FINAL PROGRAM

The Second International Workshop on Independent Component Analysis and Blind Signal Separation (ICA2000)
June 19-22, 2000, Helsinki/Espoo, Finland

June 12, 2000

SUNDAY, JUNE 18

16:00 - 18:00 **Early registration**

MONDAY, JUNE 19

8:00 - 9:50 **Registration**

9:50 - 10:05 **Opening of the workshop**

10:05 - 10:50 **Session A: Invited talk 1**
Chair: J. Karhunen, Finland

Prof. C. Jutten and A. Taleb
INPG-LIS, Grenoble, France; ATRI, Perth, Australia
Source Separation: From Dusk Till Dawn

10:50 - 11:10 **Coffee break**

11:10 - 12:30 **Session B: Theory**
Chair: L. de Lathauwer, Belgium

11:10 - 11:30 L. Zhang and A. Cichocki
RIKEN Brain Science Institute, Saitama, Japan
Natural Gradient Approach to Blind Deconvolution of Dynamical Systems

11:30 - 11:50 A. Yeredor
Dept. of Electr. Eng. - Systems, Tel-Aviv Univ., Israel
Approximate Joint Diagonalization Using Non-Orthogonal Matrices

11:50 - 12:10 M. Kawanabe and N. Murata
University of Tokyo, Japan
RIKEN, Brain Science Institute, Saitama, Japan
Independent Component Analysis in the Presence of Gaussian Noise Based on Estimating Functions

12:10 - 12:30 S. Hochreiter and M. Mozer
University of Colorado, Boulder, CO, USA
An Electric Field Approach to Independent Component Analysis

12:30 - 14:00 **Lunch**

14:00 - 16:10 **Session C: Poster 1**
Coffee and refreshments are served during the session.

I. Kopriva and H. Szu
Institute for Defense Studies, Zagreb, Croatia
ONR, Arlington, Virginia, USA
Blind Discrimination of the Coherent Optical Sources by Using Reticle Based Optical Trackers is a Nonlinear ICA Problem

F. Asano, Y. Motomura, H. Asoh, and T. Matsui
Electrotechnical Laboratory, Tsukuba, Japan
Effect of PCA Filter in Blind Source Separation

S. Cruces, A. Cichocki, and L. Castedo
University of Seville, Spain; University of La Coruna, Spain
RIKEN, Brain Science Institute, Wako-Shi, Japan
Blind Source Extraction in Gaussian Noise

G. Darbellay and P. Tichavsky
Signal Processing Laboratory, EPFL, Lausanne, Switzerland
Academy of Sciences, Prague, Czech Republic
Independent Component Analysis Through Direct Estimation of the Mutual Information

D. Erdogmus and J. Principe
University of Florida, Gainesville, Florida, USA
Comparison of Entropy and Mean Square Error Criteria in Adaptive System Training Using Higher Order Statistics

M. Joho, H. Mathis, and R. Lambert
Swiss Federal Institute of Technology, Zurich, Switzerland
Pivotal Technologies, Pasadena, California, USA
Overdetermined Blind Source Separation: Using More Sensors Than Source Signals in a Noisy Mixture

P. Bofill and M. Zibulevsky
Technical University of Catalunya, Spain
University of New Mexico, Albuquerque, New Mexico, USA
Blind Separation of More Sources Than Mixtures Using Sparsity of Their Short-Time Fourier Transform

G. Hori
Brain Science Institute, RIKEN, Saitama, Japan
A New Approach to Joint Diagonalization

K. Diamantaras and E. Chassioti
Technical Education Inst. of Thessaloniki, Sindos, Greece
University of Athens, Athens, Greece
Blind Separation of n Binary Sources from One Observation:
a Deterministic Approach

D. Nuzillard and A. Bijaoui
University of Reims Champagne-Ardenne, Reims, France
Observatory of Cote d'Azur, Nice, France
Blind Source Separation of Astronomical Images

R. Cristescu, T. Ristaniemi, J. Joutsensalo, and J. Karhunen
Helsinki Univ. of Tech., Neural Networks Research Centre, Finland
University of Jyväskylä, Jyväskylä, Finland
Delay Estimation in CDMA Communications Using a Fast ICA Algorithm

I. Schiessl, H. Schöner, M. Stetter, A. Dima, and K. Obermayer
Dept. of Computer Sci., Technical Univ. of Berlin, Berlin, Germany
Regularized Second Order Source Separation

