

## CURRICULUM VITAE

April 2016

NAME: Ilmoniemi, Risto Juhani (born Aug. 1, 1954) TITLE: Ph.D.

ADDRESS: Dept. of Neuroscience and Biomedical Engineering, Aalto University,  
P.O. Box 12200, FI-00076 AALTO, Finland

TEL: +358-50-556 2964 (office and cellular)

FAX: +358-9-4702 3182

EMAIL: risto.ilmoniemi@aalto.fi

POSITION: Head of Department, Dept. of Neuroscience and Biomedical Engineering  
Professor of Applied Physics, Aalto University School of Science

NAME OF MAIN POSITION IN FINNISH:

Teknillisen fysiikan professori, Aalto-yliopiston perustieteiden korkeakoulu

### EDUCATION AND ACADEMIC STATUS

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
Helsinki Univ. of Technology	M.Sc. (honors)	1981	Applied Physics
Helsinki Univ. of Technology	Ph.D.	1985	Solid State Physics

TITLE OF DOCTORAL THESIS: Neuromagnetism: Theory, Techniques, and Measurements

DOCENT: Docent of neurophysics (since 1992), Helsinki University of Technology (TKK)

PROFESSORHIP: Professor in Applied Physics (Biomed. Eng.; since 2006), TKK/Aalto Univ.

### RESEARCH AND PROFESSIONAL EXPERIENCE

Low Temp. Lab., Helsinki Univ. Technology: Res. assist.; Sr. scientist	1978–1985; 1987–1993
Istituto dello Stato Solido, C.N.R., Rome: Visiting grad. student	February–May 1983
Neuromagnetism Laboratory, New York Univ.: Research scientist	1985–1987
BioMag Laboratory, Helsinki Univ. Central Hospital: Consultant	1993–1994
BioMag Laboratory, Head of Laboratory	1994–2003
Nexstim Ltd., Managing Director	Feb. 1, 2003–Nov. 30, 2005
Nexstim Ltd., Chief Scientific Officer	Dec. 1, 2005–
Lab. of Biomedical Eng., Helsinki Univ. Technology, Res. Director	Aug. 1–Dec. 31, 2005 (50%)
Lab. of Biomed. Eng., Helsinki Univ. Technology, Professor (acting)	Jan 1–Aug. 31, 2006
Helsinki Univ. Technology, Prof. of Applied Physics (permanent)	Sept. 1, 2006–
Lab. of Biomed. Eng., TKK, Head of Laboratory	Jan. 1–Dec. 31, 2007
Dept. of Biomed. Eng. and Comput. Science, TKK/Aalto, Head of Dept.	Jan. 1, 2008–July 31, 2011
Academy Professor, Academy of Finland	Jan. 1, 2012–Dec. 31, 2016

### PRIZES AND ACADEMIC RECOGNITION

1. Innovation Prize 1997 of the New Technology Foundation (Turku, Finland) [Uuden Teknologian Säätiön Innovaatiopalkinto 1997] for “Multichannel magnetic brain stimulator” [Monikanavainen magneettinen aivostimulaattori], awarded to Risto Ilmoniemi and his research team, including

Jarmo Ruohonen, Juha Virtanen, Janne Kamppuri, Pekka Kähkönen and Marko Ollikainen. The award for this first prize was worth 15000 FIM, April 14, 1997.

2. First prize in the invention competition organized by the Foundation for Medical Technology, Finland. The winning proposal was “Electromagnetic brain mapping device”. [Terveystekniikan säätiön järjestämän “Idusta Ideaksi ja Ideasta Yritykseksi” ideakilpailun Sarjan II — Idusta Ideaksi 1. palkinto keksinnöstä “Aivokuoren sähkömagneettinen kartoitin”, Tampere, 25.9.1997]. The award was worth 5000 FIM, Sept. 25, 1997.
3. Innosuomi 2004 Prize awarded by the President of Finland, Ms. Tarja Halonen, to Nexstim Ltd., a company founded and led by Risto Ilmoniemi, November 16, 2004.
4. The 2006 European Information Society Technologies (IST) Prize awarded to Nexstim by EuroCASE (with support of the European Commission), March 22, 2006.
5. Member, Finnish Academy of Science and Letters, 2008.
6. Member, Finnish Academy of Technical Sciences, 2008.
7. Fellow of ISFSI (International Society for Functional Source Imaging), 2011.
8. Academy Professor, Academy of Finland, 2012–2016.
9. World Technology Award Finalist in Health & Medicine, The World Technology Network in association with TIME, Fortune, CNN, Science/AAAS, Kurzweil Technologies, and IEEE Spectrum ([www.wtn.net](http://www.wtn.net)), 2013.
10. First Class Medal of the White Rose of Finland, December 6, 2014.
11. Fellow of EAMBES (European Alliance for Medical and Biological Engineering and Science), 2015.

## **PUBLICATIONS**

229 scientific journal publications, 15 articles in books, 78 in conference proceedings, 12 technical reports, 279 scientific abstracts, 16 patents or patent applications, 21 other writings in popular press and elsewhere.

ISI Web of Science: 15956 citations, *h*-index 58; Google Scholar: 23757 citations, *h*-index 73 (April 12, 2017).

Over 90 invited/keynote talks and several plenary lectures, *e.g.*, Plenary lecture “Hybrid magnetoencephalography (MEG) and magnetic resonance imaging (MRI)”, 14th Int. Superconductive Electronics Conf. (Boston, July 7–11, 2013); Plenary lecture “TMS–EEG: Methodology”, 15th Eur. Congress on Clin. Neurophysiology (Brno, Sept. 30–Oct. 3, 2015); Plenary lecture “New technology for electromagnetic measurement and stimulation of the human brain”, Physics Days (Oulu, March 29–31, 2016); Key Note Lecture “TMS–State of the art 2017”, Nordic Congress of Clinical Neurophysiology & Kuopio Epilepsy Symposium 2017 (Kuopio, March 15–17, 2017).

## **LECTURES AND OTHER COURSES**

Anatomy and physiology of the human brain, lecture course in at the Helsinki University of Technology, biannually 1989–2008. [In Finnish, with title “Ihmisaivojen rakenne ja toiminta”]

Magnetoencephalography, lecture course at the Helsinki University of Technology in collaboration with the Helsinki Brain Research Center, fall semester 2002.

The brain and magnetic fields, lecture course at the University of Helsinki, spring 2004. [In Finnish, with title “Aivot ja magneettikentät”]

Electromagnetism, lecture course at the Helsinki University of Technology, 2005–2006.

Functional imaging in medicine, lecture course at the Helsinki University of Technology, 2007–2010.

Introduction to the anatomy and physiology of the human brain (together with prof. Mikko Sams), lecture course at TKK/Aalto Univ., 2008–. [In Finnish, with title “Johdatus ihmisaivojen rakenteeseen ja toimintaan”]

Neurophysics, Aalto University School of Science, 2016–.

Physics, measurements, and data analysis of MEG and EEG, lecture course at Aalto University School of Science, 2016.

### **ORGANIZATION OF CONFERENCES AND COURSES**

Member of Scientific Advisory Board: Human Brain Mapping Conference, Boston 1996, Copenhagen 1997, Montreal 1998, Düsseldorf 1999.

Member of Organizing Committee: 12th Int. Conf. on Biomagnetism, Helsinki, August 2000.

