Topics and literature for the LMU seminar (summer term 2004):

## Stochastic Models of Complex Biological Systems

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<b>Date:</b>	<b>Topic and References:</b>	<b>Speaker:</b>
22 April	Introduction and overview	<b>K. Strimmer/L. Held</b>
29 April	Structural equations models [M. Xiong, J. Li and X. Fang. 2004. Identification of genetic networks. <i>Genetics</i> 166:1037-1052]	<b>A.-L. Boulesteix</b>
6 May	Bayesian networks [N. Friedman. 2004. Inferring cellular networks using probabilistic graphical models. <i>Science</i> 303:799-805]	<b>J. Schäfer</b>
27 May	State space models [C. Rangel et al. 2004. Modelling T-cell activation using gene expression profiling and state space models. <i>Bioinformatics in press</i> (available as advance access preprint)]	<b>L. Fahrmeir</b>
3 June	Large-scale graphical models [A. Dobra et al., M. West. 2004. Sparse graphical models for exploring gene expression data. <i>J. Multiv. Analysis. in press</i> (preprint available from <a href="http://www.samsi.info/TR/tr2003-07.pdf">http://www.samsi.info/TR/tr2003-07.pdf</a> )]	<b>C. Best</b>
17 June	Network statistics [A.-L. Barabasi. 2004. Network biology: understanding the cell's functional organization. <i>Nature Reviews Genetics</i> 5:101-113 R. Albert and A.L. Barabas. 2002. Statistical mechanics of complex networks. <i>Rev. Mod. Phys.</i> 74:47-97]	<b>R. Opgen-Rhein</b>
24 June	Evolutionary game theory in biochemical networks [T. Pfeiffer et al. 2001. Cooperation and competition in the evolution of ATP-producing pathways. <i>Science</i> 292:504-507 T. Frick and S. Schuster. 2003. An example of the prisoner's dilemma in biochemistry. <i>Naturwissenschaften</i> 90:327-331]	<b>B. Hellriegel</b>
1 July	Constraint-based modeling of bacterial networks [M.W. Covert et al. 2004. Integrating high-throughput and computational data elucidates bacterial networks. <i>Nature</i> 429:92-96 J. Reed and B. O. Palsson. 2003. Thirteen yeers of building constraint-based in silico models of <i>Escherichia coli</i> . <i>J. Bact.</i> 185:2692-2699]	<b>E. Mendoza</b>
8 July	Biochemical systems theory [D.J. Wilkinson. 2004. Stochastic systems biology (lecture notes). <a href="http://www.staff.ncl.ac.uk/d.j.wilkinson/teaching/csc859/notes.pdf">http://www.staff.ncl.ac.uk/d.j.wilkinson/teaching/csc859/notes.pdf</a> P.J.E. Goss and J. Peccoud. 2000. Quantitative modeling of stochastic system in molecular biology by using stochastic Petri nets. <i>PNAS</i> 95:6750-6755]	<b>M. Höhle</b>
15 July	Reaction network inference [X.-J. Feng and H. Rabitz. 2004. Optimal identification of reaction networks. <i>Biophys. J.</i> 86:1270-1281]	<b>K. Thierfelder</b>
22 July	Evolution of protein networks [G. D. Amoutzias et al. 2004. Convergent evolution of gene networks by single-gene duplications in higher eukaryotes. <i>EMBO Reports</i> 5:274-279 A. Wagner. 2003. How the global structure of protein interaction networks evolves. <i>Proc. R. Soc. Lond B</i> 270:457-466]	<b>G. Jobb</b>