M. Haritopoulos, Y. Naudet, and A. Billat
LAM, University of Reims Champagne-Ardennes, Reims, France
Enhancing Usefulness of Aperiodic Stochastic Resonance in the
Improvement of BSS Applied on an Eddy Current Sensor Nonlinear Response

J. Igual and L. Vergara
Universidad Politecnica Valencia, Valencia, Spain
Prior Information About Mixing Matrix in BSS-ICA Formulation

A. Ziehe, G. Nolte, G. Curio, and K.-R. Müller
GMD FIRST.IDA, Berlin, Germany; UKBF, FU Berlin, Berlin, Germany
University of Potsdam, Potsdam, Germany
OFI: Optimal Filtering Algorithms for Source Separation

P. Penev, M. Gegiu, and E. Kaplan
The Rockefeller University, New York, NY, USA
Mount Sinai School of Medicine, New York, NY, USA
Fast Convergent Factorial Learning of the Low-Dimensional Independent
Manifolds in Optical Imaging Data

N. Kanlis, J. Simon, and S. Shamma
University of Maryland at College Park, Maryland, USA
Complete Analysis of the Training of Feedback Architecture Networks
that Perform Blind Source Separation and Deconvolution

A. Budillon, F. Palmieri, and R. Varriale
Universita di Napoli Federico II, Napoli, Italy
A Hybrid Method for Blind Signal De-Noising via Independent
Component Analysis

J. Barnard and C. Aldrich
University of Stellenbosch, Stellenbosch, South Africa
State Space Modelling of Multivariate Dynamic Process Systems by Use of Independent Component Analysis

S. Douglas and X. Sun
Southern Methodist University, Dallas, Texas, USA
Blind Signal Separation of Arbitrary Mixtures: Adaptive Algorithms and Stability Analyses

L. Almeida
INESC, Lisboa, Portugal
Simultaneous MI-Based Estimation of Independent Components and of Their Distributions

16:10 - 16:25 **Break**

16:25 - 18:05 **Session D: Temporal models**
Chair: A. Cichocki, Japan

16:25 - 16:45 A. Hyvärinen
Helsinki Univ. of Tech., Neural Networks Research Centre, Finland
Complexity Pursuit: Combining Nongaussianity and Autocorrelations for Signal Separation

16:45 - 17:05 M. Zibulevsky and B. Pearlmutter
Dept. of Computer Sci. Univ. of New Mexico, Albuquerque, NM, USA
Blind Separation of Sources with Sparse Representations in a Given Signal Dictionary

17:05 - 17:25 J.-F. Cardoso and D.-T. Pham
CNRS, ENST-TSI, Paris, France
CNRS/UJF/INPG, Grenoble, France
Blind Separation of Instantaneous Mixtures of Non Stationary Sources

17:25 - 17:45 J. Solé i Casals, C. Jutten, and A. Taleb
Universitat de Vic, Catalunya, Spain
INPG-LIS, Grenoble, France
Source Separation Techniques Applied to Linear Prediction

17:45 - 18:05 P. Krishnaprasad, Y. Qi, and S. Shamma
Institute for Systems Research, University of Maryland, MD, USA
The Subband-Based Independent Component Analysis

18:05 - 18:30 **Break and walk to get-together party (5 min.)**

18:30 - 20:30 **Get-together party at Villa Karhusaari**

TUESDAY, JUNE 20

9:00 - 10:00 **Session E: Convolutive mixtures**
Chair: D.-T. Pham, France

9:00 - 9:20 R. Liu, Y. Inouye, and H. Luo
University of Notre Dame, Notre Dame, Indiana, USA
Shimane University, Shimane, Japan
AT&T Research Lab, Red Bank, New Jersey, USA
A System Theoretic Foundation for Blind Separation of MIMO-FIR Convolutive Mixtures - A Review

9:20 - 9:40 L. De Lathauwer, B. De Moor, and J. Vandewalle
K.U. Leuven, Dept. of Electr. Eng. (ESAT), Leuven, Belgium
An Algebraic Approach to Blind MIMO Identification

9:40 - 10:00 J. Anemüller and B. Kollmeier
Carl von Ossietzky-Universität, Oldenburg, Germany
Amplitude Modulation Decorrelation for Convolutive Blind Source Separation

