

April 13, 2020

PERSONAL INFORMATION

Name Risto Juhani Ilmoniemi
 Researcher unique identifier&ID orcid.org/0000-0002-3340-2618; E-9704-2012
 Nationality Finnish
 Place and date of birth August 1, 1954, Jyväskylä, Finland
 Web site https://people.aalto.fi/index.html#risto_ilmoniemi



Education and degrees

Ph.D., Solid State Physics, (1985), Helsinki Univ. of Technology
 M.Sc., Applied Physics (1981), Helsinki Univ. of Technology
 Title of Docent: Neurophysics, Helsinki University of Technology, 1992

Linguistic skills

Finnish (Mother tongue), English (C2), Swedish (C2), German (B1), French (A2), Italian (A1), Russian (A1)

Other education and training, qualifications and skills

Entrepreneurial experience (Nexstim's founder and CEO); leadership/management training

Current position

Head of Department; Professor of Applied Physics (tenured), Aalto Univ., Sept. 1, 2006–

Previous positions

Academy Professor, Academy of Finland, Jan. 1, 2012–Dec. 31, 2016
 Head of Department, Dept. of Biomed. Eng. and Comput. Science, Aalto Univ., Jan. 1, 2008–July 31, 2011
 Head of Laboratory, Laboratory of Biomedical Engineering, TKK, Jan. 1 – Dec. 31, 2007
 Acting Professor of Applied Physics, Dec. 1, 2005–Aug. 31, 2006.
 CEO, Nexstim Ltd., Feb. 1, 2003–Nov. 30, 2005
 Head of Laboratory, BioMag Laboratory, Helsinki Univ. Central Hospital, 1994–2003
 Senior Scientist, Low Temperature Laboratory, TKK, 1987–1993
 Research Scientist, Neuromagnetism Lab., New York University, Sept. 1, 1985 – Aug. 31, 1987
 Researcher/Assistant, Low Temperature Laboratory, TKK, June 1, 1978–Aug. 1985

Major achievements

- Built the first multichannel SQUID magnetometers for brain mapping (1981, 1983)
- Derived solutions to MEG forward and inverse problems (1981, 1984, 1995)
- Co-invented of the minimum-norm estimate for MEG and EEG (1984, 1994)
- Invented the signal-space projection method (1993)
- Invented and led the development of TMS–EEG and navigated TMS technology (1996–)
- Founded, led, and advised Nexstim Ltd., the Navigated-TMS company, now a listed company (2000–)
- Led the construction of the Aalto MEG–MRI prototype (2006–)
- Invented the idea of overlapping-coil mTMS (patent application 2014)
- Biodesign Finland innovation program (2016–), Chairman and first organizer
- ERC Synergy Grant, 2019–2025, coordinator

Publications and talks

Book: Ilmoniemi and Sarvas, Brain Signals, MIT Press 2019

295 publications (Web of Science), 18 articles in books, over 80 in conference proceedings, 12 technical reports, 16 patents or patent applications, 21 other writings in popular press and elsewhere.

Web of Science: 20416 citations, *h*-index 64; Google Scholar: 34115 citations, *h*=84 (April 13, 2020).

Over 100 invited/keynote talks and several plenary lectures, e.g., Plenary lecture “Hybrid magneto-encephalography (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); Plenary lecture “Stimulating and Measuring the Human Brain”, European Medical and Biological Engineering Conference (Tampere, June 11–15, 2017), Invited talk “The SQUID and its applications in the past 30 years”, 30th International Symposium on Superconductivity, ISS 2017 (Tokyo, Dec. 13–15, 2017).

Academic activities abroad

- Research scientist, Neuromagnetism Lab., New York Univ. (Sept. 1, 1985–Aug. 31, 1987)
- Visiting graduate student, Istituto dello Stato Solido, C.N.R., Rome (3 months, February–May, 1983)
- Visiting scientist, Technische Universität Berlin (2 months, July–September, 2013)
- 90+ invited conference talks abroad; 93 other talks at int. meetings and foreign institutions in 26 countries

Awards, prizes and honours

- 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.
- The 2006 European Information Society Technologies (IST) Prize awarded to Nexstim by Euro-CASE (with support of the European Commission), March 22, 2006.
- Member, Finnish Academy of Science and Letters, 2008–
- Member, Finnish Academy of Technical Sciences, 2008–
- Fellow of International Society for Functional Source Imaging (ISFSI), 2011–
- Fellow of EAMBES (European Alliance for Medical and Biol. Eng. and Science), 2015–
- World Tech. Award Finalist, Health & Medicine, World Technology Network—TIME, Fortune, CNN, Science/AAAS, Kurzweil Technologies, and IEEE Spectrum (www.wtn.net), 2013.
- First Class Medal of the White Rose of Finland, December 6, 2014.

