1 Nihat Ay & Guido Montufar: Geometric Aspects of Graphical Models and Neural Networks

Name:	Nihat Ay & Guido Montufar	**Group:**	Ay
Title of Lecture:	*Geometric Aspects of Graphical Models and Neural Networks*		
Target audience:	MSc students, PhD students, Postdocs	**Exp. #:**	10-20
Date and room:	Wednesday 10.15–11.45 First lecture Nov.26 room A02	**Language:**	English
Content (Keywords):	Information theory, Boltzmann machines, geoemtric aspects of networks		
Abstract:	The first part of this course introduces the basic theory of finite random fields and corresponding geometric structures studied in information geometry. Topics include sampling algorithms and their convergence properties. Graphical models (an important class of random fields) will be discussed in more detail. The second part of the course deals with neural networks. We discuss Boltzmann machines (a kind of stochastic neural networks) and elaborate on related network architectures that have become prominent in machine learning applications (including restricted Boltzmann machines, deep belief networks, and deep Boltzmann machines). We will concentrate on geometric aspects of the different networks, addressing, in particular, the geometry of their parametrization and their expressive power.		
Prerequisites:			
Remarks:			