10:00 - 10:20 **Break**

10:20 - 11:20 **Session F: Instantaneous mixtures**
Chair: S. Douglas, USA

10:20 - 10:40 H. Mathis, T. von Hoff, and M. Joho
Swiss Federal Institute of Technology, Zurich, Switzerland
Blind Separation of Mixed-Kurtosis Signals Using an Adaptive Threshold Nonlinearity

10:40 - 11:00 J. Eriksson, J. Karvanen, and V. Koivunen
Helsinki Univ. of Technology, Signal Processing Laboratory, Finland
Source Distribution Adaptive Maximum Likelihood Estimation of ICA Model

11:00 - 11:20 P. Pajunen and H. Lappalainen
Helsinki Univ. of Technology, Neural Networks Research Centre, Finland
Fast Algorithms for Bayesian Independent Component Analysis

11:20 - 11:40 **Coffee break**

11:40 - 12:40 **Session G: Extensions of the linear ICA/BSS model**
Chair: L. Almeida, Portugal

11:40 - 12:00 T.-W. Lee and M. Lewicki
University of California, San Diego, California, USA
Carnegie Mellon University, San Diego, California, USA
The Generalized Gaussian Mixture Model Using ICA

12:00 - 12:20 N. Saito, J.-J. Lin, and R. Levine
Department of Mathematics, University of California, Davis, CA, USA
An Iterative Nonlinear Gaussianization Algorithm for Resampling
Dependent Components

12:20 - 12:40 H. Lappalainen
Helsinki Univ. of Technology, Neural Networks Research Centre, Finland
Nonlinear Independent Component Analysis Using Ensemble Learning: Theory

12:40 - 14:05 **Lunch**

14:05 - 14:50 **Session H: Invited talk 2**
Chair: V. Koivunen, Finland

Prof. U. Madhow
Univ. of California, Santa Barbara, CA, USA
Multiuser Detection: An Overview and a New Result

14:50 - 15:00 **Break**

15:00 - 17:10 **Session I: Poster 2**
Coffee and refreshments are served during the session.

M. Kawamoto, A. Barros, K. Matsuoka, and N. Ohnishi
Shimane University, Shimane, Japan
RIKEN, Saitama, Japan
A Method of Real-World Blind Separation Implemented in Frequency Domain

C. Puntonet, C. Bauer, E. Lang, M. Alvarez, and B. Prieto
University of Granada, Granada, Spain
Univesity of Regensburg, Regensburg, Germany
Adaptive-Geometric Methods: Application to the Separation of EEG Signals

C. Fyfe and P. Lai
University of Paisley, Paisley, Scotland
ICA Using Kernel Canonical Correlation Analysis

Y. Zhang and S. Kassam
Dept. of Electrical Engineering, Univ. of Pennsylvania, PA, USA
Multichannel Blind Source Separation and Blind Equalization
Using Fractional Sampling

J. Lee, J. Ahn, M. Jang, K. Park, and D. Lee
Seoul National University College of Medicine, Seoul, Korea
Blind Separation of Spatially Independent Components from $H_2{}^{15}O$
Dynamic Myocardial Positron Emission Tomography

Y. Matsuyama, N. Katsumata, Y. Suzuki, and S. Imahara
Waseda University, Tokyo, Japan
The α-ICA Algorithm

Y. Owechko
HRL Laboratories, LLC, Malibu, California, USA
Hybrid ICA/Classical Adaptive Beamforming for Self-Organizing Collaborative Wireless Networks

K. Suzuki, T. Kiryu, and T. Nakada
Brain Research Institute, University of Niigata, Japan
An Efficient Method for Independent Component – Cross Correlation – Sequential Epoch Analysis of Functional Magnetic Resonance Imaging

C. Mejuto, A. Dapena, and L. Castedo
Universidad de La Coruña, La Coruña, Spain
Frequency-Domain Infomax for Blind Separation of Convolutive Mixtures

D. Nuzillard
L.A.M. Université de Reims Champagne-Ardenne, Reims, France
Separation of Non Orthogonal Spectral Data

S. Ikeda
PRESTO, JST, RIKEN, Saitama, Japan
Factor Analysis Preprocessing for ICA

R. Huez, F. Belloir, and A. Billat
Université de Reims Champagne-Ardenne, Reims, France
How BSS Can Be Used on Eddy Current Sensor Based on Induction Balance Principle

A. Turiel and N. Parga
Ecole Normale Supérieure, Paris, France
Universidad Autónoma de Madrid, Madrid, Spain
Wavelet Based Decomposition of Natural Images in Independent Resolution Levels

