AMY ROMANELLO

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SUMMARY

Candidate for a PhD in Neuroscience with expertise in analyzing multidimensional datasets. Skilled in algorithm design and applied mathematics in MRI analysis, including statistical modeling, signal processing, and unsupervised learning. Proven record of high-impact publications, with exceptional project management, communication, and data visualization skills.

EDUCATION

Candidate for PhD in Neuroscience **Oct 2020 - Present**
Charité – University of Medicine & Berlin School of Mind and Brain Berlin, Germany

- Thesis on temporal complexity of resting-state brain signals
- Expected submission: November 2025

Master of Science in Medical Neuroscience **Sep 2018 - Oct 2020**
Charité – University of Medicine, GPA: 1.7 (DE) ≈ 3.3 (USA) Berlin, Germany

- Thesis on altered functional connectivity dynamics in multiple sclerosis

Bachelor of Science in Behavioral Neuroscience **Aug 2013 - May 2018**
Northeastern University, GPA: 3.9 (USA) ≈ 1.1 (DE) Boston, MA

- Relevant coursework in calculus & differential equations, physics, scientific writing, clinical neuroscience and psychology

WORK EXPERIENCE

Research Associate, Cognitive Neurology Lab **Oct 2023 - Present**
Department of Neurology, Charité – Universitätsmedizin Berlin Berlin, Germany

- Analyze multimodal datasets (incl. T1w, fMRI, neuropsychological and clinical data) to identify alterations in brain structure and function that relate to cognition in patients with MS, NMOSD, and autoimmune encephalitis
- Develop and maintain a Python-based quality control application used across the lab to ensure the integrity of MRI segmentations from Freesurfer
- Designed and implemented a novel algorithm to simulate the development of white and grey matter shape using fractal geometry in MATLAB
- Updated software to calculate morphometrics from anatomical MRI, including substantial customization and deployment of Docker containers
- Leverage high-performance computing (BIH) and manage lab remote server

PhD Candidate, Cognitive Neurology Lab **Oct 2020 - Present**
Department of Neurology, Charité – Universitätsmedizin Berlin Berlin, Germany

- Investigate the dynamics of spontaneous brain activity, employing entropy measures and graph-based connectivity analysis to link local signal properties to the brain's global network architecture
- Developed a novel algorithm for measuring the dissimilarity of patterns with BOLD signals and applied this framework to in-house datasets

- Collaborate with interdisciplinary teams to design and refine studies
- Prepare high-quality manuscripts for publication of results, with a focus on communicating complex findings in an understandable, yet detailed manner

Research Intern (Master's Student), Cognitive Neurology Lab — **Jul 2019 - Sep 2020**
Department of Neurology, Charité – Universitätsmedizin Berlin — Berlin, Germany

- Assisted in the development and validation of fMRI preprocessing pipelines in MATLAB and Bash
- Developed advanced statistical analysis skills, including unsupervised clustering, independent/principal component analysis, and regression modeling to investigate altered functional network dynamics in MS (thesis project)
- Strengthened programming skills in multiple languages and learned methods for network visualization using Python-based applications and R (e.g., SurfIce, ggplot suite, igraph)

Research Intern, Psychotropic Substances Research Group — **Jan 2019 - Present**
Department of Psychiatry, Charité – Universitätsmedizin Berlin — Berlin, Germany

Community Residence Counselor, McLean Hospital — **Jul 2015 - Sep 2018**
Cambridge Residence for Dialectical Behavior Therapy in Borderline Personality Disorder — Cambridge, MA

Mental Health Counselor, North Shore Medical Center — **Jul 2015 - Aug 2017**
Inpatient Child and Adolescent Psychiatry Unit — Lynn, MA

Undergrad. Research Assistant, Center for Translational Neuroimaging — **Aug 2016 - Dec 2016**
PI: Craig Ferris, Northeastern University Dept. of Psychology — Boston, MA

Undergrad. Research Assistant, Aggression Lab — **May 2014 - Dec 2014**
PI: Richard Melloni Jr, Northeastern University Dept. of Psychology — Boston, MA

TEACHING EXPERIENCE

For graduate students at the Berlin School of Mind and Brain, Humboldt-Universität zu Berlin

