

# CURRICULUM VITAE

## Prof. Juha Karhunen

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## 1 Personal Information

**Family name:** Karhunen

**Given names:** Juha Tuomas

**Date of birth:** April 23, 1954

**Place of birth:** Juva, Finland

**Parents:** Tuomas Karhunen and Valma Karhunen (born Nykänen)

**Wife:** Pirkko Paula Tellervo Karhunen (born Annala) from 1979

**Children:** Antti Petteri (born 1982) and Hanna Pauliina (born 1988)

## 2 Education

- Diploma Engineer, Helsinki University of Technology, Department of Technical Physics, Espoo, Finland, January 1980.
- Licenciate of Technology, Helsinki University of Technology, Department of Technical Physics, Espoo, Finland, August 1982.
- Doctor of Technology, Helsinki University of Technology, Department of Technical Physics, Espoo, Finland, September 1984.

## 3 Professional Career

### Major Positions

- Acting Teaching (or Research) Assistant, Helsinki University of Technology, Laboratory of Computer and Information Science, 1976-1979.

- Teaching Assistant, Helsinki University of Technology, Laboratory of Computer and Information Science, 1980-1984.
- Acting Senior Teaching Assistant, Helsinki University of Technology, Laboratory of Computer and Information Science, 1985-1986.
- Acting Assistant Professor, Helsinki University of Technology, Laboratory of Computer and Information Science, 1986-1990.
- Senior Teaching Assistant, Helsinki University of Technology, Laboratory of Computer and Information Science, 1990-1997.
- Senior Research Fellow of Academy of Finland, August 1997 - July 2002.
- Associate Professor of Computer Science, Helsinki University of Technology, Laboratory of Computer and Information Science, January 1999 - December 2003 (off duty January 1999 - July 2002).
- Professor of Computer Science (by invitation), Helsinki University of Technology, Laboratory of Computer and Information Science, January 2004 - . Specialization area: neural networks and signal processing.
- Half-time Professor of Computer Science since February 2005.

### **Minor Positions**

- Course Assistant, Helsinki University of Technology, Laboratory of Computer and Information Science, on several years 1979-.
- Lecturer, Helsinki University of Technology, Laboratory of Computer and Information Science, on several years 1982-.
- Docent in Statistical Signal Analysis, Helsinki University of Technology, Faculty of Information Technology, Espoo, Finland, 1994-.
- Member in various boards and committees in Helsinki University of Technology, Department of Technical Physics, Faculty of Information Technology, and Faculty of Electrical Engineering, 1982-

## **4 Other Professional Activities**

### **Editorial Board Memberships in International Scientific Journals**

- Neurocomputing (Elsevier), 1997-2004.
- Neural Processing Letters (Kluwer), 1999-2003; again 2008-.

## Memberships in Scientific Societies

- IEEE (Institute of Electrical and Electronics Engineers): Student Member 1979-1982, Member 1982-1984, 1991-1998, Senior Member 1998-
- INNS (International Neural Network Society), Member 1994-
- Pattern Recognition Society of Finland, Member 1983-

## Memberships in Program Committees of Conferences etc.

- Int. Conf. on Artificial Neural Networks (ICANN'91), Espoo, Finland, June 1991.
- IEEE 1993 Workshop on Neural Networks in Signal Processing (NNSP'93), Baltimore, Maryland, September 1993.
- Third Int. Conf. on Neural Networks and Their Applications (NEURAP'97), Marseilles, France, March 1997
- Int. Workshop on Independence and Artificial Neural Networks (I&ANN'98), Tenerife, Spain, February 1998.
- Fourth Int. Conf. on Neural Networks and Their Applications (NEURAP'98), Marseilles, France, March 1998.
- The 7th European Symposium on Artificial Neural Networks (ESANN'99), Bruges, Belgium, April 1999.
- The 2nd Int. Workshop on Independent Component Analysis and Blind Source Separation (ICA2000), Espoo, Finland, June 19-22, 2000, Chairman of the Program Committee.
- The 10th European Signal Processing Conference (EUSIPCO 2000), Tampere, Finland, September 5-8, 2000.
- Int. Conf. on Advances in Intelligent Systems: Theory and Application (AISTA'2000), Canberra, Australia, February 2000.
- The 8th European Symposium on Artificial Neural Networks (ESANN'2000), Bruges, Belgium, April 26-28, 2000.
- Int. Conf. on Artificial Neural Networks in Medicine and Biology (ANNIMAB-1), Gothenburg, Sweden, May 13-16, 2000.
- The 9th European Symposium on Artificial Neural Networks (ESANN'2001), Bruges, Belgium, April 2001.
- Int. Work-Conference on Artificial Neural Networks (IWANN01), Granada, Spain, June 13-15, 2000.
- Third Int. Conf. on Independent Component Analysis and Signal Separation (ICA2001), San Diego, California, December 9-13, 2001.
- The 10th European Symposium on Artificial Neural Networks (ESANN'2002), Bruges, Belgium, April 2002.