Member of Scientific Program Committee: 12<sup>th</sup> Int. Conf. on Biomagnetism, Helsinki, August 13–17, 2000; 14<sup>th</sup> Int. Conf. on Biomagnetism, Boston, August 2004; 16<sup>th</sup> Int. Conf. on Biomagnetism, Sapporo, August 2008; 17<sup>th</sup> Int. Conf. on Biomagnetism, Dubrovnik, March 28–April 1, 2010; 19<sup>th</sup> Int. Conf. on Biomagnetism, Halifax, Aug. 24–28, 2014.

Course Director: Mind and Brain III: Audition, Language, Communication. International Course, Dubrovnik, Croatia, April 26–May 4, 2003.

Member of the Technical Program Committee: International Workshop on Ubiquitous Healthcare and Supporting Technologies, Ubi-Health’10, Shanghai, May 31–June 2, 2010.

Organizer and Course Director: Summer course on Transcranial Magnetic Stimulation, Espoo, August 4–8, 2008; International summer school and workshop: Coupling to the Dynamics of the Human Brain with TMS–EEG (Science Factory), Helsinki, June 3–8, 2013; 2nd TMS–EEG Summer School: Probing Brain Dynamics (Science Factory), Helsinki, Sept 8–13, 2014. 3rd TMS–EEG Summer School (Science Factory), Helsinki, Sept 7–12, 2015. 4th TMS–EEG Summer School (Science Factory), Espoo, June 6–11, 2016.

Member of Technical Program Committee: 3rd International Workshop on Recent Advances in Medical Informatics (RAMI-2014), Delhi, India, Sept. 24–27, 2014; 4th International Workshop on Recent Advances in Medical Informatics (RAMI-2015), August 10–13, 2015, Aluva, Koch, Kerala, India.

Member of Local Organizing Committee: Meeting of Int. Soc. for Advancement of Clinical Magnetoencephalography, Helsinki, June 23–26, 2015.

Member of Scientific Committee, European Medical and Biological Engineering Conference (EMBEC) and the Nordic-Baltic Conference on Biomedical Engineering and Medical Physics (NBC), Tampere, June 11–15, 2017.

### **OTHER ACADEMIC AND PROFESSIONAL ACTIVITIES**

Member of the Board: Brain Research Society of Finland, 1990–1996.

Member of the Board: Graduate School “Functional Studies in Medicine”, 1995–2003.

Chairman of the Board, Nexstim Ltd., 2000–2003; Member of the Board, 2000–2006.

Member of Editorial Board: Journal of Psychophysiology, 2003–2007.

Member of Specialist Panel “Ymmärtäminen ja inhimillinen vuorovaikutus” [Understanding and Human Interaction], FinnSight 2015, The Academy of Finland and TEKES, 2005–2006.

Member of Commission K (Electromagnetics in Biology and Medicine), Finnish National Committee of International Union of Radio Science (URSI), Jan 21, 2006–.

Member of the Board, Finnish Society for Natural Philosophy, 2009–2012.

Chairman, Finnish Society for Medical Physics and Medical Engineering, 2010–2012; Vice Chairman, 2007–2010; Member of the Board, 2006–

Member of International Advisory Board for Bernstein Focus Neurotechnology, Berlin, 2010–2013.

Member of the Academic Committee, Aalto University, 2010–2013.

Member of Advisory Board, Medtech West, Gothenburg, 2010–.

Member of the Board: Instrumentarium Science Foundation 2010–.

Founding Member, European Society for Cognitive and Affective Neuroscience, 2011–.

Topic Editor, “Manipulative approaches to human brain dynamics”, *Frontiers in Human Neuroscience*, 2013.

Member of Advisory Board for Berlin Bernstein Center for Computational Neuroscience, 2014–.

Member of Finnish National Committee for Medical Physics and Medical Engineering, 2014–.

Member of Advisory Board, University of Eastern Finland, 2014–.

Member of the Board, Neuroscience Center, University of Helsinki, 2014–.

Member of the International Advisory Board, International Conferences on Biomagnetism, 2014–.

Member of Scientific Committee, Institute for Advanced Biomedical Technologies (ITAB), Gabriele D’Annunzio University, Chieti-Pescara, Italy, 2014–.

Member of the Advisory Board, Magnetic Resonance Imaging Research Center, Univ. Turku, 2015–

Member of the Advisory Board, Aalto Ventures Program, 2015–2016.

Member of the Entrepreneurial Education Steering Group, Aalto University, 2016–2017.

Member of Steering Group, Aalto Health Platform Aalto University, 2016–.

Member of Expert Group (“asiantuntijapankki”), Society of Scientists and Parliament Members Tutkas, 2017–.

## **GRANTS**

TEKES n:o 4070/95, Jan. 23, 1995, “Multichannel magnetic stimulator, prototype”, FIM 400 000.

TEKES n:o 4549/95, Dec. 11, 1995, “Multichannel magnetic stimulator, prototype”, FIM 600 000.

TEKES n:o 40016/97, Jan. 17, 1997, “Multichannel magnetic stimulator, prototype”, FIM 1 218 000.

TEKES n:o 40678/98, June 29, 1998, “Computer-controlled magnetic stimulator, prototype”, FIM 700 000 (April 1, 1998–February 28, 1999).

Foundation for Finnish Inventions [Keksintösäätiö] n:o 95110478, Feb. 21, 1995 and June 3, 1997, “Multichannel magnetic stimulator”, FIM 135 000.

Runar Bäckström Foundation, Nov. 23, 1996, “Device for mapping cortical connectivity and reactivity”, FIM 50 000.

Runar Bäckström Foundation, November 29, 1997, “Silent magnetic stimulator”, FIM 50 000.

Instrumentarium Science Foundation, January 17, 1997, “Construction and evaluation of the device for mapping cortical connectivity and reactivity”, FIM 40 000.

Helsinki University Central Hospital, EVO Grant, Project TYH9307, “Mapping of functional connections and reactivity of the brain; clinical use”, FIM 1 500 000 (1999–2001).

The European Community, Contract No BMH4-CT96-0819 (DG XII–SSMA), Joint European project “Objective evaluation of cognitive brain function and dysfunction”, 54 000 ECU, 1996–1998 (Partner).

Centre for International Mobility, June 15, 1998, Fellowship for Vdim Nikulin, FIM 30000, 1999–2000.

The European Commission, DG XII, Grant Contract PSS\*1046, Joint European project “Imaging of language functions in the brain”, 200 000 Euro (for 9 laboratories), 1999–2001 (Coordinator).

The Academy of Finland, Jan. 28, 2001, “Evoked potentials as resonance phenomena in the brain”, DAAD-collaboration, Project 45494, FIM 23800, 1999–2000.

The Academy of Finland, Oct. 20, 1999, “Plasticity of the brain in language functions”, Project 40685, FIM 555000.

The Academy of Finland, Jan. 7, 2000, “New advanced methods for clinical multichannel magneto- and electrocardiographic mapping”, DAAD-collaboration, Project 42244, FIM 114300, 2000.

The Academy of Finland, May 4, 2000, “Anisotropies in brain tissue: magnetic stimulation, EEG, MEG, and diffusion imaging”, Project 29985, FIM 588000, 2000–2003 (Partner in MaDaMe consortium).

The Academy of Finland, Feb. 15, 2001, “Non-invasive source imaging of myocardial ischemia”, DAAD-collaboration, Project 51576, FIM 114300, 2001–2002.