Reviewer

Reviewer for EU FP7 FET Flagship Initiative and FET Open projects; Chair of the Evaluation Panel, Research Assessment Exercise, Univ. Eastern Finland; External Reviewer, Chalmers University, Life Science Area; Evaluation for FORMAS of the Strategic Innovation Program Medtech4Health, Sweden; Peer review evaluation of R&D proposals in Neurosciences under the program “Quality of Life and Management of Living Resources”. Grant reviews for the Kordelin Foundation; The Finnish Foundation for Technology Promotion; Instrumentarium Science Foundation; Swiss National Science Foundation, New Eurasia Foundation, Moscow; National Science Centre, Poland; National Center of Science and Technology, Kazakstan; Research Council of Lithuania; Bulgarian National Science Fund; Research Council of Canada; Fonds de la Recherche Scientifique–FNRS, Belgium; Research Promotion Foundation, Cyprus; French National Research Agency; Research Foundation Flanders (FWO); Fondazione Italiana Sclerosi Multipla; The Swedish Childhood Cancer Fund; Marie Skłodowska-Curie Actions; European Science Foundation

Thesis supervision

Supervisor or instructor of 51 Ph.D. theses and 56 M.Sc. theses.

Doctoral thesis reviewer and opponent

Opponent, 15 defences; reviewer, 10 theses: Univ. Karachi; Friedrich-Schiller-Univ. Jena, Univ. Helsinki, Univ. Jyväskylä, Tampere Univ. Techn., Chalmers Univ., Univ. Eastern Finland, Univ. Pierre et Marie Curie Paris, Univ. Barcelona, Univ. Oulu, Ilmenau Univ. of Technology, Univ. Guanajuato, Univ. Zagreb.

Peer reviewer: Applied Magnetic Resonance, Applied Physics Letters, Biological Cybernetics, Biophysical Journal, BMC Neuroscience, Brain Stimulation, Brain Topography, Cerebral Cortex, Clinical Neurophysiology, Electroencephalography and Clinical Neurophysiology, eLife, 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 Trans. Neural Systems and Rehabilitation Engineering, Int. Journal of Neural Systems, Int. J. 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, Neuroscience Letters, Neuroscience Methods, Physical Review Letters, PNAS, Psychophysiology, Review of Scientific Instruments, Sleep, Stroke, The Journal of Neuroscience, The Physical Review, The Science of Nature, Trans. Neural Systems & Rehab. Eng., Trends in Neurosci., Vision Research.

Other professional activities

- Member of the Advisory Board, Aalto Ventures Program (AVP), 2015–
- Member of Advisory Board for Berlin Bernstein Center for Computational Neuroscience, 2014–
- Member of the Governing Board, Neuroscience Center of the University of Helsinki, 2014–

