

Elisa Kallioniemi, Ph.D.

Postdoctoral Research Fellow

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Department of Psychiatry
UT Southwestern Medical Center
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EDUCATION

- 2012 – 2016 **Ph.D. in Applied Physics**
University of Eastern Finland, Kuopio, Finland
Thesis: Assessment of Motor Cortical Excitation-Inhibition Balance and Microstructure: Studies Combining Navigated Transcranial Magnetic Stimulation and Magnetic Resonance Imaging, Graduated with Distinction (top 5% of all Ph.D. theses)
- 2004 – 2012 **B.Sc. (Tech.) and M.Sc. (Tech.) in Electronics and Electrical Engineering**
(Biomedical/Bionics option)
Aalto University, Espoo, Finland
- 2010 **Exchange Student in Biomedical Engineering**
La Trobe University, Melbourne, Australia

RESEARCH APPOINTMENTS

- 2018 – now **UT Southwestern Medical Center, Dallas, TX**
Postdoctoral Research Fellow in Electromagnetic Brain Stimulation and Psychiatry
Advisors: Carol Tamminga, M.D., Zafiris Daskalakis, M.D., Ph.D. (U.C. San Diego)
- 2017 – 2018 **Stanford Medicine, Stanford, CA**
Visiting Postdoctoral Researcher in Electromagnetic Brain Stimulation and Psychiatry
Advisors: Nolan Williams, M.D., Keith Sudheimer, Ph.D.
- 2012 – 2016 **University of Eastern Finland and Kuopio University Hospital, Kuopio, Finland**
Doctoral Research in Electromagnetic Brain Stimulation
Advisor: Petro Julkunen, Ph.D.
- 2012 **Aalto University, Espoo, Finland**
Research Assistant in Electromagnetic Brain Stimulation
Advisor: Juha Silvanto, Ph.D.
- 2011 – 2012 **University of Helsinki, Helsinki, Finland**
Research Assistant in Cognitive Science
Advisor: Christina Krause, Ph.D.
- 2008 **Electronics and Telecommunications Research Institute, Daejeon, South Korea**
Trainee in Research, rotating at different research laboratories

(‡ = co-first authors, * = student that I mentored)

- [1.] Kekkonen V, **Kallioniemi E**, Kaarre O, Könönen M, Kivimäki P, Gröhn H, Tolmunen T, Vanninen R. Heavy drinking from adolescence to young adulthood is associated with an altered cerebellum. *Alcohol*, 2021;92:35–40. <https://doi.org/10.1016/j.alcohol.2021.02.002>.
- [2.] Reijonen J*, Pitkänen M*, **Kallioniemi E**, Mohammadi A, Ilmoniemi RJ, Julkunen P. Spatial extent of cortical motor hotspot in navigated transcranial magnetic stimulation. *Journal of Neuroscience Methods*, 2020;346:108893. <https://doi.org/10.1016/j.jneumeth.2020.108893>.
- [3.] Pruitt T, Wang X, Wu A, **Kallioniemi E**, Husain MM, Liu H. Transcranial Photobiomodulation (tPBM) With 1,064-nm Laser to Improve Cerebral Metabolism of the Human Brain In Vivo. *Lasers in Surgery and Medicine*, 2020;52(9):807–813. <https://doi.org/10.1002/lsm.23232>.
- [4.] Sirkka J, Säisänen L, Julkunen P, Könönen M, **Kallioniemi E**, Leinonen V, Danner N. Corticospinal excitability in idiopathic normal pressure hydrocephalus: a transcranial magnetic stimulation study. *Fluids Barriers CNS*, 2020;17(1):6. <https://doi.org/10.1186/s12987-020-0167-0>.
- [5.] Nguyen DTA*, Rissanen SM, Julkunen P, **Kallioniemi E**, Karjalainen PA. Principal Component Regression on Motor Evoked Potential in Single-Pulse Transcranial Magnetic Stimulation. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 2019;27(8):1521–1528. <https://doi.org/10.1109/TNSRE.2019.2923724>.
- [6.] Wang X, Dmochowski JP, Zeng L, **Kallioniemi E**, Husain M, Gonzalez-Lima F, Liu H. Transcranial photobiomodulation with 1064-nm laser modulates brain electroencephalogram rhythms. *Neurophotonics*, 2019;6(2):025013. <https://doi.org/10.1117/1.NPh.6.2.025013>.
- [7.] Määttä S, Säisänen L, **Kallioniemi E**, Lakka TA, Lintu N, Haapala EA, Koskenkorva P, Niskanen E, Ferreri F, Könönen M. Maturation changes the excitability and effective connectivity of the frontal lobe: A developmental TMS-EEG study. *Human Brain Mapping*, 2019;40(8):2320–2335. <https://doi.org/10.1002/hbm.24525>.
- [8.] Weiss Lucas C‡, **Kallioniemi E‡**, Neuschmelting V, Nettekoven C, Pieczewski J, Jonas K, Goldbrunner R, Karhu J, Grefkes C, Julkunen P. Cortical Inhibition of Face and Jaw Muscle Activity and Discomfort Induced by Repetitive and Paired-Pulse TMS During an Overt Object Naming Task. *Brain Topography*. 2019;32(3):418–434. <https://doi.org/10.1007/s10548-019-00698-9>.
- [9.] **Kallioniemi E‡**, Kärkkäinen O‡, Määttä S, Könönen M, Kivimäki P, Kaarre O, Velagapudi V, Kekkonen V, Lehto SM, Laukkanen E, Tolmunen T. Repeated Transcranial Magnetic Stimulation-Induced Motor Evoked Potentials Correlate with the Subject-Specific Serum Metabolic Profile of Creatine. *Journal of Clinical Neurophysiology*, 2019;36(3):229–235. <https://doi.org/10.1097/WNP.0000000000000568>.
- [10.] Säisänen L, Määttä S, Julkunen P, Niskanen E, **Kallioniemi E**, Gröhn H, Kemppainen S, Lakka TA, Lintu N, Eloranta AM, Vanninen R, Makkonen I, Könönen M. Functional and structural asymmetry