The Academy of Finland, June 2001, *Centre of Excellence of the Academy of Finland 2002–2007* (BioMag Brain Research Unit being part of the consortium “Helsinki Brain Research Center”).

Helsinki University Central Hospital, EVO Grant, “Cortical reactivity and connectivity in psychiatric disorders”, € 168000 (2002–2004).

Centre for International Mobility, Dec. 2001, Fellowship for Anna Nikulin, FIM 60000, 2002–2003.

Centre for International Mobility, July 4, 2002, Fellowship for Dubravko Kicic, € 4,860, 2002–2003.

Instrumentarium Science Foundation, March 3, 2003, “Uusi aivotoimintojen kartoitusmenetelmä magneettistimulaation ja monikanava-EEG:n avulla” [New method for the mapping of brain functions by magnetic stimulation and multichannel EEG], Fellowship for Dubravko Kicic, € 10,000.

Centre for International Mobility, April 25, 2006, Fellowship for Ana Susac, € 3240, 2006.

The Academy of Finland, Sept. 19, 2007, “Theory of measurement and signal analysis for TMS studies”, Project 121176, € 240000, Jan. 1, 2008 – Dec. 31, 2012.

The European Commission, FP7, “Enough Sleep”, € 290,000, Dec 1, 2005 – Nov. 30, 2008.

The European Commission, FP7, “Hybrid MEG-MRI Imaging System (MEGMRI)”, € 4,865,656 to 13 participants, of which € 972,360 to TKK/Aalto Univ. May 1, 2008 – April 30, 2012. Coordinator.

The European Commission, FP7, “Image-based multi-scale physiological planning for ablation cancer treatment (IMPPACT)”, € 352,090. Sept. 1, 2008 – Aug. 31, 2011.

The Academy of Finland, Nov. 20, 2009, “Computerized inversion for spoken languages”, Project 135009, € 270,000, Jan. 1, 2010 – Dec. 31, 2013.

Centre for International Mobility, June 17, 2010, Fellowship for Julio Cesar Hernandez Pavon, € 6000, June 17, 2010.

TEKES, Sept. 9, 2009, “FiDiPro Grant: Enhanced MEGMRI”, 1495/31/09, € 782,000, Jan. 1, 2010 – 31.12.2014.

Runar Bäckström Foundation, 2011, “Multicolor display”, € 15,000.

The Academy of Finland, Sept. 12, 2012, “Measuring, modeling, and modulating the brain”, Decision n:o 256525, € 750000, Jan. 1, 2012 – Dec. 31, 2014.

The Academy of Finland, Sept. 12, 2012, “Measuring, modeling, and modulating the brain”, Decision n:o 283105, € 440000, Jan. 1, 2015 – Dec. 31, 2016.

Centre for International Mobility, 12-month Fellowship for Sergei Tugin, € 14400, 2012.

Centre for International Mobility, May 7, 2013, 6-month Fellowship for Sergei Tugin, € 7200.

The European Commission, Horizon 2020, FET Open, “Breaking the (BREAKBEN)”, € 3,998,793 to 7 participants, of which € 853,078 to Aalto University. Jan. 1, 2016 – Dec. 31, 2018.

## REFEREEING AND EVALUATIONS

**General areas of expertise:** Physics, Applied Mathematics, Electromagnetism, Bioelectromagnetism, Physics of the Brain, Neurophysics, Neuroscience, Neurophysiology, Health Technology, Medical Technology, Neurotechnology, Entrepreneurship, Biomedical Engineering, Signal Analysis, Modeling.

**Specific areas of expertise:** Brain imaging, Magnetic and electric brain stimulation, MEG, EEG, NIRS, MRI, fMRI, TMS, tDCS, navigated brain stimulation, presurgical evaluation, electrical impedance tomography, evoked responses, cognitive neuroscience, noninvasive diagnostics in neurology, physics of the brain, electromagnetism related to neuroimaging, interaction of electromagnetic fields with living tissue, the electromagnetic forward and inverse problems, signal analysis.

## Evaluator of Universities

1. Evaluator of the *Area of Advance Life Science* at Chalmers University of Technology, Gothenburg, Sweden, April 2012.
2. Chair of the Evaluation Panel of Science and Forestry in the *Research Assessment Exercise* of the University of Eastern Finland, 2013.

## Tenure-track committee memberships

1. Member of the Committee. Professorship in *Computational Science (Complex Systems)*, Department of Biomedical Engineering and Computational Science, Aalto University School of Science, 2010–2011. Selected Candidate: Santo Fortunato.
2. Chairman of the Committee. Professorship in *Biomedical Engineering (Medical Imaging)*, Department of Biomedical Engineering and Computational Science, Aalto University School of Science, 2010–2011. Selected Candidate: Lauri Parkkonen.
3. Member of the Committee. Professorship in *Radio Science and Engineering*, Department of Radio Science and Engineering, Aalto University School of Electrical Engineering, 2011–2012. Selected Candidates: Konstantin Simovski and Ville Viikari.
4. Member of the Committee. Professorship in *High-Growth Entrepreneurship*, Department of Management and International Business, Aalto University School of Science, 2011–2013. Selected Candidates: Marina Biniari and Mikko Jääskeläinen.

5. Member of the Committee. Professorship in *Computational Science (Complex Systems)*, Department of Biomedical Engineering and Computational Science, Aalto University School of Science, 2012. Selected Candidate: Jari Saramäki.
6. Chairman of the Committee. Professorship in *Cognitive Science (Affective and Social Neuroscience)*, Department of Biomedical Engineering and Computational Science, Aalto University School of Science, 2012. Selected Candidate: Lauri Nummenmaa.
7. Member of the Committee. Professorship in *Space Science and Technology*, Department of Radio Science and Engineering, Aalto University School of Electrical Engineering, 2012. Selected Candidate: Tuija Pulkkinen.
8. Member of the Committee. Professorship in *Mathematics (Numerics)*, Department of Mathematics and Systems Analysis, Aalto University School of Science, 2013. Selected Candidate: Antti Hannukainen.
9. Member of the Committee. Professorship in *Mathematics*, Department of Mathematics and Systems Analysis, Aalto University School of Science, 2013. Selected Candidate: Kalle Kytölä.
10. Professorship in *Biophysics*, Department of Biomedical Engineering and Computational Science, Aalto University School of Science, 2013. Selected Candidate: Petri Ala-Laurila.
11. Chairman of the Committee. Professorship in *Molecular Biophysics*, Department of Neuroscience and Biomedical Engineering, Aalto University School of Science, 2015. Selected Candidate: Anton Kuzyk.
12. Member of the Committee. Professorships in *Embedded systems in health technology, smart living environment, control engineering, or high-voltage engineering materials*, Department of Electrical Engineering and Automation, Aalto University School of Electrical Engineering, 2014. Selected Candidates: Ilkka Laakso and Simo Särkkä.

#### **Reviewer of applications for professorships or tenure track positions**

Associate professorship, In Residence series, Department of Radiology, University of California, San Francisco, 2000.

Professorship in *Biomedical Engineering*, Department of Biomedical Engineering, Tampere University of Technology, October 27, 2010.

Promotion to Associate Professorship, Thayer School of Engineering, Dartmouth College, January 2014.

Associate Professorship, College of Health Sciences & Technology, Institute of Cognitive Neuroscience, National Central University, Taiwan; May 2016.

#### **Reviewer of applications for adjunct professorships (docents)**

Dr. Jari Karhu, application for adjunct professorship (docentship) in *xx*, Faculty of Technology, University of Kuopio, *xx*.