- 2002 Int. Joint Conf. on Neural Networks (IJCNN2002), Honolulu, Hawaii, USA, May 12-17, 2002.
- 2002 IEEE Int. Symposium on Circuits and Systems (ISCAS2002), Phoenix, Arizona, USA, May 26-29. Chairman of the Blind DSP Track, attending a Program Committee meeting in Phoenix, Arizona, in January 2002.
- The 4th Int. Workshop on Independent Component Analysis and Blind Source Separation (ICA2003), Nara, Japan, April 1-4, 2003.
- The 11th European Symposium on Artificial Neural Networks (ESANN'2003), Bruges, Belgium, April 2003.
- 2003 IEEE Int. Symposium on Circuits and Systems (ISCA32002), Bangkok, Thailand, May 25-28, 2003. Member of the review committee, acting as the Chairman of the Blind DSP Track on behalf of Prof. Rueywen Liu in the Program Committee meeting in London on 14th December, 2002.
- 2003 Int. Joint Conf. on Neural Networks (IJCNN2003), Portland, Oregon, July 20-24, 2003.
- The 12th Turkish Symp. on Artificial Intelligence and Neural Networks (TAINN 2003), Canakkale, Turkey, July 2-4, 2003. Member of the Advisory Board.
- The 12th European Symposium on Artificial Neural Networks (ESANN'2004), Bruges, Belgium, April 2004.
- The 5th Int. Conf. on Independent Component Analysis and Blind Source Separation (ICA2004), Granada, Spain, September 2004.
- The 13th European Symposium on Artificial Neural Networks (ESANN'2005), Bruges, Belgium, April 2005.
- The 6th Int. Conf. on Independent Component Analysis and Blind Source Separation (ICA2006), Charleston, SC, USA, March 2006. A chair in the program committee.
- The 14th European Symposium on Artificial Neural Networks (ESANN'2006), Bruges, Belgium, April 2006.
- The 2006 IEEE Int. Joint Conf. on Neural Networks (IJCNN2006), Vancouver, BC, Canada, July 2006. A part of the 2006 IEEE World Congress on Computational Intelligence.
- The 7th Int. Conf. on Intelligent Data Engineering and Automated Learning (IDEAL2006), Burgos, Spain, September 2006.
- The 1st European Symp. on Time Series Prediction (ESTSP'07), Espoo, Finland, February 2007.
- The 15th European Symposium on Artificial Neural Networks (ESANN2007), Bruges, Belgium, April 2007.
- The 2007 IEEE Int. Joint Conf. on Neural Networks (IJCNN2007), Orlando, Florida, USA, August 2007. Member of the technical committee.
- IEEE 2007 Workshop on Machine Learning in Signal Processing (MLSP2007), Thessaloniki, Greece, August 2007.