J. Murillo-Fuentes and F. Gonzáles-Serrano
Escuela Politécnica Superior, Universidad Carlos III de Madrid, Madrid, Spain
Higher Order Moments Algorithms for Blind Signal Separation

H. Lappalainen, X. Giannakopoulos, A. Honkela, and J. Karhunen
Helsinki Univ. of Tech., Neural Networks Res. Centre, Espoo, Finland
IDSIA, Manno, Switzerland
Nonlinear Independent Component Analysis Using Ensemble Learning: Experiments and Discussion

T. Ndjountche and R. Unbehauen
Erlangen-Nurnberg University, Erlangen, Germany
On the Noise Reduction using Wavelet Transforms

R. Vigario
Helsinki Univ. of Tech., Neural Networks Res. Centre, Espoo, Finland
Dipole Modeling in FastICA Decomposition of Evoked Responses

P. Fabry, C. Serviére
LIS-ENSIEG, Saint-Martin d'Héres, France
Blind Separation of Noisy Harmonic Signals Using Orthogonal Techniques for Rotating Machine Diagnosis

K. Rahbar and J. Reilly
Electrical and Computer Engineering, McMaster University, Hamilton, Canada
Geometric Optimization Methods for Blind Source Separation of Signals

C. Andrieu and S. Godsill
Signal Processing Lab, University of Cambridge, Cambridge, UK
A Particle Filter for Model Based Audio Source Separation

A. Tang, D. Phung, B. Pearlmutter, and R. Christner
University of New Mexico, Albuquerque, NM, USA
Localization of Independent Components from Magnetoencephalography

17:10 - 17:25 **Break**

17:25 - 18:25 **Session J: Applications 1**
Chair: J. Principe, USA

17:25 - 17:45 M. Valkama, M. Renfors, and V. Koivunen
Tampere University of Technology, Telecommunications Lab. Finland
Helsinki University of Technology, Signal Processing Lab. Finland
BSS Based I/Q Imbalance Compensation in Communication Receivers in the Presence of Symbol Timing Errors

17:45 - 18:05 J. Miskin and D. MacKay
Cambridge University, Cambridge, United Kingdom
Application of Ensemble Learning ICA to Infra-Red Imaging

18:05 - 18:25 A. Ypma and A. Leshem
Delft University of Technology, Delft, The Netherlands
Blind Separation of Machine Vibration with Bilinear Forms

18:30 - 19:40 **Dinner**

WEDNESDAY, JUNE 21

9:00 - 10:20 **Session K: Speech and audio signals**
Chair: K. Torkkola, USA

9:00 - 9:20 F. Asano and S. Ikeda
Electrotechnical Laboratory, Tsukuba, Japan
RIKEN, Wako-shi, Japan
Evaluation and Real-Time Implementation of Blind Source Separation System Using Time-Delayed Decorrelation

9:20 - 9:40 J.-H. Lee, H.-Y. Jung, T.-W. Lee, and S.-Y. Lee
Brain Science Research Center and Depart. of Electrical Engineering, KAIST, Korea
Speech Coding and Noise Reduction Using ICA-Based Speech Features

9:40 - 10:00 A. Barros, H. Kawahara, A. Cichocki, S. Kajita, T. Rutkowski, M. Kawamoto, and N. Ohnishi
RIKEN, Japan; Wakayama University, Japan; Nagoya University, Japan
UFMA, Brazil; Shimane University, Japan
Enhancement of a Speech Signal Embedded in Noisy Environment Using Two Microphones

10:00 - 10:20 R. Balan and J. Rosca
Siemens Corporate Research, Princeton, NJ, USA
Statistical Properties of STFT Ratios for Two Channel Systems and Applications to Blind Source Separation

10:20 - 10:40 **Coffee break**

10:40 - 12:00 **Session L: Applications 2**
Chair: C. Fyfe, United Kingdom

10:40 - 11:00 A. Kaban and M. Girolami
University of Paisley, Paisley, Scotland
Clustering of Text Documents by Skewness Maximization

11:00 - 11:20 F. Acernese, A. Ciaramella, S. De Martino, M. Falanga, and R. Tagliaferri
Università di Salerno, Baronissi, Italy
Neural Networks for Blind Sources Separation of Stromboli Explosion Quakes

11:20 - 11:40 J. Klingeisen and M. Plumbley
King's College London, London, United Kingdom
Towards Musical Instrument Separation Using Multiple-Cause Neural Networks

