

CURRICULUM VITAE

1. Full name and date

- Korhonen Vesa Olavi
- Male
- Date of writing CV: 11.7.2017



2. Date and place of birth, nationality, current residence

- 19.7.1982, Haukipudas, Finland
- Finnish
- Rannantie 284 A, 90830 Haukipudas, Finland

3. Education and degree awarded

- **Doctor of Philosophy, Medicine, University of Oulu Graduate School, 20.12.2017**
Degree Programme: Postgraduate Education, Medicine
Major subject: Radiology
Thesis: *Integrating near-infrared spectroscopy to synchronous multimodal neuroimaging: applications and novel findings*
(<http://urn.fi/urn:isbn:9789526214146>)
- **Master of Science in Technology, University of Oulu, 26.05.2011**
Programme: Information Engineering
Major subject: Signal Processing and Engineering Mathematics
Minor subject: Biomedical Engineering
- **Bachelor of science in Technology, University of Oulu, 03.03.2011**
- **Matriculation Examination, Haukiputaan lukio, 02.06.2001**

4. Other education and training, qualification and skills

- Recent short-term research visits:
2016:
 - *Leibniz Institute for Neurobiology*, Magdeburg, Germany (performing multimodal studies in magnetoencephalography (MEG) environment)2015:
 - *Leibniz Institute for Neurobiology*, Magdeburg, Germany (performing multimodal studies in magnetoencephalography (MEG) environment)
 - *The Hannover Medical School*, Hannover, Germany (performing combined magnetic resonance imaging (MRI)/blood pressure measurements)
 - *Radboud University Medical Center*, Nijmegen, Netherlands (performing studies using BIOPAC Caretaker, transcranial doppler (TCD) and MRI)2014:
 - *Leibniz Institute for Neurobiology*, Magdeburg, Germany (performing multimodal studies in MEG measurements)
 - *Radboud University Medical Center*, Nijmegen, Netherlands (performing MRI/TCD/near-infrared spectroscopy (NIRS)/blood pressure measurements)

5. Linguistic skills

- **Finnish:** mother tongue . **English:** fluent. **Swedish:** good. **German:** satisfactory

6. Current position

- **Research Engineer, Department of Diagnostic Radiology, Oulu University Hospital, Finland, 3.1.2017-**
My main responsibility is performing multimodal imaging and studies related to it. I organize scanning, ensure that everything works and take care of the patients. In addition, I make data preprocessing and analysis, design, develop and test new measurement devices and supervise 1 PhD student.
- **Postdoctoral Researcher, Oulu Functional NeuroImaging Group, Research Unit of Medical Imaging, Physics and Technology, the Faculty of Medicine, University of Oulu, Oulu, Finland**
- **In addition**, active member of Health & Wellness Measurements Research Group, Optoelectronics and Measurement Techniques Unit, University of Oulu

7. Previous work experience

- **Researcher/ PhD student, Department of Diagnostic Radiology, Medical Faculty, University of Oulu, 1.6.2011 – 31.12.2016**
I worked in the Oulu Functional Neuroimaging (OFNI) group in Oulu University Hospital, Finland. My research focused on simultaneous multimodal imaging techniques (near-infrared spectroscopy, NIRS; functional magnetic resonance imaging, fMRI; electroencephalography, EEG; non-invasive blood pressure measurement, NIBP). My responsibilities were especially NIRS/MREG brain data analysis, multimodal imaging and further developing of devices. Our multimodal imaging system consists of NIRS, EEG, NIBP and fMRI with ultrafast MREG imaging sequence which all we can measure simultaneously. Now we can also use simultaneously an anesthesia monitor where we get for example SpO₂, CO₂, ECG and cuff based NIBP signals. To our knowledge, Oulu is the only place in the world where this kind of unique neuroimaging system exists.
- **Research assistant (1.4.2011 - 31.5.2011), Optoelectronics and measurement techniques laboratory, University of Oulu**
- **Master's Thesis worker (1.9.2010 – 26.5.2011), Optoelectronics and measurement techniques laboratory, University of Oulu**
Thesis: *Noninvasive measurement of cerebral blood oxygenation in the MRI environment*
- **Trainee (3.5.2010 - 2.8.2010) Optoelectronics and measurement techniques laboratory, University of Oulu**

8. Research funding, personal grants, supervision

- Glymphatic pulsation in neurodegenerative diseases (Jane and Aatos Erkkö Foundation, 1 200 000 EUR), Principal investigator: Vesa Kiviniemi (30.9.2016 -, 5 years)
Task: Development of a multimodal brain sensor for glymphatic studies
- Tauno Tönning Foundation 2016 4 000 Personal grant
- Oulu University Scholarship Foundation 2015 5 000 Personal grant
- University of Oulu Graduate School 2015 1 500 Travel grant
- MRC OULU DP 2014 salary (3kk) Personal grant
- MRC OULU DP 2015 salary (12kk) Personal grant
- COST-STSM-BM1205-20196 2014 939 Travel grant
- University of Oulu Graduate School 2013 1 000 Travel grant
- Instrumentarium Science Foundation 2012 15 000 Personal grant
- Supervision of students
 - *1 doctoral student:* Heta Helakari, MSc
 - *1 master's thesis student:* Heta Helakari (graduated in 2017)