in primary motor cortex in Asperger syndrome: a navigated TMS and imaging study. *Brain Topography*, 2019;32(3):504–518. <https://doi.org/10.1007/s10548-019-00704-0>.

[11.] Pitkänen M*, **Kallioniemi E**, Järnefelt G, Karhu J, Julkunen P. Efficient Mapping of the Motor Cortex with Navigated Biphasic Paired-Pulse Transcranial Magnetic Stimulation. *Brain Topography*, 2018;31(6):963–971. <https://doi.org/10.1007/s10548-018-0660-9>.

[12.] Löfberg O, Julkunen P, **Kallioniemi E**, Pääkkönen A, Karhu J. Modulation of motor cortical excitability with auditory stimulation. *Journal of Neurophysiology*, 2018;120(3):920–925. <https://doi.org/10.1152/jn.00186.2017>.

[13.] Julkunen P, Löfberg O, **Kallioniemi E**, Hyppönen J, Kälviäinen R, Mervaala E. Abnormal motor cortical adaptation to external stimulus in Unverricht-Lundborg disease (progressive myoclonus type 1, EPM1). *Journal of Neurophysiology*. 2018;120(2):617–623. <https://doi.org/10.1152/jn.00063.2018>.

[14.] Kaarre O, Äikiä M, **Kallioniemi E**, Könönen M, Kekkonen V, Heikkinen N, Kivimäki P, Tolmunen T, Määttä S, Laukkanen E. Association of the N100 TMS-evoked potential with attentional processes: a motor cortex TMS–EEG study. *Brain and Cognition*, 2018;122:9–16. <https://doi.org/10.1016/j.bandc.2018.01.004>.

[15.] **Kallioniemi E**, Savolainen P, Järnefelt G, Koskenkorva P, Karhu J, Julkunen P. Transcranial magnetic stimulation modulation of corticospinal excitability by targeting cortical I-waves with biphasic paired-pulses. *Brain Stimulation*, 2018;11(2):322–326. <https://doi.org/10.1016/j.brs.2017.10.014>.

[16.] Saari J, **Kallioniemi E**, Tarvainen M, Julkunen P. Oscillatory TMS-EEG-Responses as a Measure of the Cortical Excitability Threshold. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 2018;26(2):383–391. <https://doi.org/10.1109/TNSRE.2017.2779135>.

[17.] Kaarre O, **Kallioniemi E**, Könönen M, Tolmunen T, Kekkonen V, Kivimäki P, Heikkinen N, Ferreri F, Laukkanen E, Määttä S. Heavy alcohol use in adolescence is associated with altered cortical activity: a combined TMS-EEG study. *Addiction Biology*, 2018;23:268–280. <https://doi.org/10.1111/adb.12486>.

[18.] Pitkänen M*, **Kallioniemi E**, Julkunen P, Nazarova M, Nieminen JO, Ilmoniemi RJ. Minimum-Norm Estimation of Motor Representations in Navigated TMS Mappings. *Brain Topography*, 2017;30(6):711–722. <https://doi.org/10.1007/s10548-017-0577-8>.

[19.] Pitkänen M*, **Kallioniemi E**, Julkunen P. Effect of inter-train interval on the induction of repetition suppression of motor-evoked potentials using transcranial magnetic stimulation. *PLoS One*, 2017;12(7):e0181663. <https://doi.org/10.1371/journal.pone.0181663>.

[20.] Määttä S, Könönen M, **Kallioniemi E**, Lakka T, Lintu N, Lindi V, Ferreri F, Ponzio D, Säisänen L. Development of cortical motor circuits between childhood and adulthood: a navigated TMS-HdEEG study. *Human Brain Mapping*, 2017;38(5):2599–2615. <https://doi.org/10.1002/hbm.23545>.

[21.] **Kallioniemi E**, Pitkänen M*, Könönen M, Vanninen R, Julkunen P. Localization of cortical primary motor area of the hand using navigated transcranial magnetic stimulation, BOLD and arterial

spin labeling fMRI. *Journal of Neuroscience Methods*. 2016;273:138–148.
<https://doi.org/10.1016/j.jneumeth.2016.09.002>.

[22.] Julkunen P, Määttä S, Säisänen L, **Kallioniemi E**, Könönen M, Jäkälä P, Vanninen R, Vaalto S. Functional and structural cortical characteristics after restricted focal motor cortical infarction evaluated at chronic stage - Indications from a preliminary study. *Clinical Neurophysiology*. 2016;127(8):2775–2784. <https://doi.org/10.1016/j.clinph.2016.05.013>.

