

VITA

Erkki Oja (Born March 22, 1948, Helsinki, Finland)

Professor of Computer Science and Engineering, Helsinki University of Technology (TKK),
Dept. of Information and Computer Science

Education: 1972: M.Sc. (Eng.) from TKK; 1977: D.Sc. (Eng) from TKK.

Most Important Academic Positions:

1977-78 Research Associate, Brown University, Providence RI, USA

1979-81 Senior Research Fellow, Academy of Finland

1981-87 Associate Professor in Applied Mathematics, University of Kuopio, Finland

1983-84 Visiting Research Scholar, Tokyo Institute of Technology, Japan

1987-93 Professor of Computer Science, Lappeenranta University of Technology, Finland

1990-91 Visiting Professor, Tokyo Institute of Technology, Japan

1993- Professor, Helsinki University of Technology

2000-05 Director, Finnish Centre of Excellence in Neural Networks Research

2000-05 Academy Professor, Academy of Finland

2006-11 Director, Finnish Centre of Excellence in Adaptive Informatics Research

2007-09 Chairman, Research Council for Natural Sciences and Engineering, the Academy of
Finland

Professional Activities:

- European Neural Network Society (President 2000-05)
- Int. Neural Network Society (Member of the Governing Board 2002-07; Chairman of the Awards Committee 2002-07; College of Fellows member, 2008-)
- Int. Association for Pattern Recognition (Member of the Governing Board, 1987-2000)
- Memberships in Editorial Boards (IEEE Trans. Neural Networks (1990-2001); Neural Computation; Int. J. Pattern Recognition and Artificial Intelligence; Natural Computing.)
- Several Memberships in (International) Organizing/Program/Advisory Committees.
- Evaluated scientific competence of candidates for over 20 Professorships in Finland and USA, France, Germany, Holland, Great Britain, and Sweden.
- Evaluated several candidates in Finland, Europe, and USA for various grants and awards.
- Was general chair/co-chair or program chair/co-chair for 15 international conferences/workshops
- Evaluated Project Proposals abroad for: European Union, National Science Foundation (USA), Several European Research Councils, The Academy of Finland.

Academic Activities Abroad:

- Research Associate, Brown University, Providence, RI, USA (1977-78)
- Visiting Professor, Tokyo Institute of Technology, 1990-1991
- Visiting Professor, Universite Paris I – Pantheon Sorbonne, 2001
- Provided more than 30 plenary, invited, and tutorial presentations in international conferences and a large number of contributed presentations
- Delivered lectures at several universities and research institutes

Non-Academic Activities:

- Member of the Board of Indecon Ltd. (1994-1998) and of Nnets Inc. (2000)
- Member of the Board of Nokia Foundation (1999-2001)
- Vice-Chairman of the Board of A. Kordelin Foundation, 2006 – 2008

Honors

- Int. Association for Pattern Recognition IAPR Founding Fellow, 1994
- Inst. of Electrical and Electronics Engineers IEEE Fellow, 2000
- Int. Neural Network Society INNS Fellow, 2008
- Member of the Finnish Academy of Science and Letters, 1992-
- IAPR Pierre Devijver Award, 2004
- IEEE Computational Intelligence Society Neural Network Pioneer Award, 2006
- Knight of the White Rose of Finland, 2006
- Honorary Doctor of Philosophy, Uppsala University, Sweden, 2008
- Honorary Doctor of Science in Technology, Lappeenranta University of Technology, Finland, 2008

Doctoral Students Supervised

Altogether 35 doctoral students supervised. During 2003-2008, 17 doctoral students.

Active Doctoral Students under my Personal Supervision

More than 10 students under supervision.

Publications:

- 96 published refereed journal articles in a number of journals
- 199 papers in conference proceedings and books; sole author of one text-book and co-author of another one; co-editor of seven books and several journal special issues. More than 5200 citations (in the *ISI Web of Science* database; more than 4900 in *Scopus*; more than 30.000 in *Google Scholar*) by other scholars in refereed journal articles, scientific books, published conference proceedings, and doctoral dissertations.