11:40 - 12:00 S. Mălăroiu, K. Kiviluoto, and E. Oja
Helsinki Univ. of Technology, Neural Networks Research Centre, Finland
ICA Preprocessing for Time Series Prediction

12:00 - 13:30 **Lunch**

13:30 - 14:15 **Session M: Invited talk 3**
Chair: A. Hyvärinen, Finland

Prof. D. Donoho
Stanford University, Stanford, California, USA
Nature vs. Math: Interpreting Independent Component Analysis in Light of Recent Work in Harmonic Analysis

14:15 - 14:25 **Break**

14:25 - 16:35 **Session N: Poster 3**
Coffee and refreshments are served during the session.

B.-U. Köhler and R. Orglmeister
Inst. of Electronics, Berlin Univ. of Tech., Berlin, Germany
A Blind Source Separation Algorithm Using Weighted Time Delays

A. Hyvärinen and R. Karthikesh
Helsinki Univ. of Tech., Neural Networks Res. Centre, Espoo, Finland
Sparse Priors on the Mixing Matrix in Independent Component Analysis

P. Pajunen and M. Girolami
Helsinki Univ. of Tech., Neural Networks Res. Centre, Espoo, Finland
University of Paisley, CIS Dept., Paisley, Scotland
Implementing Decisions in Binary Decision Trees Using Independent Component Analysis

M. Zibulevsky and B. Pearlmutter
Univ. of New Mexico, Dept. of Computer Sci., Albuquerque, NM, USA
Second Order Blind Source Separation by Recursive Splitting of Signal Subspaces

J. Ahn, J. Lee, M. Jang, and D. Lee
Seoul National University College of Medicine, Seoul, Korea
Noninvasive Extraction of Input Function from Carotid Artery in O-15 Water Dynamic Brain Positron Emission Tomography Using Independent Component Analysis

C. Giurcaneanu and I. Tabus
Tampere Univ. of Tech., Signal Processing Lab., Tampere, Finland
On the Sign of Kurtosis

L. Leung and M. Vuskovic
San Diego State University, San Diego, California, USA
One-Shot Batch Blind Separation of Delayed Sources

T. von Hoff, A. Lindgren, and A. Kaelin
Swiss Federal Institute of Technology, Zurich, Switzerland
University of Rhode Island, Kingston, Rhode Island, USA
Step-Size Control in Blind Source Separation

R. Vollgraf, M. Stetter, and K. Obermayer
Dept. of Computer Science, Tech. Univ. of Berlin, Berlin, Germany
Convolutive Decorrelation Procedures for Blind Source Separation

T. Akuzava
Brain Science Institute, RIKEN, Saitama, Japan
Extended Quasi-Newton Method for the ICA

R. Cristescu, J. Joutsensalo, J. Karhunen, and E. Oja
Helsinki Univ. of Tech., Neural Networks Res. Centre, Espoo, Finland
Jyväskylä University, Jyväskylä, Finland
A Complexity Minimization Approach for Estimating Fading Gaussian Channel in CDMA Communications

J. Galy, C. Adnet, E. Chaumette, and G. Gelle
LIRMM, Montpellier, France
Thomson-Csf Airsys, Bagneux, France
Faculte des sciences de Reims, Reims, France
Blind Separation of Non Circular Sources

Y. Blanco, S. Zazo, and J. Principe
ETS Ingenieros Telecomunicacion. UPM, Madrid, Spain
Univerversity of Florida, Gainesville, Florida, USA
Alternative Statistical Gaussianity Measure using the Cumulative Density Function

S. Dodel, M. Herrmann, and T. Geisel
Max-Planck-Institut fur Strömungsforschung, Göttingen, Germany
Comparison of Temporal and Spatial ICA in fMRI Data Analysis

S. Takahashi, Y. Anzai, Y. Kobayashi, T. Aihara, and M. Tsukada
Dept. of Computer Science, Keio Univ., Yokohama, Japan
Dept. of Inform. Communication, Tamagawa Univ., Tokyo, Japan
Blind Separation of Neuronal Activities from Optical Imaging Data

G. Gelle, M. Colas, and C. Serviere
LAM-URCA, Reims, France
LIS-ENSIEG, Saint Martin d'Heres, France
BSS for Fault Detection and Machine Monitoring: Time or Frequency Domain Approach?