Dr. Ari Pääkkönen, application for adjunct professorship (docentship) in *Neurophysics*, Faculty of Natural and Environmental Sciences, University of Kuopio, October 10, 2009.

Dr. Tanja Tarvainen, application for adjunct professorship (docentship) in *xx*, Faculty of *xxx*, University of Kuopio, *xxx*, *xx*.

Dr. Jari Viik, application for adjunct professorship (docentship) in *Biomedical Engineering*, University of Tampere, August 3, 2011.

Dr. Minna Silfverhuth, application for adjunct professorship (docentship) in *Biomedical Engineering, especially Analysis of Brain Imaging Data*, Faculty of Technology, University of Oulu, June 28, 2012.

Dr. Justin Schneiderman, application for “oavlönad docent”, Chalmers University of Technology, May 7, 2014.

Dr. Eini Niskanen, application for adjunct professorship (docentship) in *Biomedical Engineering, especially of Brain Imaging*, Faculty of Science and Forestry, University of Eastern Finland, June 5, 2014.

### **Scientific project evaluations**

Review of the ESPRIT project “Adaptive Brain Interfaces” (European Commission, DG XII; project ABI, No. 28193). Ispra, Italy, October 29, 1999 and Helsinki, May 16–17, 2000.

Peer review evaluation of R&D proposals in the field of *Neurosciences* under the program “Quality of Life and Management of Living Resources” of the 5th Framework Program, European Commission, DG XII, Brussels, January 17–20, 2000.

Proposal evaluation in European Commission IST Future and Emerging Technologies FET calls, Brussels, May 22–26, 2000; Helsinki, Sept. 11, 2000; Brussels, May 14–15, 2001; Helsinki, November 2001; Brussels, March 19–22, 2002; Brussels, October 26–29, 2004; Helsinki Nov. 2004.

Review of the European Commission IST project “Insight 2+”. Leuven, Belgium, December 2, 2002.

Evaluation of Academy Research Fellow post application, Academy of Finland, March 14, 2009.

Grant evaluation, Research Council of Canada, January 2010.

Grant evaluation, New Eurasia Foundation, Moscow, October 2010.

Grant evaluations, Instrumentarium Science Foundation, 2010, 2011, 2012, 2013, 2014, 2015, 2016.

Grant evaluation, Neurological Foundation of New Zealand, May 2011.

Evaluation of FET Flagship Preparatory Action proposals, Brussels, January 10–14, 2011.

Evaluation of FET Flagship pilot project “HPB”, Brussels and Helsinki, July 3–August 10, 2012.

Grant evaluation, New Eurasia Foundation, Moscow, November 2013.

Grant evaluation, Slovak Academy of Sciences, 2014.

Grant evaluation, National Science Centre, Poland, March 2016.

### **Scientific referee for these journals**

Applied Magnetic Resonance, Applied Physics Letters, Biological Cybernetics, Biophysical Journal, BMC Neuroscience, Brain Stimulation, Brain Topography, Cerebral Cortex, Clinical Neurophysiology, Electroencephalography and Clinical Neurophysiology, European Journal of Neuroscience, Frontiers Human Neuroscience, Human Brain Mapping, IEEE Transactions on Biomedical Circuits and Systems, IEEE Transactions on Biomedical Engineering, IEEE Transactions on Medical Imaging, IEEE Transactions on Neural Systems and Rehabilitation Engineering, International Journal of Neural Systems, International Journal of Psychophysiology, Inverse Problems, JAMA Psychiatry, Journal of Applied Physics, Journal of Autism and Developmental Disorders, Journal of Clinical Neurophysiology, Journal of Magnetic Resonance, Journal of Neuroscience Methods, Journal of Psychophysiology, Journal of Theoretical Biology, Magnetic Resonance in Medicine, Medical Engineering & Physics, Naturwissenschaften, Neural Networks, Neurobiology of Aging, NeuroImage, Neuropsychobiology, Neuropsychologia, Neuroscience Letters, Physical Review Letters, PNAS, Psychophysiology, Review of Scientific Instruments, Sleep, Stroke,



The Journal of Neuroscience, The Physical Review, The Science of Nature, Transactions on Neural Systems & Rehabilitation Engineering Trends in Neuroscience, Vision Research.

### **Reviewer of Ph.D. theses**

1. Syed Arif Kamal, "Space-time representation in the brain", Department of Physics, University of Karachi, 1989.
2. Petri Paavilainen, "Mismatch negativity: An automatic brain response reflecting the neural mechanisms of auditory sensory memory", Cognitive Brain Research Unit, University of Helsinki, 1996.
3. Kimmo Uutela, "Estimating neural currents from neuromagnetic measurements", Low Temperature Laboratory, Helsinki University of Technology, 2001.
4. Ilkka Taskinen, "Cluster priors in the Bayesian modelling of fMRI data", Center for Mathematical and Computational Modeling, Department of Mathematics and Statistics, University of Jyväskylä, 2001.
5. Veikko Suihko, "Transcranial electrical stimulation method: a stimulator and modelling with a note on EEG", Department of Electrical Engineering, Tampere University of Technology, 2002.
6. Toni Auranen, "Computational methods for Bayesian estimation of neuromagnetic sources", Helsinki University of Technology, 2007.
7. Mario Liehr, "Validierung biomagnetischer Verfahren bei isotroper und anisotroper Volumenleitung in einem Torsophantom", Friedrich-Schiller-Universität Jena, 2008.
8. Paavo Huttunen, "Spontaneous movements of hands in gradients of weak VHF electromagnetic fields", University of Oulu, 2012.
9. Nigel C. Rogasch, "Developing concurrent transcranial magnetic stimulation and electroencephalography to study prefrontal cortex neurophysiology in people with schizophrenia", Monash University, Australia, 2013.
10. Vigneshwaran Subbaraju, "On diagnosis of Autism spectral disorder using fMRI and structural MRI", Nanyang Technological University, Singapore, 2016.
11. Jia Liu, "Data augmentation and Rician noise model in diffusion MRI with applications in human brain", University of Jyväskylä, 2017.

### **Reviewer of Licentiate theses**

Anne-Mari Vitikainen, "Navigoidun transkraniaalisen magneettistimulaatiokartoituksen ja aivokuoren sähköstimulaatiotutkimuksen vastaavuus", Faculty of Science, University of Helsinki, 2011.

### **Opponent or committee member in a scientific dissertation**

1. Fabio Babiloni, "Solving the puzzle of neuro-imaging: From high resolution EEG to multimodal integration with MEG and fMRI techniques", Laboratory of Computational Engineering, Helsinki University of Technology, Sept. 22, 2000.
2. Veikko Suihko, "Transcranial electrical stimulation method: a stimulator and modelling with a note on EEG", Department of Electrical Engineering, Tampere University of Technology, March 21, 2003 (together with Dr. Anthony Barker).
3. Outi Väisänen, "Multichannel EEG methods to improve the spatial resolution of cortical potential distribution and the signal quality of deep brain sources", Department of Biomedical Engineering, Tampere University of Technology, June 13, 2008 (together with Dr. Fabio Babiloni).