SELECTED PUBLICATIONS

Textbooks:

Oja, E. (1983): *Subspace Methods of Pattern Recognition*. Res. Studies Press. Letchworth, England. Japanese translation 1984, Chinese translation 1987. **(333 ISI citations)**

Hyvärinen, A., Karhunen, J. and Oja, E. (2001): *Independent Component Analysis*. J. Wiley, New York. Japanese translation 2005, Chinese translation 2007. **(2230 citations)**.

14 Most Cited Papers in the Rank Order of Citations (only those with over 100 citations)

1. **Hyvärinen, A. and Oja, E.** (1997): "A fast fixed-point algorithm for independent component analysis", *Neural Computation*, Vol. 9, pp. 1483-1492, **(962 citations)**.
2. **Hyvärinen, A. and Oja, E.** (2000): "Independent component analysis: algorithms and applications", *Neural Networks*, Vol. 13, pp. 411-430, **(862 citations)**.
3. **Oja, E.** (1982): "A simplified neuron model as a principal component analyzer", *J. Math. Biol.* Vol. 15, pp.267-273, **(636 citations)**.

4. **Oja, E.** (1989): “Neural networks, principal components, and subspaces”, *Int. J. Neural Systems*, Vol. 1, pp. 61-68, (**324 citations**).
5. **Oja, E.** (1992): “Principal components, minor components, and linear neural networks”, *Neural Networks*, Vol. 5, pp. 927-935, (**303 citations**).
6. **Xu, L., Kultanen, P. and Oja, E.** (1990): “A new curve detection method: Randomized Hough transform”, *Pattern Rec. Letters*, Vol. 11, pp.331-338, (**200 citations**).
7. **Xu, L., Krzyzak, A. and Oja, E.** (1993): “Rival penalized competitive learning for clustering analysis, RBF net, and curve detection”, *IEEE Trans. Neural Networks*, Vol. 4, pp.636-649, (**186 citations**).
8. **Kohonen, T., Oja, E., Simula, O., Visa, A. and Kangas, J.** (1996): “Engineering applications of the Self-organizing map”, *Proc. of the IEEE*, Vol. 84, pp.1358-1384, (**184 citations**).
9. **Oja, E. and Karhunen, J.** (1985): “On stochastic approximation of the eigenvectors and eigenvalues of the expectation of a random matrix”, *J. Math. Anal. Appl.*, Vol. 106, pp.69-84 (**159 citations**).
10. **Karhunen, J., Oja, E., Wang, L., Vigario, R. and Joutsensalo, J.** (1997), “A class of neural networks for Independent component analysis”, *IEEE Trans. Neural Networks*, Vol. 8, pp. 486-504, (**150 citations**).
11. **Vigario, R., Särelä, J., Jousmäki, V., Hämmäläinen, M. and Oja, E.** (2000): “Independent component approach to the analysis of EEG and MEG recordings”, *IEEE Trans. Biomed. Engineering*, Vol. 47, pp. 589-593, (**149 citations**).
12. **Xu, L. and Oja, E.** (1993): “Randomized Hough Transform (RHT): basic mechanisms, algorithms, and complexities”, *Comp. Vision, Graphics, and Image Proc.: Image understanding*, Vol. 57, pp. 131-154, (**131 citations**).
13. **Oja, E.** (1997): “The nonlinear PCA learning rule in Independent component analysis”, *Neurocomputing.*, Vol. 17, pp. 25-45, (**106 citations**).
14. **Xu, L., Oja, E., and Suen, C.** (1992): “Modified Hebbian learning for curve and surface fitting”, *Neural Networks*, Vol. 5, pp. 441-457, (**104 citations**).

3 Most Recent Published or Forthcoming Papers:

1. **Vigario, R. and Oja, E.** (2008): “BSS and ICA in neuroinformatics: from current practises to open challenges”, *Reviews in Biomedical Engineering*, Vol. 1, pp. 50-61.
2. **Yuan, Z., Yang, Z. and Oja, E.** (2009): “Projective nonnegative matrix factorization: sparseness, orthogonality, and clustering”, submitted.