Aaron Julian Gutknecht

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Personal Details

Date/Place of birth: 05.04.1991, Lich, Germany
Nationality: German

Academic Education

2023 - **Postdoc**

Campus Institute for Dynamics of Biological Networks, Georg-August University Göttingen, Germany

2019 - 2023 **PhD in Theoretical and Computational Neuroscience**

Campus Institute for Dynamics of Biological Networks, Georg-August University Göttingen, Germany

Grade: Summa Cum Laude (with highest honors)

PhD Thesis: “Information, Logic, and Inference in the Analysis of Complex Networks”

Thesis Advisors:

Prof. Michael Wibral (Georg-August University Göttingen)
Prof. Fred Wolf (Max Planck Institute for Dynamics and Self-Organisation)
Dr. Lionel Barnett (University of Sussex, UK)

2018 – 2019 **Smart Start 2 Fellow**
Forschungszentrum Jülich, Jülich, Germany

One-year scholarship program offered by the Bernstein Network for Computational Neuroscience (supervised by Prof. Michael Wibral and Dr. Lionel Barnett)

2016 – 2018 **Master of Science in Cognitive Science**
University of Osnabrück, Osnabrück, Germany

Grade: 1.0 (with distinction)

Master Thesis: “Information Decomposition for Continuous Neural Data”

Semester abroad: Sackler Centre for Consciousness Science, University of Sussex, Brighton, UK

2012 – 2016 **Bachelor of Arts in Philosophy and Ethnology**
Goethe-University, Frankfurt am Main, Germany

Grade: 1.0 (with distinction)

Bachelor Thesis: “Error-Statistical Evidence, Neyman-Pearson Hypothesis Testing, and Scientific Justification”

Semester abroad: University College Dublin, Ireland

2010 – 2012 **Biophysics, BSc Studies**
Goethe-University, Frankfurt am Main, Germany

2001 – 2010 **Abitur**
Starkenburg-Gymnasium, Heppenheim, Germany

Teaching Experience

2024	**Introduction to Applied Statistics** Georg-August University, Göttingen, Germany
2022	**Introduction to Bayesian Inference and Information Theory** Georg-August University, Göttingen, Germany
2016	**Tutorial „Foundations of Logic“** University of Osnabrück, Osnabrück, Germany
2015	**Tutorial „Introduction to Logic“** Goethe-University, Frankfurt am Main, Germany
2013	**Tutorial „Introduction to Logic“** Goethe-University, Frankfurt am Main, Germany

Other Professional Experience

2020-	**Research Assistant at the MEG Lab, Brain Imaging Center, Goethe University Frankfurt**
2015	**Reviewer and author for the Open-MIND Project edited by Prof. Thomas Metzinger und Dr. Jennifer M. Windt (https://open-mind.net/)**

Awards and Scholarships

2018 - 2019	**Smart Start 2 Fellow (one-year scholarship program offered by the Bernstein Network for Computational Neuroscience)**
2014 – 2018	**Scholar of the German National Scholarship Foundation (Studienstiftung des deutschen Volkes)**
2017	**Erasmus Scholar**
2014	**Erasmus Scholar**
2010	**Award of the German Physical Society (Deutsche Physikalische Gesellschaft) for very good performance in physics**

Skills

Languages	German (native speaker), English (fluent speaker)
Programming	Python, Matlab, R

Selected Publications

2024 Rosas, F. E., Gutknecht, A., Mediano, P. A., & Gastpar, M. (2024). Characterising high-order interdependence via entropic conjugation. *arXiv preprint arXiv:2410.10485*.

2023 Gutknecht, A. J. (2023). Information, Logic, and Inference in the Analysis of Complex Networks. PhD Thesis. https://ediss.uni-goettingen.de/handle/11858/15045

2023 Gutknecht, A. J., & Barnett, L. (2023). Sampling distribution for single-regression Granger causality estimators. *Biometrika*. doi:10.1093/biomet/asad009

2023 Gutknecht, A. J., Makkeh, A., & Wibral, M. (2023). From Babel to Boole: The Logical Organization of Information Decompositions. *arXiv preprint arXiv:2306.00734*.

2023 Gutknecht, A. J., & Wibral, M. (2023). Significant subgraph mining for neural network inference with multiple comparisons correction. *Network Neuroscience*, 1-35.

2021 Gutknecht, A. J., Wibral, M., & Makkeh, A. (2021). Bits and pieces: Understanding information decomposition from part-whole relationships and formal logic. *Proceedings of the Royal Society A*, *477*(2251), 20210110.

2021 Makkeh, A., Gutknecht, A. J., & Wibral, M. (2021). Introducing a differentiable measure of pointwise shared information. *Physical Review E*, *103*(3), 032149.

2021 Schick-Poland, K., Makkeh, A., Gutknecht, A. J., Wollstadt, P., Sturm, A., & Wibral, M. (2021). A partial information decomposition for discrete and continuous variables. *arXiv preprint arXiv:2106.12393*.

2020 Pinzuti, E., Wollstadt, P., Gutknecht, A., Tüscher, O., & Wibral, M. (2020). Measuring spectrally-resolved information transfer. *PLoS computational biology*, *16*(12), e1008526.

2016 Gutknecht, A. J. (2015). The “Bottom-Up” Approach to Mental Life - A Commentary on Holk Cruse & Malte Schilling. In: Metzinger, Thomas & Windt, Jennifer M. (Eds.) (2015): Open Mind: Philosophy and the Mind Sciences in the 21st Century. Cambridge (Massachusetts): MIT Press.