4. Ana Susac, “Neurodynamics of face processing”, University of Zagreb, September 4, 2008. Instructor (Supervisor and other Instructor: Prof. Selma Supek).
5. Myriam Pannetier, “Superconducting-magneto-resistive sensor: Reaching the femtotesla at 77 K”, Service de Physique de l’Etat Condensé – CEA Saclay. Jan. 11, 2010.
6. Fredrik Öisjöen, “High-T<sub>c</sub> SQUIDS for biomedical applications: immunoassays, MEG, and ULF-MRI”, Department of Microtechnology and Nanoscience – MC2, Chalmers University of Technology, Dec. 16, 2011.
7. Eini Niskanen, “Human brain mapping using structural and functional magnetic resonance imaging and transcranial magnetic stimulation”, Department of Applied Physics, University of Eastern Finland, Jan. 13, 2012.
8. Jessica Alejandra Guzmán López, “TMS studies exploring the interaction between neuronal systems and networks in man”, Programa Doctorat “Medicina”, University of Barcelona, September 20, 2012.
9. Julio Cesar Hernandez Pavon, “Study of muscle artifacts in EEG signals evoked by transcranial magnetic stimulation”, University of Guanajuato, Leon, Mexico, Feb. 2, 2012. Supervisor (Other Supervisor Dr. Modesto A. Sosa Aquino).
10. Yazdan Shirvany, “Non-invasive EEG functional neuroimaging for localizing epileptic brain activity”, Department of Signals and Systems, Chalmers University of Technology, March 1, 2013.
11. Laure Caruso, “Giant magnetoresistance based sensors for local magnetic detection of neuronal currents”, Université Pierre et Marie Curie, July 21, 2015.
12. Stephan Lau, “Validating MEG and EEG finite element head models using a controlled rabbit experiment of skull defects“, Technical University Ilmenau and The University of Melbourne (Supervisors Jens Haueisen, David Grayden, and Mark Cook), October 22, 2015.
13. Mervi Könönen, “Functional human neuroimaging using clinical tools: Studies of cortical motor areas”, Faculty of Forestry and Natural Sciences University of Eastern Finland (Supervisors Pasi Karjalainen, Ritva Vanninen and Eini Niskanen), January 15, 2016.
14. Qaiser Mahmood, “Unsupervised segmentation of head tissues from multi-modal magnetic resonance images: with application to EEG source localization and stroke detection”, Department of Signals and Systems, Chalmers University of Technology, April 1, 2016.
15. Anne-Mari Vitikainen, “Navigated transcranial magnetic stimulation in preoperative functional mappings for patients with epilepsy”, Faculty of Science, University of Helsinki (Supervisors Sauli Savolainen, Jyrki Mäkelä and Eero Salli), March 19, 2016.

## **TUTORING AND SUPERVISING**

### **Ph.D. theses**

1. Seppo Ahlfors, “Magnetic source imaging of visually evoked and oscillatory electrical activity of the human brain“, Helsinki University of Technology, June 6, 1994. Instructor.
2. Minna Huotilainen, “Magnetoencephalography in the study of cortical auditory processing”, Helsinki University of Technology, February 7, 1997. Instructor.
3. Jarmo Ruohonen, “Transcranial magnetic stimulation: Modelling and new techniques” Helsinki University of Technology, December 4, 1998. Instructor.
4. Juha Virtanen, “EEG combined with MEG and TMS in studies of human brain function”, Helsinki University of Technology, December 11, 1998. Instructor.

5. Heidi Wikström, *PhD thesis*: “Somatosensory evoked magnetic responses in recovering stroke patients and healthy controls”, Department of Medicine, University of Helsinki, December 4, 1999. Instructor.
6. Vadim Nikouline, *PhD thesis*: “Magnetoencephalographic and electroencephalographic studies of spontaneous activity and evoked responses in the sensorimotor system”, University of Helsinki, October 26, 2001. Instructor.
7. Klaus Linkenkaer-Hansen, *PhD thesis*: “Self-Organized criticality and stochastic resonance in the human brain”, Helsinki University of Technology, December 18, 2002. Instructor.
8. Soile Komssi, *PhD thesis*: “Electroencephalographic responses to transcranial magnetic stimulation”, University of Helsinki, November 27, 2004. Instructor.
9. Oguz Tanzer, *PhD thesis*: “Numerical modeling in electro- and magnetoencephalography”, Helsinki University of Technology, March 13, 2006. Supervisor (Instructor: Jukka Nenonen).
10. Juha Koikkalainen *PhD thesis*: “Image databases in medical applications”, Helsinki University of Technology, March 17, 2006. Supervisor (Instructor: Jyrki Lötjönen).
11. Ville Mäkinen *PhD thesis*: “Analysis of the Structure of Time–Frequency Information in Electromagnetic Brain Signals”, Helsinki University of Technology, April 28, 2006. Supervisor (Instructors: Patrick May and Hannu Tiitinen).
12. Antti Korvenoja, *PhD thesis*: “Comparison and integration of MEG and fMRI in the study of somatosensory and motor systems”, University of Helsinki, January 26, 2007. Instructor.
13. Gina Caetano, *PhD thesis*: “Brain mechanisms of audiotactile and audiomotor interactions”, Helsinki University of Technology, December 21, 2007. Supervisor (Instructors: Veikko Jousmäki and Riitta Hari).
14. Jan Kujala, *PhD thesis*: “Study of cortical rhythmic activity and connectivity with magnetoencephalography”, Helsinki University of Technology, April 24, 2008. Supervisor (Instructor: Riitta Salmelin).
15. Ana Susac, *PhD thesis*: “Neurodynamics of face processing”, University of Zagreb, September 4, 2008. Instructor (Supervisor and other Instructor: Prof. Selma Supek).
16. Samu Taulu, *PhD thesis*: “Processing of weak magnetic multichannel signals: the signal space separation method”, Helsinki University of Technology, October 8, 2008. Supervisor (Instructor: Juha Simola).
17. Matti Stenroos, *PhD thesis*: “Boundary element method in spatial characterization of the electrocardiogram”, Helsinki University of Technology, October 25, 2008. Supervisor (Instructor: Jukka Nenonen).
18. Lauri Parkkonen, *PhD thesis*: “Expanding the applicability of magnetoencephalography”, Helsinki University of Technology, June 12, 2009. Supervisor (Instructor: Riitta Hari).
19. Juha Heiskala, *PhD thesis*: “Accurate modelling of tissue properties in diffuse optical imaging of the human brain”, Helsinki University of Technology, September 19, 2009. Supervisor (Instructor: Ilkka Nissilä).
20. Dubravko Kicic, *PhD thesis*: “Probing cortical excitability with transcranial magnetic stimulation”, Helsinki University of Technology, October 13, 2009. Supervisor (Instructor: Vadim V. Nikulin).
21. Linda Henriksson, *PhD thesis*: “Imaging Studies on the Functional Organization and Plasticity of Human Visual Cortex”, Aalto University, February 19, 2010. Supervisor (Instructor: Simo Vanni).
22. Ville Renvall, *PhD thesis*: “Studying functional magnetic resonance imaging with artificial imaging objects”, Aalto University, March 24, 2010. Supervisor (Instructor: Riitta Hari).