[23.] **Kallioniemi E**, Julkunen P. Alternative stimulation intensities for mapping cortical motor area with navigated TMS. *Brain Topography*, 2016;29(3):395–404. <https://doi.org/10.1007/s10548-016-0470-x>.

[24.] **Kallioniemi E**, Könönen M, Säisänen L, Gröhn H, Julkunen P. Functional neuronal anisotropy assessed with neuronavigated transcranial magnetic stimulation. *Journal of Neuroscience Methods*, 2015;256:82–90. <https://doi.org/10.1016/j.jneumeth.2015.08.028>.

[25.] **Kallioniemi E**, Pääkkönen A, Julkunen P. Repetition suppression in transcranial magnetic stimulation-induced motor-evoked potentials is modulated by cortical inhibition. *Neuroscience*, 2015;310:504–511. <https://doi.org/10.1016/j.neuroscience.2015.09.056>.

[26.] Pitkänen M*, **Kallioniemi E**, Julkunen P. Extent and Location of the Excitatory and Inhibitory Cortical Hand Representation Maps: A Navigated Transcranial Magnetic Stimulation Study. *Brain Topography*, 2015;28(5):657–665. <https://doi.org/10.1007/s10548-015-0442-6>.

[27.] **Kallioniemi E**, Säisänen L, Pitkänen M*, Könönen M, Karhu J, Julkunen P. Input-output characteristics of late corticospinal silent period induced by transcranial magnetic stimulation. *Journal of Clinical Neurophysiology*, 2015;32(4):346–351. <https://doi.org/10.1097/WNP.000000000000177>.

[28.] **Kallioniemi E**, Pitkänen M*, Säisänen L, Julkunen P. Onset latency of motor evoked potentials in motor cortical mapping with neuronavigated transcranial magnetic stimulation. *The Open Neurology Journal*, 2015;9:62–69.
<https://doi.org/10.2174/1874205X01509010062>.

[29.] **Kallioniemi E**, Könönen M, Julkunen P. Repeatability of functional anisotropy in navigated transcranial magnetic stimulation – coil-orientation versus response. *NeuroReport*, 2015;26(9):515–521.
<https://doi.org/10.1097/WNR.0000000000000380>. Cover image.



[30.] **Kallioniemi E**, Säisänen L, Könönen M, Awiszus F, Julkunen P. On the estimation of silent period thresholds in transcranial magnetic stimulation. *Clinical Neurophysiology*, 2014;125(11):2247–2252. <https://doi.org/10.1016/j.clinph.2014.03.012>.

[31.] Julkunen P, **Kallioniemi E**, Könönen M, Säisänen L. Feasibility of automated analysis and inter-examiner variability of cortical silent period induced by transcranial magnetic stimulation. *Journal of Neuroscience Methods*, 2013;217(1-2):75–81. <https://doi.org/10.1016/j.jneumeth.2013.04.019>.

OTHER PEER-REVIEWED PUBLICATIONS

- [1.] **Kallioniemi E**. Cortical excitability measures from TMS-EEG and TMS-EMG - Two sides of the same story? *The Journal of Physiology*, 2021. <https://doi.org/10.1113/JP281523>.
- [2.] **Kallioniemi E**, McClintock SM, Deng Z-D, Husain MM, Lisanby SH. Magnetic Seizure Therapy: Towards Personalized Seizure Therapy for Major Depression. *Personalized Medicine in Psychiatry*, 2019;17-18:37–42. <https://doi.org/10.1016/j.pmip.2019.04.003>.
- [3.] McClintock SM, **Kallioniemi E**, Martin DM, Kim JU, Weisenbach SL, Abbott CC. A critical review and synthesis of clinical and neurocognitive effects of non-invasive neuromodulation antidepressant therapies. *Focus (American Psychiatric Association Publishing)*, 2019;17(1):18–29. <https://doi.org/10.1176/appi.focus.20180031>.

BOOK CHAPTERS

- [1.] Weiner RD, Husain MM, Young JR, **Kallioniemi E**. Electroconvulsive Therapy and Other Forms of Brain Stimulation. In the *American Psychiatric Publishing Textbook of Geriatric Psychiatry*. Sixth Edition, Edited by David C. Steffens, Kristina Zdanys. In press.
- [2.] **Kallioniemi E**, Määttä S. TMS-EEG. In *Kliininen neurofysiologia*, First Edition, Edited by Mervaala E, et al. Published 2019 by Duodecim. Pages: 370–372.
- [3.] **Kallioniemi E**, Könönen M and Määttä S. TMS-EEG, Methods and Challenges in the Analysis of Brain Connectivity. In *Biomedical Engineering Challenges*, Edited by V. Piemonte, A. Basile, T. Ito and L. Marrelli. Published 2018 by Wiley. Pages: 175–197. <https://doi.org/10.1002/9781119296034.ch9>.

