ANNA ONERVA KORHONEN **CURRICULUM VITAE**

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EDUCATION

Doctoral dissertation "The quest for consistency: Effects of node definition and preprocessing on the structure of functional brain networks" submitted for pre-evaluation on 10.10.2017. The estimated defence date is in February-March 2018.

Master of Science (Tech), Aalto University, School of Science, 16.10.2013

Degree programme in Engineering Physics and Mathematics, major Biomedical Engineering, minor Biological Technology, 123 ECTS credits. The degree was completed with distinction. Master's Thesis "Novel reconstruction-fidelity-optimized cortical parcellation approaches for MEG/EEG inverse modeling".

Bachelor of Science (Tech), Aalto University, School of Science, 14.6.2010

Degree programme in Engineering Physics and Mathematics, major Engineering Physics, minor Biological Technology, 180 ECTS credits. Bachelor's Thesis "Menetelmiä puheen tuottamisen systeemitason hermostollisten mekanismien kartoittamiseen magnetoenkefalografiadatasta" ("Methods for mapping the system level neuronal mechanisms of speech production from magnetoencephalography data").

CURRENT POSITION

Doctoral candidate. Aalto University, School of Science, Department of Computer Science (Complex Systems research area) and Department of Neuroscience and Biomedical Engineering (Brain & Mind Laboratory), 10.2.2014-11.2.2018. Investigated the effects of node definition and preprocessing on the structure of functional brain networks constructed from fMRI data. Participated planning research projects, preprocessed and analyzed data, contributed for preprocessing and analysis methods, reported results in scientific publications. Instructed undergraduate students and strongly participated in group's teaching duties.

SCIENTIFIC EXPERIENCE

Research assistant, Master's Thesis student. University of Helsinki, Neuroscience Center, Matias Palva group, 1.9.2011-31.3.2014. Further developed methods for synchrony-based temporal clustering of MEG and EEG data. Developed a novel method for selecting the vertices used to obtain time series of brain regions that could be used as nodes of functional brain networks and validated the method with both simulated and real MEG and EEG data. Described this method in my Master's Thesis and participated writing a related scientific publication. Contributed for preprocessing and analysis tools for other research projects of the group.

Research assistant. Technische Universität München, department of physics, chair of theoretical biophysics (T35, Leo van Hemmen), 1.6.-31.7.2011. Investigated synchronization in a neuron-level network simulated in terms of the Hodgin-Huxley model.

Research assistant. University of Helsinki, Neuroscience Center, Matias Palva group, 24.5.-17.8.2010. Developed methods for dividing MEG and EEG data into microstates based on the inter-vertex synchronization profile and validated the methods with simulated data.

Research assistant, Bachelor's Thesis student. Aalto University, School of Science/Helsinki University Hospital, BioMag Laboratory, 1.6.-31.8.2009. Worked in a project that investigated the possibilities of using time-frequency analysis of MEG data for localizing the speech-related areas in the brain. Participated in MEG and EEG data collection, analysed the data, and reported results in my Bachelor's Thesis.

TEACHING EXPERIENCE

Complex Networks course for master and doctoral students. Teaching assistant 2014-2017, head assistant 2015-2016. Participated planning the course, prepared exercise problems, instructed students in the exercise sessions, and graded students' solutions. As the head assistant coordinated the work of other teaching assistants and practical matters related to the course. In 2015, the course was based on student feedback selected as the second-best small course (10-49 students that gave feedback) in the department of computer science.

Hands-on Network Analysis course for master and doctoral students. Teaching assistant 2016-2017. Participated planning the course, tutored a student group working on a small research project.

Mathematical Methods in Network Science course for master and doctoral students. Teaching assistant 2017. Planned the course together with the lecturer; the course was organized for the first time. Prepared exercise problems, instructed students in the exercise sessions, and graded students' solutions.

Master's Thesis instruction. I am currently instructing two Master's Thesis students, Ana Maria Triana Hoyos and Elisa Ryyppö, who are both expected to graduate in spring 2018.

POSITIONS OF TRUST

Doctoral Program Brain & Mind, student council. Member 2015. The main responsibility of the student council is to organize the annual symposium of the programme. In 2015, the symposium was a two-day event including invited international speakers, a workshop about presentation skills, and social program. In the symposium, I chaired a session titled "The brain as a complex system: Criticality and multi-scale oscillations".

