

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**
Starkenburger-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.