SUBMITTED

- [1.] **Kallioniemi E**, Daskalakis ZJ. Identifying novel biomarkers with TMS-EEG – methodological possibilities and challenges.
- [2.] **Kallioniemi E**, Saari J, Ferreri F, Määttä S. TMS-EEG responses across the lifespan: measurement, methods for characterization and identified responses.
- [3.] Heikkinen N, **Kallioniemi E**, Niskanen E, Könönen M, Saavalainen T, Tolmunen T, Laukkanen E, Vanninen R. Global brain volume loss associated with excess alcohol use during the pruning process of adolescence – A comparative methodological study.
- [4.] **Kallioniemi E**, Awiszus F, Pitkänen M, Julkunen P. Fast acquisition of resting motor threshold with a stimulus-response curve – possibility or hazard for transcranial magnetic stimulation applications?
- [5.] Daskalakis ZJ, McClintock SM, Hadas I, **Kallioniemi E**, Zomorodi R, Throop A, Palmer L, Farzan F, Thorpe KE, Tamminga C, Blumberger DM. Confirmatory Efficacy and Safety Trial of Magnetic Seizure Therapy for Depression (CREST – MST): A Protocol for Identification of Novel Biomarkers via Neurophysiology.
- [6.] Leinola H, Honkalampi K, Hänninen T, Lehto SM, **Kallioniemi E**, Mervaala E, Purhonen M, Ruusunen A, Vanninen R, Viinamäki H, Valkonen-Korhonen M. A randomized, double-blind and

sham-controlled bifrontal rTMS study in treatment-resistant depression: Improvement in cognitive functioning both in active and sham treatment groups.

[7.] Julkunen P, Löfberg O, Kariminezha S, Säisänen L, Pitkänen M, **Kallioniemi E**, Karhu J. Repetition suppression may detect and distinguish dynamic and stable states of motor excitability.

[8.] Nguyen DTA, Rissanen SM, Julkunen P, **Kallioniemi E**, Karjalainen PA. Coil Orientation in Transcranial Magnetic Stimulation affects the motor-evoked potential's size with little variation in its waveform.

[9.] Hernandez-Pavon J, Veniero D, Lioumis P, Mutanen T, Metsomaa J, Belardinelli P, Bergmann TO, Casarotto S, Casula E, Daskalakis ZJ, Farzan F, Fecchio M, Julkunen P, **Kallioniemi E**, Miniussi C, Rocchi L, Rogasch NC, Siebner H, Tomasevic L, Thut G, Zrenner C, Ziemann U, Ilmoniemi RJ. Transcranial magnetic stimulation combined with electroencephalography: an overview and guidelines for measurement and data analysis.

[10.] Kaarre O, **Kallioniemi E**, Könönen M, Tolmunen T, Kekkonen V, Kivimäki P, Heikkinen N, Ferreri F, Laukkanen E, Määttä S. Sex differences in the alcohol-related alterations in cortical activity – a combined TMS-EEG study.

AWARDS AND HONORS

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|-------------|--|
| 2020 | Inaugural Rising Star in Engineering in Health, a global competition organized by Columbia University, Department of Biomedical Engineering (20 selected of over 160 applicants) (https://www.bme.columbia.edu/announcing-inaugural-rising-stars-engineering-health) |
| 2020 | American College of Neuropsychopharmacology Travel Award |
| 2020 | Article selected to Editor's Choice Collection for 2020, Human Brain Mapping |
| 2020 | North American Neuromodulation Society Travel Award |
| 2018 | International Federation of Clinical Neurophysiology Travel Award |
| 2017 | European Chapter, International Federation of Clinical Neurophysiology Travel Award |
| 2016 | Graduation with Distinction (top 5% of all Ph.D. theses) |
| 2016 | International Society for Magnetic Resonance in Medicine Educational Stipend |
| 2015 | European Chapter, International Federation of Clinical Neurophysiology Travel Award |
| 2015 | Finnish Neuroradiology Society Young Investigator Award |
| 2013 – 2018 | The Finnish Society of Clinical Neurophysiology Travel Awards (five times) |
| 2013 | Best Poster Award, Second Runner-Up, 5 th International Symposium on Navigated Brain Stimulation in Neurosurgery |
| 2013 | Best Poster Award, International Doctoral Program in Biomedical Engineering and Medical Physics |

FELLOWSHIPS (Role: P.I.)

- | | |
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| 2021 | Oskar Huttunen Foundation Postdoctoral Fellowship, Finland (50 000€) |
| 2020 | Instrumentarium Science Foundation Postdoctoral Fellowship, Finland (60 000€) |
| 2019 | Orion Research Foundation sr Postdoctoral Fellowship, Finland (37 500€) |
| 2018 | Finnish Cultural Foundation Postdoctoral Fellowship, Finland (49 000€) |
| 2016 | Päivikki and Sakari Sohlberg Foundation Postdoctoral Fellowship, Finland (25 000€) |
| 2015 | Finnish Foundation for Technology Promotion Predoctoral Fellowship, Finland (5 000€) |

- 2014 – 2015 Radiological Society of Finland Predoctoral Fellowship, Finland (7 850€)
2013 – 2015 The Finnish Brain Research and Rehabilitation Center Neuron Predoctoral Fellowship, Finland (10 000€)
2014 The Finnish Concordia Fund Predoctoral Fellowship, Finland (4 000€)
2013 – 2014 Paulo Foundation Predoctoral Fellowship, Finland (17 000€)
2013 Kaute Foundation Predoctoral Fellowship, Finland (5 700€)
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INVITED TALKS