PUBLICATIONS

Elisa Ryyppö, Enrico Glerean, Elvira Brattico, Jari Saramäki, Onerva Korhonen 2017. Regions of Interest as nodes of dynamic brain networks. Submitted to *Network Neuroscience*, available at https://arxiv.org/abs/1710.04056.

Tuomas Alakörkkö, Heini Saarimäki, Enrico Glerean, Jari Saramäki, Onerva Korhonen 2017. Effects of spatial smoothing on functional brain networks. Accepted for publication in *European Journal of Neuroscience*. doi: 10.1111/ejn.13717

Onerva Korhonen, Heini Saarimäki, Enrico Glerean, Mikko Sams, Jari Saramäki 2017. Consistency of Regions of Interest as nodes of fMRI functional brain networks. *Network Neuroscience* 1(3), 254-274. doi: 10.1162/NETN_a_00013

Onerva Korhonen, Satu Palva, J. Matias Palva 2014. Sparse weightings for collapsing inverse solutions to cortical parcellations optimize M/EEG source reconstruction accuracy. *Journal of Neuroscience Methods* 226.

J. Matias Palva, Alexander Zhigalov, Jonni Hirvonen, Onerva Korhonen, Klaus Linkenkaer-Hansen, Satu Palva 2013. Neuronal long-range temporal correlations and avalanche dynamics are predictive of behavioral scaling laws. *Proceedings of the National Academy of Sciences of the United States of America* 110(9).

PUBLIC TALKS AND PRESENTATIONS

The 6th International Conference on Complex Networks and Their Applications, Lyon, France, 29.11.-1.12.2017. Abstract "Regions of Interest as nodes of dynamic functional brain networks" accepted for an oral presentation in a form of regular talk.

The Complex Brain satellite session at Conference on Complex Systems, Amsterdam, The Netherlands, 20.9.2016. A talk on "Consistency of Regions of Interest as nodes of functional brain networks measured by fMRI".

Brain & Mind Student Symposium, Doctoral Program Brain & Mind, Helsinki, Finland, 15.-

16.8.2016. A snap-shot talk on “Regions of Interest do not exist”.

FGSN/B&M Alumni Day, Helsinki, Finland, 15.12.2015. A snap-shot talk on “The quest for consistency: How to define nodes of functional brain networks?”.

Brain & Mind Student Symposium, Doctoral Program Brain & Mind, Kirkkonummi, Finland, 17.-18.9.2015. A poster presentation on “How does spatial smoothing affect fMRI brain networks?”.

Brain networks satellite session at NetSci 2015, Zaragoza, Spain, 1.-2.6.2015. A poster presentation on “Effects of spatial resolution and smoothing on properties of functional brain networks extracted from resting-state fMRI data”.

Brain & Mind Student Symposium, Doctoral Program Brain & Mind, Kirkkonummi, Finland, 11.-12.9.2014. A poster presentation on “Effects of spatial resolution and smoothing on properties of functional brain networks extracted from resting-state fMRI data”.

North Atlantic Network Summit 2014. Reykjavik, Iceland, 23.-25.4.2014. A talk about “How fMRI preprocessing affects the properties of functional brain networks?”.

OCCAM 2012. Osnabrück, Germany, 4.-6.6.2012. A poster presentation on “Optimal cortical parcellations for M/EEG-based interaction mapping”.

Scientists in Schools program (a popularization of science program targeting students of comprehensive schools and high schools), Aalto University, LUMA Centre. Within the framework of the program, altogether 7 visits to primary schools, secondary schools, and high schools in 2016-2017 and 5 more visits agreed for autumn 2017. Talks titled “Miten ihmisaivoja tutkitaan (ja mitä niistä ylipäätään voidaan tietää)?” (How we study the human brain (and what we can actually know about it)?) and “Internet, junat, ihmiset – verkot ympärillämme” (Internet, trains, people – networks around us).

GRANTS

Foundation for Aalto University Science and Technology. 15 000 eur grant for finalizing the doctoral dissertation. 1.10.2017-31.3.2018