23. Simo Monto, *PhD thesis*: “Dynamic Correlations in Ongoing Neuronal Oscillations in Humans – Perspectives on Brain Function and its Disorders”, Aalto University, April 29, 2010. Supervisor (Instructors: Matias Palva ja Juha Voipio).
24. Anu Holm, *PhD thesis*: “Developing Neurophysiological Metrics for the Assessment of Mental Workload and the Functional State of the Brain”, Aalto University, May 12, 2010. Supervisor (Instructor: Kiti Müller; Opponent: Minna Huotilainen).
25. Mia Liljeström, *PhD thesis*: “Imaging Language Function with MEG and fMRI”, Aalto University, May 28, 2010. Supervisor (Instructor: Riitta Salmelin).
26. Johanna Vartiainen, *PhD thesis*: “Multimodal Imaging of Language Perception”, Aalto University, June 4, 2010. Supervisor (Instructor: Riitta Salmelin).
27. Sanna Malinen, *PhD thesis*: “Data-analysis perspectives on naturalistic stimulation in functional magnetic resonance imaging”, Aalto University, June 11, 2010. Supervisor (Instructor: Riitta Hari).
28. Hanna Mäki, *PhD thesis*: “Studying the cortical state with transcranial magnetic stimulation”, Aalto University School of Science, June 29, 2011. Instructor and Supervisor.
29. Jaakko Virtanen, *PhD thesis*: “Monitoring sleep and hypercapnia with near-infrared spectroscopy”, Aalto University School of Science, Sept. 16, 2011. Instructor and Supervisor.
30. Reetta Nylund, *PhD thesis*: “Proteomics analysis of human endothelial cells after short-term exposure to mobile phone radiation”, Aalto University School of Science, November 4, 2011. Supervisor (Instructor: Darius Leszczynski; Opponent: Jukka Juutilainen).
31. Julio César Hernández Pavón, *PhD thesis*: “Study of muscle artifacts in EEG signals evoked by transcranial magnetic stimulation”, University of Guanajuato, February 2, 2012. Instructor and supervisor (Other supervisor: Dr. Modesto A. Sosa Aquino; Co-supervisor: Dr. Teodoro Córdova Fraga).
32. Jaakko Nieminen, *PhD thesis*: “Ultra-low-field MRI: techniques and instrumentation for hybrid MEG-MRI”, Aalto University School of Science, June 8, 2012. Instructor and supervisor.
33. Pantelis Lioumis, *PhD thesis*: “Transcranial magnetic stimulation in assessment of cortical network properties”, Aalto University School of Science, December 3, 2012. Supervisor (Instructors: Jyrki Mäkelä and Dubravko Kicic).
34. Tiina Näsi, *PhD thesis*: “Multimodal applications of functional near-infrared spectroscopy”, Aalto University School of Science, April 12, 2013. Instructor and supervisor.
35. Panu Vesanen, *PhD thesis*: “Combined ultra-low-field MRI and MEG: instrumentation and applications”, Aalto University School of Science, May 24, 2013. Instructor and supervisor.
36. Juhani Dabek, *PhD thesis*: “Method development for ultra-low-field magnetic resonance imaging and magnetoencephalography”, Aalto University School of Science, April 29, 2014. Instructor and supervisor.
37. Jussi Nurminen, *PhD thesis*: “The magnetostatic multipole expansion in biomagnetism: applications and implications”, Aalto University School of Science, June 10, 2014. Supervisor (Instructor: Samu Taulu).
38. Kirsi Palmu, *PhD thesis*: “Event detection in preterm electroencephalography”, Aalto University School of Science, January 30, 2015. Supervisor (Instructor: Sampsa Vanhatalo).
39. Kalle Kotilahti, *PhD thesis*: “Functional near-infrared spectroscopy of the neonatal brain: Instrumentation, methods and experiments”, Aalto University School of Science, February 6, 2015. Supervisor (Instructor: Ilkka Nissilä).
40. Julio César Hernández Pavón, *PhD thesis*: “Transcranial magnetic stimulation and EEG in studies of brain function”, Aalto University School of Science, August 13, 2015. Instructor and supervisor (Other Instructor: Jukka Sarvas; Opponent: Samu Taulu).

41. Petteri Hyvärinen, *PhD thesis*: “Neurophysiologically-based approaches to tinnitus diagnostics and treatment”, Aalto University School of Science, December 16, 2016. Supervisor (Instructor: Antti Aarnisalo; Opponent: Elina Mäki-Torkko).
42. Matti Tillander, *PhD thesis*: “Advanced techniques in magnetic resonance-guided high-intensity focused ultrasound”, Aalto University School of Science, April 28, 2017. Supervisor (Instructor: Heikki Nieminen; Opponent: Cyril Lafon).
43. Johanna Metsomaa, *PhD thesis*: “Data-driven methods for analyzing TMS-evoked EEG responses”, Aalto University School of Science, May 12, 2017. Supervisor (Instructors: Risto Ilmoniemi and Jukka Sarvas; Opponent: Guido Nolte).
44. Mikko Lilja, *PhD thesis*: “Projection and motion estimation methods for computed tomography”, Aalto University School of Science, 2017. Supervisor (Instructor: Petri Kotiluoto; Opponent: TBD).

### **Licentiate theses**

1. Heikki Väänänen, “Analysis of electro- and magnetocardiographic signals“, Helsinki University of Technology, December 7, 2005. Instructor: Juha Montonen. Supervisor: Risto Ilmoniemi.
2. Hanna Mäki, “Studying cortical excitability with transcranial magnetic stimulation and electroencephalography“, Aalto University, Faculty of Information and Natural Sciences, July 2010. Instructor and supervisor.
3. Kirsi Palmu, “Automatic detection of spontaneous activity transients in preterm electroencephalography“, Aalto University School of Science, January 2013. Supervisor (Instructors: Sampsa Vanhatalo and Harri Valpola).
4. Juha Peltonen, “Cardiovascular magnetic resonance imaging: Error sources in phase contrast flow measurements“, Aalto University School of Science, July 15, 2013. Supervisor (Instructor: Outi Sipilä).
5. Eero Ahtola, “Eye tracking based methods for evaluation of infants’ visual processing“, Aalto University School of Science, January 2015. Supervisor (Instructor: Sampsa Vanhatalo).

### **Master’s theses**

1. Matti Hämäläinen, *Diploma thesis*: “Virtajakauman estimointi mitatusta magneettikentästä”, Helsinki University of Technology, September 5, 1983. [In Finnish; English translation: “Estimation of current distribution from measured magnetic field”]
2. Pia Kemppainen, *Diploma thesis*: “KytKentäkenttäteorian neuromagneettisia sovellutuksia”, Helsinki University of Technology, February 8, 1989. [In Finnish; English translation: “Applications of lead field theory in neuromagnetism”]
3. Minna Huotilainen, *Diploma thesis*: “Aivojen aiheuttamien magneetti- ja sähkökenttien mittaaminen kuulovastetutkimuksissa”, Helsinki University of Technology, February 11, 1992. [In Finnish; English translation: “Recording of magnetic and electric fields produced by cerebral activity in auditory evoked studies”]
4. Markus Perko, *Diploma thesis*: “Opetusohjelma aivojen rakenteesta ja toiminnasta“, Helsinki University of Technology, May 25, 1992. [In Finnish; English translation: “Learning program about human brain anatomy and physiology”]
5. Jussi Numminen, *Diploma thesis*: “Miniminormiestimaatti biomagneettisissa tutkimuksissa“, Helsinki University of Technology, August 17, 1992. [In Finnish; English translation: “The minimum-norm estimate in biomagnetic research”]
6. Mauri Miettinen, *Diploma thesis*: “Magneettisia näköherätevastemittauksia“, Helsinki University of Technology, November 30, 1992. [In Finnish; English translation: “Magnetic measurements of visually evoked responses”]