- [1.] **Kallioniemi E.** Using electromagnetic brain stimulation to tackle unmet clinical needs in psychiatry. Rising Stars in Engineering in Health workshop, Columbia University, virtual meeting due to COVID-19, December 18, 2020.
- [2.] **Kallioniemi E.** Magnetic seizure therapy – Alternative to Electroconvulsive therapy? Science Talks, Department of Clinical Neurophysiology, Kuopio University Hospital, Kuopio, Finland, December 4, 2018.
- [3.] **Kallioniemi E.** rTMS in Schizophrenia – results from Skiter study. Forensic Psychiatry Clinic of the University of Eastern Finland, Kuopio, Finland, December 20, 2017.
- [4.] **Kallioniemi E.** Motor physiology – Studies including transcranial magnetic stimulation and MRI, Department of Psychiatry and Behavioral Sciences, Stanford Medicine, CA, March 29, 2017.
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PROFESSIONAL ORAL PRESENTATIONS

Symposia

- [1.] Chair and Speaker (Co-chair: Jaakko Nieminen). Symposium title: Advances in Transcranial Magnetic Stimulation session. Talk title: Motor evoked potentials induced by biphasic paired-pulses. European Medical and Biological Engineering and Nordic-Baltic Biomedical Engineering, Tampere, Finland
- [2.] Chair and Speaker (Co-chair: Gang Zheng). Symposium title: Multimodal Imaging session. Talk title: Localizing cortical motor representation: A comparative study between navigated transcranial magnetic stimulation, BOLD contrast and arterial spin labeling fMRI. World Congress on Medical Physics and Biomedical Engineering, Toronto, Canada.

Platform presentations

- [1.] **Kallioniemi E.**, Säisänen L, Gröhn H, Ferreri F, Lakka T, Lintu N, Lindi V, Könönen M, Määttä S. Developmental differences in motor cortex TMS-EEG responses associate with local white matter microstructure. 31st International Congress of Clinical Neurophysiology of the IFCN, Washington DC, 2018.
- [2.] **Kallioniemi E.**, Awiszus F, Pitkänen M, Julkunen P. Influence of intertrial interval on measures of motor cortical excitability, Can the resting motor threshold be calculated with a short intertrial interval?

8th International Symposium on Navigated Brain Stimulation in Neurosurgery and Neuromodulation, Berlin, Germany, 2016.

[3.] **Kallioniemi E**, Könönen M, Vanninen R, Säisänen L, Vaalto S, Julkunen P. Functional and structural anisotropy of the motor cortex in chronic stroke: A TMS-DTI study. Brain Stimulation and Imaging meeting, Geneva, Switzerland, 2016.

[4.] **Kallioniemi E**, Säisänen L, Könönen M, Julkunen P. A novel approach to evaluate corticospinal inhibition using silent period. 5th International Symposium on Navigated Brain Stimulation in Neurosurgery, Berlin, Germany, 2013.

PROFESSIONAL POSTER PRESENTATIONS

(* = student that I mentored)

[1.] **Kallioniemi E**, Hudgens-Haney M, Zomorodi R, Blumberger D, Daskalakis ZJ, Tamminga C. Neurophysiological signature of magnetic seizure therapy (MST) in depression and schizophrenia: A preliminary resting-state electroencephalography study. 59th American College of Neuropsychopharmacology Annual Meeting, virtual meeting due to COVID-19, 2020.

[2.] Nguyen DTA*, Rissanen SM, Julkunen P, **Kallioniemi E**, Karjalainen PA. Motor-evoked potentials in single-pulse transcranial magnetic stimulation: feature variation versus coil rotation. 6th Annual Brain Stimulation and Imaging Meeting, virtual meeting due to COVID-19, 2020.

[3.] Reijonen J*, Pitkänen M*, **Kallioniemi E**, Mohammadi A, Julkunen P. Defining the motor hotspot as a quantified sub-region of the motor map. 7th International Conference on Non-Invasive Brain Stimulation, virtual meeting due to COVID-19, 2020.

[4.] McClintock S, Husain M, Cullum CM, **Kallioniemi E**, Greer T, Lisanby S. Cognitive Control Across the Spectrum of Major Depressive Disorder. 58th American College of Neuropsychopharmacology Annual Meeting, Orlando, FL, 2019.

[5.] Wang X, Dmochowski J, **Kallioniemi E**, Husain M, Gonzalez-Lima F, Liu H. Transcranial Infrared Brain Stimulation increases power of brain oscillations and connectivity. 5th BRAIN Investigators meeting, Washington DC, 2019.

[6.] Nurmikko T, Sacco P, Bresnahan R, **Kallioniemi E**, Fallon N. Enhanced functional connectivity within primary motor cortex correlates with pain relief induced by repetitive transcranial magnetic stimulation (rTMS). International Neuromodulation Society's 14th World Congress, Sydney, Australia, 2019.

[7.] George-Jones N*, **Kallioniemi E**, Mueller M, McClintock S, Husain M. Can Machine Learning Predict Electroconvulsive Therapy Efficacy in Older Adults? American Geriatrics Society Annual Scientific Meeting, Portland, OR, 2019.

[8.] **Kallioniemi E**, Pruitt T, Wang X, Husain MM, Liu H. Effects of Transcranial Infrared Stimulation on Neural Information Flow in Healthy Volunteers. 57th American College of Neuropsychopharmacology Annual Meeting, Hollywood, FL, 2018.