- The 7th Int. Conf. on Independent Component Analysis and Blind Source Separation (ICA 2007), London, United Kingdom, September 2007.
- The 8th Int. Conf. on Intelligent Data Engineering and Automated Learning (IDEAL'07), Birmingham, United Kingdom, December 2007.
- The 2nd Int. Workshop on Hybrid Artificial Intelligence Systems (HAIS'07), Salamanca, Spain, November 2007.
- The 16th European Symposium on Artificial Neural Networks (ESANN2008), Bruges, Belgium, April 2008.
- The 2008 IEEE Int. Joint Conf. on Neural Networks (IJCNN2008), Hong Kong, China, June 2008. A part of the 2008 IEEE World Congress on Computational Intelligence (WCCI2008). Member of the technical committee.
- The 9th Int. Conf. on Intelligent Data Engineering and Automated Learning (IDEAL2008), Daejeon, South Korea, November 2008.
- The 2008 IEEE Workshop on Machine Learning in Signal Processing (MLSP2008), Cancun, Mexico, October 2008.
- The 3rd Int. Workshop on Hybrid Artificial Intelligence Systems (HAIS'08), Burgos, Spain, September 2008.
- The 2008 European Signal Processing Conf. (EUSIPCO-2008), Lausanne, Switzerland, August 2008.
- Int. Workshop on Computational Intelligence in Security for Information Systems (CISIS'08), Genoa, Italy, October 2008.
- IEEE Symposium on Computational Intelligence in Data Mining (CIMD 2009), Nashville, Tennessee, USA, April 2009.
- The 4th Int. Workshop on Hybrid Artificial Intelligence Systems (HAIS'09), Salamanca, Spain, June 2009.
- The 2009 Int. Conf. on Independent Component Analysis and Signal Separation (ICA 2009), Paraty, Brazil, March 2009.
- The European Symposium on Artificial Neural Networks - Advances in Computational Intelligence and Learning (ESANN'2009), Bruges, Belgium, April 2009.
- The 2nd Int. Workshop on Computational Intelligence in Security for Information Systems (CISIS'09), Burgos, Spain, September 2009.
- The 2009 IEEE Int. Workshop on Machine Learning for Signal Processing (MLSP 2010), Grenoble, France, September 2009.
- The 10th Int. Conf. on Intelligent Data Engineering and Automated Learning (IDEAL 2009), Burgos, Spain, September 2009.
- The European Symposium on Artificial Neural Networks (ESANN 2010), Bruges, Belgium, April 2010.
- The 5th Int. Conf. on Hybrid Artificial Intelligence Systems (HAIS2010), San Sebastian, Spain, June 2010.

- The 20th IEEE Int. Workshop on Machine Learning for Signal Processing (MLSP 2010), Kittila, Finland, August-September 2010.
- The 9th Int. Conf. on Latent Variable Analysis and Signal Separation (LVA/ICA 2010), Saint-Malo, France, September 2010.
- The 11th Int. Conf. on Intelligent Data Engineering and Automated Learning (IDEAL 2010), Paisley, Scotland, UK, September 2010.
- Int. Conf. on Neural Computation (ICNC 2010), Valencia, Spain, October 2010.
- The 4th Int. Conf. on Computational Intelligence in Security for Information Systems (CISIS'11), Torremolinos, Spain, June 2011.
- The European Symposium on Artificial Neural Networks (ESANN 2011), Bruges, Belgium, April 2011.
- The 6th Int. Conf. on Hybrid Artificial Intelligence Systems (HAIS11), Wroclaw, Poland, May 2011.

### **Reviewer of Scientific Papers**

Reviewer of numerous manuscripts in the following journals:

IEEE Trans. on Signal Processing (formerly Acoustics, Speech, and Signal Processing), IEEE Trans. on Pattern Analysis and Machine Intelligence, IEEE Trans. on Neural Networks, IEEE Trans. on Circuits and Systems, IEEE Trans. on Industrial Electronics, IEEE Trans. on Biomedical Engineering, IEEE Trans. on Information Theory, Signal Processing, Neural Networks, Neural Computation. Neurocomputing, Neural Processing Letters, Int. J. of Neural Systems, Circuits, Systems, and Signal Processing, Scientia Iranica, Acta Scandinavica Polytechnica, IEE Proc. Circuits, Devices, and Systems, Digital Signal Processing.

Reviewer in many international conferences and workshops.

### **Organization of Special Sessions in International Conferences**

- Organizer of two special sessions on blind signal separation together with Profs. C. Jutten and C. Puntonet in the Int. Work-Conference on Artificial Neural Networks (IWANN01), Granada, Spain, June 13-15, 2000.
- Organizer of a special session on advances in independent component analysis together with Prof. E. Oja in the 2002 Int. Joint Conf. on Neural Networks (IJCNN2002), Honolulu, Hawaii, USA, May 12-17, 2002.
- Organizer of a special session on nonlinear independent component analysis and blind signal separation together with Prof. C. Jutten in the 4th Int. Workshop on Independent Component Analysis and Blind Source Separation (ICA2003), Nara, Japan, April 1-4, 2003.

### **Invited Talks/Papers in International Conferences**

- IEEE Int. Conf. on Neural Networks (ICNN'94), Orlando, Florida, USA, June 1994 (in special invited session on nonlinear PCA).