7. Mikko Uusitalo, *Diploma thesis*: “Projektiomenetelmä magnetoenkefalografiassa“, Helsinki University of Technology, October 5, 1993. [In Finnish; English translation: “Projection method in magnetoencephalography”]
8. Jarmo Ruohonen, *Diploma thesis*: “Magnetic stimulation of the human nervous system“, Helsinki University of Technology, October 29, 1993.
9. Ville Mäkinen, *Diploma thesis*: “Methods and measurements for relating MEG responses to human hearing“, Helsinki University of Technology, June 3, 2002. Instructors: Patrick May and Risto Ilmoniemi. Supervisor: Toivo Katila.
10. Christopher Bailey, *Diploma thesis*: “A functional connectivity model applied to the bioelectromagnetic inverse problem“, Helsinki University of Technology, May 26, 2003.
11. Dubravko Kicic, *Master’s thesis*: “Electroencephalographic correlates of changes in cortical excitability as studied using transcranial magnetic stimulation“, Helsinki University of Technology, June 8, 2005. Instructor: Risto Ilmoniemi. Supervisor: Toivo Katila.
12. Daniela Pison, *Final Project*: “Automatic signal processing of magnetocardiogram data with template selection“, Helsinki University of Technology, November 27, 2006. Instructor: Heikki Väänänen; Supervisor: Risto Ilmoniemi.
13. Adrián Álvarez Polegre, *Final Project*: “Reducing artefacts in TMS-evoked EEG“, Helsinki University of Technology, August 30, 2007. Instructor: Hanna Mäki; Supervisor: Risto Ilmoniemi.
14. Jaakko Tölö, *Master’s thesis*: “Motion estimation during magnetic resonance guided focused ultrasound surgery“, Helsinki University of Technology, January 23, 2008. Instructor: Teuvo Vaara; Supervisor: Risto Ilmoniemi.
15. Henri Koskela, *Master’s thesis*: “Digitoivien magneettikuvauskelojen toiminnan analysointi ja kunvalaadun verifiointi“, Helsinki University of Technology, January 25, 2008. Instructor: Marko Pesola; Supervisor: Risto Ilmoniemi.
16. Tuomas Tölli, *Master’s thesis*: “Magneettiresonanssikuvien piirreirrotus ja sen käyttö Alzheimerin taudin tunnistamisessa“, Helsinki University of Technology, January 31, 2008. Instructor: Juha Koikkalainen; Supervisor: Risto Ilmoniemi.
17. Jaakko Nieminen, *Master’s thesis*: “Polarization encoding for magnetic resonance imaging“, Helsinki University of Technology, August 18, 2008. Instructor: Risto Ilmoniemi; Supervisor: Risto Ilmoniemi.
18. Maarit Aro, *Master’s thesis*: “Functional magnetic resonance imaging during natural viewing“, Helsinki University of Technology, September, 2008. Instructors: Sanna Malinen and Riitta Hari; Supervisor: Risto Ilmoniemi.
19. Yrjö Häme, *Master’s thesis*: “Cortex reconstruction from magnetic resonance images“, Helsinki University of Technology, October 24, 2008. Instructor: Mika Pollari; Supervisor: Risto Ilmoniemi.
20. Johanna Metsomaa, *Master’s thesis*: “Locating Electroencephalographic Sources Evoked by Transcranial Magnetic Stimulation“, Helsinki University of Technology, January 10, 2009. Instructor: Aapo Nummenmaa; Supervisor: Risto Ilmoniemi.
21. Liisa Helle, *Master’s thesis*: “Synchronous neural interactions as a biomarker: Experimental evaluation of a clinical MEG data analysis method“, Helsinki University of Technology, April 5, 2009. Instructor: Samu Taulu; Supervisor: Risto Ilmoniemi.
22. Panu Vesanen, *Master’s thesis*: “Compressed Sensing in Parallel Magnetic Resonance Imaging“, Helsinki University of Technology, May 20, 2009. Instructor and Supervisor: Risto Ilmoniemi.
23. Jyri Lautala, *Master’s thesis*: “Transkraniaalisen magneettistimulaation aiheuttamat EEG-vasteet arcuate fasciculus -radalla diffuusiotensori-magneettiresonanssikuvien perusteella

- navigoituna”, University of Helsinki, 2009. Instructors: Anne-Mari Vitikainen and Risto Ilmoniemi; Supervisors: Sauli Savolainen and Juhani Keinänen.
24. Lippo Järviö, *Master's thesis*: “Vanhusten aktiivisuuden muuttumisen havaitseminen Elsi-anturilattian avulla”, Helsinki University of Technology, August 10, 2009. Instructor: Juha Lindström; Supervisor: Risto Ilmoniemi.
  25. Juho Luomahaara, *Master's thesis*: “Field-tolerant SQUID sensors for a hybrid MEG-MRI system”, Helsinki University of Technology, December 15, 2009. Instructor: Juha Hassel; Supervisor: Risto Ilmoniemi.
  26. Anne Sinkkonen, *Master's thesis*: “ECG tester used in testing compliance of medical devices with ECG standards”, Aalto University, April 6, 2010. Instructor: Osku Ilvonen; Supervisors: Pekka Meriläinen and Risto Ilmoniemi.
  27. Reeta Korhonen, *Master's thesis*: “Characterizing and removing strong TMS-induced artifacts from EEG”, Aalto University, April 21, 2010. Instructor: Risto Ilmoniemi; Supervisor: Risto Ilmoniemi.
  28. Atte Lajunen, *Master's thesis*: “Dynaaminen ja MRI-optinen fantomi lähi-infrapunakuvantamiseen”, Aalto University, April 30, 2010. Instructors: Ilkka Nissilä and Kalle Kotilahti; Supervisor: Risto Ilmoniemi.
  29. Joonas Vanninen, *Master's thesis*: “Digital communications between medical imaging modalities and information systems”, Aalto University, May 7, 2010. Instructors: Konstantin Vdovenko and Markku Myllylä; Supervisor: Risto Ilmoniemi.
  30. Hanna Renvall, *Master's thesis*: “Spatial extent of brain activation in fMRI studies: theoretical considerations”, Aalto University, June 2, 2010. Instructors: Lauri Parkkonen and Riitta Hari; Supervisor: Risto Ilmoniemi.
  31. Tuomas Alhonnoro, *Master's thesis*: “Vessel segmentation for ablation treatment planning and simulation”, Aalto University, June 7, 2010. Instructor: Mika Pollari; Supervisor: Risto Ilmoniemi.
  32. Henna Vepsäläinen, *Master's thesis*: “Structural grey matter changes induced by sound environment: a voxel-based morphometry study”, Aalto University School of Science, May 12, 2011. Instructor: Teppo Särkämö (Univ. Helsinki); Supervisor: Risto Ilmoniemi.
  33. Koos Zevenhoven, *Master's thesis*: “Solving transient problems in ultra-low-field MRI”, Aalto University School of Science, May 30, 2011. Instructor: John Clarke (Univ. Berkeley); Supervisor: Risto Ilmoniemi.
  34. Antti Tanner, *Master's thesis*: “Automatic seizure detection using a two-dimensional EEG feature space”, Aalto University School of Science, Sept. 6, 2011. Instructor: Mika Särkelä (General Electric Healthcare Finland); Supervisor: Risto Ilmoniemi.
  35. Reko Kempainen, *Master's thesis*: “ECG parameters in short-term prediction of ventricular arrhythmias”, Aalto University School of Science, May 27, 2012. Instructor: Mikko Kaski (General Electric Healthcare Finland); Supervisor: Risto Ilmoniemi.
  36. Lari Koponen, *Master's thesis*: “Large thin overlapping coils, a novel approach for multichannel transcranial magnetic stimulation”, Aalto University School of Science, May 27, 2013. Instructor: Jaakko O. Nieminen; Supervisor: Risto Ilmoniemi.
  37. Tuomas Mutanen, *Master's thesis*: “Brain state dynamics in transcranial magnetic stimulation—A combined TMS–EEG study”, Aalto University School of Science, August 12, 2013. Instructor: Jaakko O. Nieminen; Supervisor: Risto Ilmoniemi.
  38. Niko Mäkelä, *Master's thesis*: “Functional localization and investigation of cortical speech areas by navigated TMS and EEG”, Aalto University School of Science, August xx, 2013. Instructors: Jukka Sarvas and Pantelis Lioumis; Supervisor: Risto Ilmoniemi.