S. Senecal and P.-O. Amblard
LIS CNRS UPRESA, Saint Martin d'Heres, France
Bayesian Separation of Discrete Sources via Gibbs Sampling

P. Hoyer and A. Hyvärinen
Helsinki Univ. of Tech., Neural Networks Res. Centre, Espoo, Finland
ICA Features of Colour and Stereo Images

B. Prieto, C. Puntonet, P. Martin-Smith, and A. Prieto
Dto. Arquitectura de Computadores, Univ. of Granada, Spain
Demixing of Linear Mixtures of Unimodal Supergaussian Signals Based on Geometric Properties

S. Douglas
Southern Methodist Univ., Dept. of Electr. Eng., Dallas, Texas, USA
Combined Subspace Tracking, Prewhitening, and Contrast Optimization for Noisy Blind Signal Separation

J. Karvanen, J. Eriksson, and V. Koivunen
Helsinki Univ. of Tech., Signal Processing Lab., Espoo, Finland
Pearson System Based Method for Blind Separation

16:35 - 16:50 **Break**

16:50 - 17:50 **Session O: Natural Image Statistics**
Chair: T.-W. Lee, USA

16:50 - 17.10 A. Hyvärinen, P. Hoyer, and M. Inki
Helsinki Univ. of Technology, Neural Networks Research Centre, Finland
Topographic Independent Component Analysis: Visualizing the Dependence Structure

17:10 - 17:30 K.-Y. Park, M. Jabri, S.-Y. Lee and T. Sejnowski
Brain Science Res. Center and Dept. of Electr. Eng., KAIST, Korea
The University of Sydney, Sydney, Australia
The Salk Institute, San Diego, California, USA
Independent Components of Optical Flows Have MSTd-Like Receptive Fields

17:30 - 17:50 B. Olshausen
Center for Neuroscience, Univ. of California, Davis, CA, USA
Sparse Coding of Time-Varying Natural Images

17:50 - 18:40 **Break**

18:40 - 19:00 **Bus transport to hotel Kalastajatorppa**

19:00 - 22:00 **Banquet at hotel Kalastajatorppa, in Round Hall**
Banquet Speech: Prof S.-I. Amari, RIKEN, Japan
Science and Technology of the 21st Century - Perspectives of Neural Networks and ICA

21:30 , 22:00 **Bus transports back to Hanasaari**

THURSDAY, JUNE 22

9:00 - 10:20 **Session P: Biomedical applications**
Chair: T. Sejnowski, USA

9:00 - 9:20 M. Habl, C. Bauer, C. Ziegaus, E. Lang, and F. Schulmeyer
Institute of Biophysics, University of Regensburg, Germany
University Hospital, Regensburg, Germany
Can ICA Help Identify Brain Tumor Related EEG Signals?

9:20 - 9:40 K. Petersen, L. Hansen, T. Kolenda, E. Rostrup, and S. Strother
Dept. of Math. Modelling, Tech. Univ. of Denmark, Lyngby, Denmark
Hvidovre Hospital, Hvidovre, Denmark
PET Imaging Service, MVAMC, Minneapolis, Minnesota, USA
On the Independent Components of Functional Neuroimages

9:40 - 10:00 A. Cichocki and S. Vorobyov
Brain Science Institute, RIKEN, Wako-shi, Japan
Application of ICA for Automatic Noise and Interference Cancellation in Multisensory Biomedical Signals

10:00 - 10:20 S. Makeig, S. Enghoff, T.-P. Jung, and T. Sejnowski
Naval Health Research Center, San Diego, California, USA
The Salk Institute, San Diego, California, USA
Moving-Window ICA Decomposition of EEG Data Reveals Event-Related Changes in Oscillatory Brain Activity

10:20 - 10:40 **Coffee break**

10:40 - 11:25 **Session R: Invited talk 4**
Chair: E. Oja, Finland

T.-P. Jung, S. Makeig, T.-W. Lee, M. McKeown, G. Brown, A. Bell, and Prof. T. Sejnowski
The Salk Institute, San Diego, California, USA
Independent Component Analysis of Biomedical Signals

11:25 **Official program ends**

12:15 - 14:25 **Excursions (optional):**

either to *Nokia Research Center, Helsinki*
Topic: Future trends in telecommunications
Includes buffet lunch
Bus transport from Hanasaari and back (Max. 50 participants)

or to *Low Temperature Laboratory, Helsinki Univ. of Technology*
Topic: Brain research by MEG
Transport from Hanasaari and back (Max. 20 participants)