- The 7th Italian Workshop on Neural Nets (WIRN'95), Vietri sul Mare, Salerno, Italy, May 1995 (invited talk given by Prof. Erkki Oja).
- IEEE Int. Conf. on Neural Networks (ICNN'95), Perth, Australia, November 1995 (plenary talk given by Prof. Erkki Oja).
- European Symp. on Artificial Neural Networks (ESANN'96), Bruges, Belgium, April 1996.
- Neural Information Processing Systems (NIPS'96) Postconference Workshop on Blind Signal Processing and Their Applications, Snowmass (Aspen), Colorado, USA, December 1996 (invited talk given by Prof. Erkki Oja).
- IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP'97), Munich, Germany, April 1997.
- Int. Conf. on Artificial Neural Networks (ICANN'97), Lausanne, Switzerland, October 1997 (plenary talk given by Prof. Erkki Oja).
- Int. Conf. on Neural Information Processing (ICONIP'97), Dunedin, New Zealand, November 1997 (plenary talk given by Prof. Erkki Oja).
- Workshop on Bayesian Methods in Neural Networks, Cambridge, UK, December 1997.
- Workshop on Machines That Learn, Snowbird, Utah, April 1998.
- Workshop on Machines That Learn, Snowbird, Utah, April 1999.
- Workshop on Machines That Learn, Snowbird, Utah, April 2000.
- 2001 Int. Joint Conf. on Neural Networks (IJCNN2001), Washington, D.C., July 2001 (in special invited session on information-theoretic learning).
- Workshop on Learning, Snowbird, Utah, April 2002.
- 2002 Int. Joint Conf. on Neural Networks (IJCNN2002), Honolulu, Hawaii, May 2002 (in special invited session on advances in independent component analysis, presented by A. Honkela).
- 4th Int. Workshop on Independent Component Analysis and Blind Source Separation (ICA2003), Nara, Japan, April 1-4, 2003 (in a special session on nonlinear independent component analysis and blind signal separation, presented by Prof. C. Jutten)
- European Summer School on ICA, Berlin, Germany, June 16-17, 2003 (presented by T. Raiko).
- The Learning Workshop, San Juan, Puerto Rico, USA, March 19-22, 2007.

## Other activities

- Opponent of a doctoral disputation (Harri Saarnisaari).
- Custodian of a doctoral disputation (Harri Valpola, Tapani Raiko)
- Referee (reviewer) of several Doctoral Theses (Heikki Riittinen, Jussi Parkkinen, Ari Vepsäläinen, Paavo Alku, Tomas Bäckström).

- Responsible leader of industrial projects with ABB Corporate Research (1994-1995) and Nokia Corp. (1995-1996).
- Invited visitor and evaluator of scientific research at the Artificial Brain Laboratory (Leader: Prof. A. Cichocki) of Frontier Research Program in RIKEN, Wako-Shi, Saitama (Tokyo), Japan, March 2-17, 1996.
- Responsible for guidance of the following Doctoral Theses (either principally or in part): Jyrki Joutsensalo, Liuyue Wang, Aapo Hyvärinen, Petteri Pajunen, Ricardo Vigario, Harri Valpola, Antti Honkela, Alexander Ilin, Tapani Raiko, and Markus Harva (in review process).
- Responsible for guidance of a number of Licentiate and Diploma Theses at Helsinki University of Technology.
- Responsible for guidance of Diploma Theses for Ecole Polytechnique Federale Lausanne (EPFL), Lausanne, Switzerland, and Polytechnic Institute of Bucharest, Romania.
- Responsible leader of the contributor Laboratory of Computer and Information Sciences in the European joint project BLISS, funded by the European Union 2000-2003.
- Participant and leader of a subgroup in the Teletronics I and II programmes funded by the Academy of Finland, in the project “Blind signal separation in communications receivers and antenna array systems” led by Prof. Erkki Oja.
- Invited visitor and speaker in the national graduate school at the University of Regensburg, Regensburg, Germany, in November 2001.
- Member of the Blind DSP subcommittee of the IEEE Circuits and Systems Society, 2002-
- Evaluator of Dr. Juan K. Lin concerning Associate Professor position at the Rutgers University, New Jersey, USA.
- Evaluator of Dr. Fabian J. Theis concerning Chair and Full Professor position in Bioinformatics at UMIT (Univ. for Health Sciences, Medical Informatics and Technology), Hall, Austria.
- Evaluator of a research proposal to the Czech Science Foundation, June 2007.
- Evaluator of a research proposal to the Superior Council of the National Fund for Scientific and Technological Development (FONDECYT), Chile, October 2010.

## 5 Publications

See a separate list of publications.