- Member of Advisory Board, University of Eastern Finland, 2014–
- Member of Scientific Committee, Institute for Advanced Biomedical Technologies, Univ. Chieti, 2014–
- Member of the Aalto Academic Committee, 2010–2013
- Member of the Doctoral Committee, Aalto University School of Science, 2009–2012
- Member of the Neuroscience Advisory Board, Lifeboat Foundation, 2012–
- Chairman (Vice Chairman 2007–10), Finnish Soc. for Med. Physics and Med. Engineering, 2010–2013
- Member of the Board, The Finnish Society for Natural Philosophy, 2010–2013
- Member of the Board, Instrumentarium Science Foundation, 2010–
- Member of Int. Advisory Board, Bernstein Focus Neurotechnology, Berlin, 2010–2013
- Member of Advisory Board, Medtech West, Gothenburg, 2010–
- Head of Graduate School, Graduate School “Functional Studies in Medicine”, 2005–2006
- Member of Editorial Board: Journal of Psychophysiology, 2003–2007
- Founder, Nexstim Ltd., 2000; Chairman of the Board, Nexstim Ltd., 2000–2003
- Member of the Advisory Board, Senseg Ltd., 2010–
- Member of Specialist Panel FinnSight 2015, The Academy of Finland and TEKES, 2005–2006
- Member of Commission K, Finnish Committee of Int. Union of Radio Science (URSI), 2006–2019
- Course Director: Mind and Brain III: Audition, Language, Communication, Croatia, 2003
- Course Director: Summer course on Transcranial Magnetic Stimulation, Espoo, 2008
- Organizer: Science Factory and International Summer School on TMS–EEG, annually 2013–
- Member of the Future and Emerging Technologies Advisory Group FETAG, European Union, 2017–
- Member of Board, Aalto Entrepreneurship Platform, Aalto University, Jan. 1, 2018–Dec. 31, 2020.
- Chairman of the Innovation Working Group, Finnish Centre for Neurosciences, 2018–2019.
- Member of the Board, Aivon Oy, 2018–
- Member of the Scientific Committee of the Swedish Childhood Cancer Fund, Jan. 1, 2019–
- Millenium Technology Prize Fellow, 2019–2020.
- Member or chairman in 16 tenure-track committees at Aalto Univ. (2010–2015); reviewer, tenure track (Univ. California, 2000; Tampere Univ. Tech., 2010. Dartmouth College 2014).

Teaching activities

Anatomy and physiology of the human brain, lecture course at Helsinki Univ. Technology, biannually 1989–2008; Introduction to the anatomy and physiology of the human brain, lecture course at TKK/Aalto, 2009–; Magnetoencephalography, lecture course at the Helsinki Univ. 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; Electromagnetism, lecture course at the Helsinki University of Technology, 2005–2006; Functional imaging in medicine, lecture course at the Helsinki Univ. of Technology, 2007; Tutorial lectures in several conferences and international and national summer and winter schools.

Funding

EU FP7, (1) “Hybrid MEG–MRI Imaging System (MEGMRI)”, € 4,865,656, of which € 972,360 to TKK/Aalto Univ, 2008–2012 (Coordinator); (2) “Image-based multi-scale physiological planning for ablation cancer treatment (IMPPACT)”, € 352,090; 2008–2011 (Aalto PI).

TEKES, (1) “FiDiPro Grant: Enhanced MEGMRI”, 1495/31/09, € 782,000; Jan. 1, 2010–Dec. 31, 2014. Invited expert: Dr. Fa-Hsuan Lin, Harvard University / National Taiwan University (PI); (2) Funding for work within SaIWe, Strategic Center for Science, Technology and Innovation (SHOK), € 119,986, 2010–2011; € 116,252; 2012–2013 (Co-PI).

The Academy of Finland, (1) “Theory of measurement and signal analysis for TMS studies”, Project 121176, € 240,000; 2008–2012 (PI); (2) Computerized inversion for spoken languages”, Project 135009, € 270,000; 2010–2013 (Co-PI), (3) “Measuring, modeling, and modulating the brain”, Funding for Academy Professor, Decisions n:os 255347, 256525 and 283105, € 1894831; 2012–2016 (PI); (4) “Electronic–Robotic Perturb-and-measure Brain Scanner”, € 598,296, 2017–2021 (PI).

Horizon 2020, FET Open, “Breaking the Nonuniqueness Barrier in Electromagnetic Neuroimaging (BREAKBEN)”, € 3,998,793 to 7 participants; € 853,078 to Aalto University; 2016–2018 (Coordinator).

Jane&Aatos Erkko Foundation, “A new era in brain stimulation: development of next-generation EEG/fMRI compatible multi-channel brain stimulation technology”, € 1,085,000; € 642,600 to Aalto 2018–2020 (PI).

The European Commission, ERC Synergy Grant, “Connecting to the Networks of the Human Brain (ConnectToBrain)”, € 9,981,794, of which € 3,998,905 to Aalto University, € 2,996,264 to University of Tübingen, and 2,986,625 to University of Chieti–Pescara. 2019–2025 (Corresponding PI).