- [9.] **Kallioniemi E**, Määttä S, Könönen M, Mervaala E, Viinamäki H, Valkonen-Korhonen M. Effects of repetitive transcranial magnetic stimulation on short-latency afferent inhibition: A study in treatment-resistant depression. 31st International Congress of Clinical Neurophysiology of the IFCN, Washington DC, 2018.
- [10.] Pannu J, **Kallioniemi E**, Gulser M, Stimpson K, DeSouza D, Sudheimer K, Williams N. High-Dose Theta-Burst Transcranial Magnetic Stimulation Modulates Heart Rate Variability. 73rd Society of Biological Psychiatry Annual Meeting, New York, NY, 2018.
- [11.] Kaarre O, **Kallioniemi E**, Könönen M, Tolmunen T, Kekkonen V, Kivimäki P, Heikkinen N, Ferreri F, Laukkanen E, Määttä S. Gender differences in the alcohol-related alterations in cortical activity—a combined TMS-EEG study. 30th European College of Neuropsychopharmacology Annual Meeting, Paris, France, 2017.
- [12.] **Kallioniemi E**, Määttä S, Könönen M, Julkunen P, Mervaala E, Kaarre O, Laukkanen E, Tiihonen J, Tuppurainen H. Abnormal response to a high frequency TMS partly restores to a healthy level after rTMS treatment in Schizophrenic patients. 2nd International Brain Stimulation Conference, Barcelona, Spain, 2017.
- [13.] **Kallioniemi E**, Määttä S, Könönen M, Julkunen P, Säisänen L, Mervaala E, Kaarre O, Laukkanen E, Tiihonen J, Tuppurainen H. Repetition suppression in transcranial magnetic stimulation induced motor evoked potentials is impaired in schizophrenic patients. 2nd International Brain Stimulation Conference, Barcelona, Spain, 2017.
- [14.] **Kallioniemi E**, Kärkkäinen O, Määttä S, Könönen M, Kivimäki P, Kaarre O, Kekkonen V, Laukkanen E, Tolmunen T. Serum metabolic profile of creatine correlates with repeated motor evoked potentials: A study on TMS-induced repetition suppression. The 16th European Congress of Clinical Neurophysiology, Budapest, Hungary, 2017.
- [15.] Säisänen L, Hyppönen J, **Kallioniemi E**, Mervaala E, Hallikainen-Pirskanen E, Huttunen Jukka, Fraunberg M. RTMS therapy on M1 modifies the facial motor map in chronic neuropathic pain. The 16th European Congress of Clinical Neurophysiology, Budapest, Hungary, 2017.
- [16.] Julkunen P, Löfberg O, **Kallioniemi E**, Kälviäinen R, Mervaala E. Motor cortical adaptation to external stimuli is altered in Unverricht-Lundborg type myoclonus epilepsy. The 16th European Congress of Clinical Neurophysiology, Budapest, Hungary, 2017.
- [17.] Säisänen L, Hyppönen J, **Kallioniemi E**, Huttunen J, Fraunberg M, Mervaala E. Local cortical excitability in chronic neuropathic facial pain before and after rTMS treatment. Nordic Congress of Clinical Neurophysiology & Kuopio Epilepsy Symposium, Kuopio, Finland, 2017.
- [18.] **Kallioniemi E**, Könönen M, Mervaala E, Viinamäki H, Valkonen-Korhonen M. Effects of repetitive transcranial magnetic stimulation on short-latency afferent inhibition: a study in treatment-resistant depression. Nordic Congress of Clinical Neurophysiology & Kuopio Epilepsy Symposium, Kuopio, Finland, 2017.
- [19.] **Kallioniemi E**, Palmgren JE, Fraunberg M, Könönen M, Vanninen R, Julkunen P. Application of navigated TMS and DTI in pre-radiotherapy planning and the effect of radiation on motor function: A

pilot study with two patients. 8th International Symposium on Navigated Brain Stimulation in Neurosurgery and Neuromodulation, Berlin, Germany, 2016.

[20.] **Kallioniemi E**, Könönen M, Hakumäki J, Mervaala E, Viinamäki H, Vanninen R, Valkonen-Korhonen M. Increase of grey matter following bifrontal rTMS in drug resistant major depressive disorder patients: A VBM study. 24th International Society for Magnetic Resonance in Medicine Annual Meeting, Singapore, 2016.

[21.] Säisänen L, Hyppönen J, **Kallioniemi E**, Mervaala E, Huttunen J, Fraunberg M. rTMS therapy on M1 modifies the motor map in chronic neuropathic facial pain – a pilot study. XXIInd Congress of the European Society for Stereotactic and Functional Neurosurgery, Madrid, Spain, 2016.

[22.] Säisänen L, Hyppönen J, Hallikainen-Pirskanen E, **Kallioniemi E**, Huttunen J, Mervaala E, Fraunberg M. rTMS therapy on M1 modifies motor map in chronic neuropathic facial pain – a pilot study. 6th International Conference on Transcranial Brain Stimulation, Göttingen, Germany, 2016.

[23.] Palmgren Jan-Erik, **Kallioniemi E**, Julkunen P. Use of transcranial magnetic stimulation and diffusion tensor imaging to avoid motor cortex complications in robotic stereotactic radiotherapy planning. American Society for Radiation Oncology 58th Annual Meeting, Boston, MA, 2016.

[24.] Weiss Lucas C, **Kallioniemi E**, Neuschmelting V, Nettekoven C, Reck N, Goldbrunner R, Karhu J, Grefkes C, Julkunen P. Inhibitory online rTMS effects as revealed by cortical silent periods in facial muscles suggest polysynaptic inhibition of speech network. Deutsche Gesellschaft für Klinische Neurophysiologie und Funktionelle Bildgebung, Düsseldorf, Germany, 2016.