- *I student doing his advanced studies in Medicine: Tuomas Laitala*

9. Merits in teaching and pedagogical competence

- Assistant in course Virtual measurement environments (5 ECTS) (from 2016)
- Organizer and educator in Finnish Resting state fMRI course in Oulu 2015

10. Other academic merits

- Reviewer in the Journal of Biomedical Optics (from 2015)
- Organizer in annual Oulu Bioimaging Day (from 2015)
- Organizer in first lymphatics MREG meeting in Oulu 2017

11. Scientific and societal impact research

- I have participated in development of several novel medical measurement devices that have been utilised in medical research, in many university hospitals in Finland, Germany and Netherlands.
- 16 peer reviewed publications (+2 submitted)
- 30 conference abstracts
- 10 most important publications

- V. Kiviniemi, X. Wang, **V. Korhonen**, T. Keinänen, T. Tuovinen, J. Autio, P. LeVan, S. Y-F. Zang, J. Hennig and M. Needergaard, “Ultrafast MR encephalography of physiological brain activity – glymphatic pulsation mechanisms?” *Journal of Cerebral Blood Flow & Metabolism*, 2016 Jun; 36(6):1033-45. doi: 10.1177/0271678X15622047
- V. Kiviniemi, **V. Korhonen**, J. Kortelainen, S. Rytty, T. Keinänen (nee Hiltunen), T. Tuovinen, M. Isokangas, E. Sonkajärvi, T. Siniluoto, J. Nikkinen, S. Alahuhta, O. Tervonen, T. Turpeenniemi-Hujanen, T. Myllylä, O. Kuittinen and J. Voipio (2017) “Real time monitoring of human blood brain barrier disruption”, *PLoS ONE* 12(3): e0174072. doi:10.1371/journal.pone.0174072
- T. Myllylä, N. Zacharias, **V. Korhonen**, A. Zienkiewicz, H. Hinrichs, V. Kiviniemi and M. Walter, “Multimodal brain imaging with magnetoencephalography: A method for measuring blood pressure and cardiorespiratory oscillations”, *Scientific Reports* 7, Article number: 172 (2017). doi:10.1038/s41598-017-00293-7
- **V. Korhonen**, T. Hiltunen, T. Myllylä, S. Wang, J. Kantola, J. Nikkinen, Y-F. Zang, P. Levan and V. Kiviniemi, “Synchronous multi-scale neuroimaging environment for critically sampled physiological analysis of brain function – Hepta-scan concept”, *Brain Connectivity*, vol. 4, NO.9, 677-689.
- **V. O. Korhonen**, T. S. Myllylä, M.Yu. Kirillin, A. P. Popov, A. V. Bykov, A.V. Gorshkov, E.A. Sergeeva, M. Kinnunen and V. Kiviniemi,

“Light Propagation in NIR Spectroscopy of the Human Brain” *IEEE Journal of Selected Topics in Quantum Electronics*, vol. 20, NO.2, March/April 2014, 10 pages.

- V. Raatikainen, N. Huotari, **V. Korhonen**, A. Rasila, J. Kananen, L. Raitamaa, T. Keinänen, J. Kantola, O. Tervonen and V. Kiviniemi, “Combined spatiotemporal ICA (stICA) for continuous and dynamic lag structure analysis of MREG data”, *NeuroImage*, vol. 148 (1), March 2017, pages 352-363.
 - T. Myllylä, E. Vihriälä, M. Pedone, **V. Korhonen**, L. Surazynski, M. Wrobel, A. Zienkiewicz, J. Hakala, H. Sorvoja, J. Lauri, T. Fabritius, M. Jedrzejewska-Szczerska, V. Kiviniemi and I. Meglinski “Prototype of an opto-capacitive probe for non-invasive sensing cerebrospinal fluid circulation”, *Proc. SPIE 10063*, Dynamics and Fluctuations in Biomedical Photonics XIV, 100630M (March 3, 2017); doi:10.1117/12.2251977
 - A. Zienkiewicz, N. Huotari, L. Raitamaa, V. Raatikainen, H. Ferdinando, E. Vihriälä, **V. Korhonen**, T. Myllylä and V. Kiviniemi ”Continuous blood pressure recordings simultaneously with functional brain imaging – studies of glymphatic system”, *Proc. SPIE 10063*, Dynamics and Fluctuations in Biomedical Photonics XIV, 1006311 (March 3, 2017); doi:10.1117/12.2252032
 - T. Myllylä, **V. Korhonen**, L. Surazynski, A. Zienkiewicz, H. Sorvoja and R. Myllylä, "Measurement of cerebral blood flow and metabolism using light-emitting diodes”, *Measurement*, vol. 58, December 2014, pp. 387-393. doi: 10.1016/j.measurement.2014.08.027
 - T. Myllylä, **V. Korhonen**, E. Vihriälä, H. Sorvoja, T. Hiltunen, O. Tervonen and V. Kiviniemi., “Human Heart Pulse Wave Responses Measured Simultaneously at Several Sensor Placements by Two MR-Compatible Fibre Optic Methods,” *Journal of Sensors*, vol. 2012, Article ID 769613, 8 pages, 2012. doi:10.1155/2012/769613
- Military service 2001-2002
 - military rank: corporal
 - leadership training