39. Susanna Vesamo, *Master's thesis*: "Determination of spring constants in atomic force microscopes", Aalto University School of Science, September 16, 2014. Advisor: Virpi Korpelainen; Supervisor: Risto Ilmoniemi.
40. Mikael Eriksson, *Master's thesis*: "Comparison of five methods for deformable, multi-modal image registration in prostate and pelvic area", Aalto University School of Science, December, 2014. Instructors: Matti Tillander; Supervisor: Risto Ilmoniemi.
41. Ville-Valtteri Tiittanen, *Master's thesis*: "Magnetic stimulation using moving permanent magnets", Aalto University School of Science, April 17, 2015. Instructor: Lari Koponen; Supervisor: Risto Ilmoniemi.
42. Antti Mäkinen, *Master's thesis*: "Smart digital control of superconducting quantum interference devices for ultra-low-field magnetic resonance", Aalto University School of Science, November 24, 2015. Instructor: Koos Zevenhoven; Supervisor: Risto Ilmoniemi.
43. Maarit Aro, *Master's thesis*: "Functional magnetic resonance imaging during natural viewing", Aalto University School of Science, April 23, 2016. Instructors: Riitta Hari and Sanna Malinen; Supervisor: Risto Ilmoniemi.
44. Roosa Kallionpää, *Master's thesis*: "Aivojen N400-herätevaste yksilötasolla: sovellusmahdollisuudet tietoisuuden tutkimuksessa", Aalto University School of Electrical Engineering, January 18, 2016. Instructors: Antti Revonsuo and Katja Valli; Supervisor: Risto Ilmoniemi.
45. Mariia Keitaanniemi, *Master's thesis*: "Study of neurovascular coupling via simultaneous magnetoencephalography and high-density diffuse optical tomography", Aalto University School of Science, October 2, 2016. Instructors: Ilkka Nissilä and Kalle Kotilahti; Supervisor: Risto Ilmoniemi.
46. Matleena Kukkonen, *Master's thesis*: "Studying mechanisms of transcranial brain stimulation: a combined TMS-tES study", Aalto University School of Science, October 31, 2016. Instructor: Tuomas Mutanen; Supervisor: Risto Ilmoniemi.
47. Aino Tervo, *Master's thesis*: "Noise optimization of multi-layer insulation in liquid-helium cryostat for brain imaging", Aalto University School of Science, October 10, 2016. Instructor: Koos Zevenhoven; Supervisor: Risto Ilmoniemi.
48. Jusa Reijonen, , *Master's thesis*: "Automatic estimation of infant encephalographic data quality", Aalto University School of Science, April 2017, Instructor: Tommi Makkonen; Supervisor: Risto Ilmoniemi.

### **Bachelor's theses**

1. Kaisu Lankinen, *Bachelor's thesis*: "Matalakenttä-MRI:n turvallisuus", Helsinki University of Technology, December 12, 2007. Instructor (Supervisors: Pertti Vainikainen and Juha Mallat).
2. Panu Vesanen, *Bachelor's thesis*: "Laitteisto magneettiresonanssikuvaukseen matalissa magneettikentissä", Helsinki University of Technology, January 1, 2008. Instructor and Supervisor.
3. Antti Tanner, *Bachelor's thesis*: "Diffuusiotensorikuvantaminen ja toiminnallisesti kytkeytyneiden aivoalueiden väliset anatomiset radat", Helsinki University of Technology, March 16, 2008. Supervisor (Instructor: Riitta Salmelin).
4. Reko Kemppainen, *Bachelor's thesis*: "Monikanavaisen ultramatalan magneettikentän magneettikuvantamisjärjestelmän simulointiohjelma", Helsinki University of Technology, June 6, 2008. Supervisor and Instructor.
5. Jukka Saari, *Bachelor's thesis*: "Magneettistimulaation aiheuttama kaovopotentialin muutos hermosolussa", Helsinki University of Technology, October 6, 2009. Instructor and Supervisor.



6. Tuukka Hiltunen, *Bachelor's thesis*: "Detection of cortical gamma-band activity with magnetoencephalography", Aalto University Faculty of Information and Natural Sciences, May 25, 2010. Supervisor (Instructor: Jan Kujala).
7. Onerva Korhonen, *Bachelor's thesis*: "Menetelmä puheen tuottamisen systeemitason hermostollisten mekanismien kartoittamiseen magnetoenkefalografialla", Aalto University Faculty of Information and Natural Sciences, June 6, 2010. Supervisor (Instructor: Matias wwPalva).
8. Tuomas Mutanen, *Bachelor's thesis*: "Transkraniaalisen magneettistimulaatioalueen vaikutus syntyneisiin lihasartefakteihin", Aalto University Faculty of Information and Natural Sciences, December 9, 2010. Supervisor (Instructor: Hanna Mäki).
9. Tuomas Hirvonen, *Bachelor's thesis*: "Magnetoenkefalografia: suoran ongelman Matlab-toteutus ja -testaus", Aalto University Faculty of Information and Natural Sciences, August 8, 2010. Supervisor (Instructor: Antti Jalava).
10. Niko Mäkelä, *Bachelor's thesis*: "Automatic registration of the navigated transcranial magnetic stimulation mapping results", Aalto University Faculty of Information and Natural Sciences, October 10, 2010. Supervisor (Instructor: Pantelis Lioumis).
11. Aleksi Pradere-Koskiahde, *Bachelor's thesis*: "Aivojen magneettistimulaation käyttö aivoleikkauksia edeltävässä diagnostiikassa", Aalto University School of Electrical Engineering, December, 2014. Instructor (Responsible teacher: Markus Turunen).
12. Anton Hult, *Bachelor's thesis*: "Aivojen magneettistimulaation käyttö epilepsiahoidossa ja -diagnostiikassa", Aalto University School of Electrical Engineering, December, 2014. Instructor (Responsible teacher: Markus Turunen).
13. Pietu Roisko *Bachelor's thesis*: "Liikeaivokuoren edustusalueiden tarkka määrittäminen magneettistimulaation avulla", Aalto University School of Electrical Engineering, April 20, 2015. Instructor (Instructor: Risto Ilmoniemi; Responsible teacher: Markus Turunen).

### Special Assignments

1. Pauliina Mäkkeli: "Pallomaisen mallipään suunnittelu ja rakentaminen yhdistetyn tACS-MEG:n toteutettavuuden testaamiseksi", October 2014. Supervisor (Instructor: Tuomas Mutanen).