[25.] Weiss Lucas C, **Kallioniemi E**, Neuschmelting V, Nettekoven C, Reck N, Goldbrunner R, Karhu J, Grefkes C, Julkunen P. Characteristics and distribution of cortical silent periods elicited by high-frequency online rTMS in facial and jaw muscles during a speech task: evidence for polysynaptic TMS-effects on the speech network. 7th International Symposium on Navigated Brain Stimulation in Neurosurgery, Berlin, Germany, 2015.

[26.] Julkunen P, **Kallioniemi E**. Different options for stimulation intensity in mapping cortical motor area in navigated TMS. World Congress on Medical Physics and Biomedical Engineering, Toronto, Canada, 2015.

[27.] Julkunen P, Pitkänen M, **Kallioniemi E**. Non-invasive estimation of motor cortical functional anisotropy and muscle representation with neuronavigated transcranial magnetic stimulation. The 10th International Conference on Bioelectromagnetism, Tallinn, Estonia, 2015.

[28.] **Kallioniemi E**, Julkunen P. Repetition suppression in resting motor evoked potentials evidenced by an increase in intracortical inhibition. The 15th European Congress on Clinical Neurophysiology, Brno, Czech Republic, 2015.

[29.] Julkunen P, Säisänen L, Määttä S, Könönen M, **Kallioniemi E**, Vanninen R, Jäkälä P, Vaalto S. Cortical recovery from primary motor cortex infarction evaluated at chronic stage. The 15th European Congress on Clinical Neurophysiology, Brno, Czech Republic, 2015.

- [30.] **Kallioniemi E**, Könönen M, Säisänen L, Julkunen P, Vanninen R, Jäkälä P, Määttä S, Vaalto S. Influence of M1 hand knob ischemic stroke on motor activation: An fMRI study in chronic stage. The 15th European Congress on Clinical Neurophysiology, Brno, Czech Republic, 2015.
- [31.] **Kallioniemi E**, Säisänen L, Julkunen P, Könönen M, Vanninen R, Jäkälä P, Määttä S, Vaalto S. Focal lesion on the hand knob re-localizes motor function laterally compared to the unaffected hemisphere. The 15th European Congress on Clinical Neurophysiology, Brno, Czech Republic, 2015.
- [32.] **Kallioniemi E**, Könönen M, Säisänen L, Gröhn H, Julkunen P. Interaction of neuronal anisotropy and motor cortex excitability: a navigated TMS-DTI study. 30th International Congress on Clinical Neurophysiology of the IFCN, Berlin, Germany, 2014.
- [33.] **Kallioniemi E**, Könönen M, Säisänen L, Gröhn H, Julkunen P. Cortical excitability and neuronal anisotropy are related: TMS-DTI study. Organization for Human Brain Mapping Annual Meeting, Hamburg, Germany, 2014.
- [34.] **Kallioniemi E**, Säisänen L, Könönen M, Julkunen P. Individual silent period thresholds improve the sensitivity of cortical inhibition measurement. Asian and Oceanian Congress of Clinical Neurophysiology, Bali, Indonesia, 2013.
- [35.] **Kallioniemi E**, Könönen M, Julkunen P. Degree of neuronal organization in motor cortex evaluated by navigated TMS. Organization for Human Brain Mapping Annual Meeting, Seattle, WA, 2013.
- [36.] **Kallioniemi E**, Säisänen L, Könönen M, Karhu J, Julkunen P. Appearance of late cortical silent period is dependent on stimulation intensity. 5th International Conference on Non-invasive Brain Stimulation, Leipzig, Germany, 2013.
- [37.] Julkunen P, **Kallioniemi E**, Säisänen L, Könönen M. Reliability of an automated protocol versus manual interpreters in analysing cortical silent period. 5th International Conference on Non-invasive Brain Stimulation, Leipzig, Germany, 2013.

TEACHING EXPERIENCE

UNIVERSITY OF EASTERN FINLAND, KUOPIO, FINLAND

Instructor on Record:

Master's level Functional MRI for Linguistics Spring 2015, Spring 2016, Spring 2017

Master's level Clinical neurophysiology, Spring 2014, Spring 2015, Spring 2016

Guest Lecturing:

Master's level Functional MRI for Physicists, Fall 2015

BOM JESUS CORAÇÃO DE JESUS, FLORIANÓPOLIS, BRAZIL

Instructor on Record:

Teaching assistant in English and IT skills at high school level, Summer 2007

COACHING TEAM EXIMIA LTD, HELSINKI, FINLAND

Instructor on Record

Assistant Teacher in Mathematics and Physics courses preparing for University Entrance Exams, Spring 2006, Summer 2006

FORMAL TRAINING IN TEACHING

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| 2020 | Learning to Teach Online, interactive online course, Coursera, organized by UNSW Sydney, approximately 18 hours of work |
| 2020 | Teaching Science at University, interactive online course, Coursera, organized by University of Zurich, approximately 13 hours of work |
| 2020 | University Teaching, interactive online course, Coursera, organized by the University of Hong Kong, approximately 18 hours of work |
| 2020 | Knowledge of the Fundamentals of Team-Based Learning certificate, 5 interactive face-to-face workshops, organized by the Team-Based Learning Collaborative, approximately 18 hours of work |
| 2018 | Teaching Workshop for Stanford Post Doctoral Scholars, interactive face-to-face workshop, Stanford, CA, 2-day |
| 2017 | An Introduction to Evidence-Based Undergraduate STEM Teaching, CIRTLL Network MOOC, interactive online course, 8-weeks |

MENTORING

UT SOUTHWESTERN MEDICAL CENTER, DALLAS, TX

Informal Research Mentoring (Primary Mentor: Mustafa Husain, M.D.)

