STANFORD UNIVERSITY

DEPARTMENT OF STATISTICS

DEPARTMENT SEMINAR

4:15 p.m., Wednesday, July 10, 2002
Sequoia Hall Room 200
(Cookies at 3:45 in 1st Floor Lounge)

Aapo Hyvarinen
Helsinki University of Technology

Independent Components Analysis: sparsity and extensions

The talk will be an expository talk on ICA based on the following papers.

A. Hyvrinen, P.O. Hoyer and M. Inki. "Topographic Independent Component Analysis." Neural Computation, 13(7):1525-1558, 2001.

This paper introduces an extension of ICA. The dependencies of the estimated "independent" components are visualized as a topographic order. A new principle for topographic organization, based on higher-order statistics. Applied on image data, both topography and complex cell properties emerge.

A. Hyvrinen and P.O. Hoyer. "Emergence of phase and shift invariant features by decomposition of natural images into independent feature subspaces." Neural Computation, 12(7):1705-1720, 2000.

This paper presents a simpler extension of ordinary ICA which was a precursor of topographic ICA. Here the goal of independence of scalar independent components is replaced by the independence of the norms of projections on certain subspaces. This is applied on image data, and complex cell properties are shown to emerge.