2018–2019 Benjamin Pace, M.Sc.

2018–2019 Nicholas George-Jones, M.D.

AALTO UNIVERSITY, ESPOO, FINLAND

Officially appointed Doctoral Advisor

2014 – 2018 Minna Pitkänen D.Sc.(Tech.), Characterization of motor cortical function with navigated transcranial magnetic stimulation

Officially appointed Master's Research Advisor

- 2014 Karita Salo M.Sc.(Tech.), Combining Transcranial Magnetic Stimulation and Electroencephalography to Estimate Cortical Excitability
- 2013 Minna Pitkänen M.Sc.(Tech.), Mapping of cortical hand representations using navigated transcranial magnetic stimulation and functional imaging

Officially appointed Bachelor's Research Advisor

- 2014 Olli Rantula B.Sc.(Tech.), Navigated magnetic stimulation combined with magnetoencephalography in clinical applications
- 2014 Rasmus Zetter B.Sc.(Tech.), Navigated transcranial magnetic stimulation and magnetoencephalography - Technology, applications and combined use

UNIVERSITY OF EASTERN FINLAND, KUOPIO, FINLAND

Officially appointed Master's Research Advisor

- 2016 – 2017 Teemu Karjalainen, M.D., Arterial spin labeling – the effects of excessive alcohol use during adolescence to cerebral perfusion
- 2014 – 2015 Aleksi Montonen, M.D., The use of transcranial magnetic stimulation in rehabilitation of stroke patients with motor deficits

Informal Research mentoring (Primary Mentor: Petro Julkunen, Ph.D.)

- 2018 – now Dao Nguyen, Ph.D. candidate
- 2017 – now Jusa Reijonen, Ph.D. candidate

CLINICAL AND INDUSTRY EXPERIENCE

- 2012 – 2017 Medical Physicist Trainee, Diagnostic Imaging Center, Kuopio University Hospital, Kuopio, Finland. Clinical training in radiotherapy, nuclear medicine, clinical physiology, diagnostic radiology, clinical neurophysiology
- 2011 R&D Trainee, Nexstim Plc. (a manufacturer of brain stimulation devices), Helsinki, Finland
- 2010 Trainee Biomedical Engineer, The Alfred Hospital, Melbourne, Australia
- 2010 Assistant Engineer, Syndome Electronics Industry Co., Ltd., Bangkok, Thailand

EDITORIAL ROLES

2020 – now Applied Sciences, Topic Editor (Brain stimulation)

AD HOC MANUSCRIPT REVIEWING

Verified reviews: <https://publons.com/researcher/1527503/elisa-kallioniemi/>

Applied Sciences
Behavioral Sciences
Biosensors
Brain and Behavior
Brain Sciences
Brain Topography
Cancer
Clinical Neurophysiology
Coatings
Electronics
eNeuro
Frontiers in Neuroscience
Human Brain Mapping
International Journal of Environmental Research and Public Health
Journal of Clinical Neurophysiology
Journal of Neural Engineering
Journal of Neuroscience Methods
Methods and Protocols
Micromachines
Neural Regeneration Research
Neurosciences
Neurosurgical Review
Physiological Measurement
Psychological Medicine
Progress in Neuro-Psychopharmacology and Biological Psychiatry
Robotics
Sensors
Scientific Reports
The Journal of Physiology

DIVERSITY, EQUITY, AND INCLUSION EFFORTS

2021 – now Mentor in the Peer Review for Inclusion, Diversity, and Equity (PRIDE) program
2021 – now Mentor in the Action Potential Advising Program of Simply Neuroscience
2021 Interview with the Humans of Neuroscience, “My path in Neuroscience”
2019 Abstract reviewer for the Annual Biomedical Research Conference for Minority Students, California

- 2017 Stanford Science PenPals Program
- 2007 Taught English and computer skills to disadvantaged adolescents, Bom Jesus Coração de Jesus, Florianópolis, Brazil
- 2004 – 2012 Mentor for incoming exchange students, European Union Erasmus Programme, Aalto University, Espoo, Finland
-

EXTRACURRICULAR UNIVERSITY SERVICE

- 2018 – now Member of Science Policy, Education, and Communication Club, UT Southwestern Medical Center
- 2018 – now Member of Future Leaders in Pedagogy, UT Southwestern Medical Center
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PROFESSIONAL DEVELOPMENT

- 2021 Building Future Faculty Program, North Carolina State University
- 2021 Unconscious Bias and Identity, National Research Mentoring Network
- 2021 Ally Training/LGBTQ-101, UT Southwestern Medical Center
- 2021 How is the Lack of Diversity in Research Hurting the Black Community? Hampton University
-

PROFESSIONAL MEMBERSHIP

- 2019 – now International Neuromodulation Society
- 2019 – now North American Neuromodulation Society
- 2017 – now Organization of Human Brain Mapping
- 2014 – now Finnish Association of Medical Physicists