MATLAB Programming, WiSe 24/25 (Course design & full semester lecturer)
Maps and Measures: Applied Neuroscience Methods, SoSe 23, 25 (Guest lectures)
Clinical Neuroscience Tutorial, WiSe 21/22, 22/23, 23/24, 24/25 (Guest lectures)

TECHNICAL SKILLS

Listed in order of active use (updated 09/2025)

Programming languages
- MATLAB (6 years)
- Python (1 year)
- R (4 years)
- Shell scripting (4 years)
- SQL (ongoing free-time learning)

Development tools
- Git, GitHub
- Pycharm, VSCode
- Docker
- Asana, Miro

MRI tools
- FreeSurfer
- fMRIPrep & CONN Toolbox
- FSL
- SPM

ADDITIONAL INFORMATION

- **Languages:** English (Native), German (A2)
- **Interests:** Traveling, building interactive artwork, knitting

SELECTED PUBLICATIONS

Romanello, A., Krohn, S., von Schwanenflug, N., Chien, C., Bellmann-Strobl, J., Ruprecht, K., Paul, F., & Finke, C. (2022). Functional connectivity dynamics reflect disability and multi-domain clinical impairment in patients with relapsing-remitting multiple sclerosis. ***NeuroImage: Clinical***, 36, 103203. https://doi.org/10.1016/j.nicl.2022.103203

Romanello, A., von Schwanenflug, N., Paul, F., Prüss, H., Krohn, S.*, Finke, C.* (2025). Functional connectivity is linked to symbolic BOLD patterns: replication, extension, and clinical application of the human 'complexome'. **(Submitted).** Preprint: https://doi.org/10.1101/2025.09.05.674447

Krohn, S., **Romanello, A.**, von Schwanenflug, N., Rasmussen J. M., Buss, C., Valk, S. L., Madan, C. R., & Finke, C. (2025). The formation of brain shape in human newborns. ***Accepted (provisional).*** Preprint: https://doi.org/10.1101/2023.01.01.521756

Krohn, S., von Schwanenflug, N.*, Waschke, L.*, **Romanello, A.**, Gell, M., Garrett, D. D., & Finke, C. (2023). A spatiotemporal complexity architecture of human brain activity. ***Science Advances,*** 9(5). https://doi.org/10.1126/sciadv.abq3851

Krohn, S., Müller-Jensen, L., Kuchling, J., **Romanello, A.**, Wurdack, K., Rekers, S., Bartsch, T., Leypoldt, F., Paul, F., Ploner, C. J., Prüss, H., & Finke, C. (2025). Cognitive Deficits in Anti-LGI1 Encephalitis Are Linked to Immunotherapy-Resistant White Matter Network Changes. ***Neurology Neuroimmunology & Neuroinflammation***, 12(2), e200360. https://doi.org/10.1212/NXI.0000000000200360

von Schwanenflug, N., Ramirez-Mahaluf, J. P., Krohn, S., **Romanello, A.**, Heine, J., Prüss, H., Crossley, N. A., & Finke, C. (2023). Reduced resilience of brain state transitions in anti-N -methyl-D-aspartate receptor encephalitis. ***European Journal of Neuroscience***, 57(3), 568–579. https://doi.org/10.1111/ejn.15901

ADDITIONAL PUBLICATIONS

Bendau, A., Viohl, L., Petzold, M. B., Helbig, J., Reiche, S., Marek, R., **Romanello, A.**, Moon, D. U., Gross, R. E., Masah, D. J., Gutwinski, S., Mick, I., Montag, C., Evens, R., Majić, T., & Betzler, F. (2022). No party, no drugs? Use of stimulants, dissociative drugs, and GHB/GBL during the early COVID-19 pandemic. ***International Journal of Drug Policy***, 102, 103582. https://doi.org/10.1016/j.drugpo.2022.103582

Brandt, L., Evens, R., Reiche, S., Marek, R. M., Moon, D. U., Groß, E., **Romanello, A.**, Masah, D. J., Scicchitano, M., Gutwinski, S., Montag, C., Majić, T., & Mick, I. (2021). Predictors of Alcohol Consumption Among Younger Adults During the First Phase of the COVID-19 Pandemic. ***Frontiers in Psychiatry***, 12, 748158. https://doi.org/10.3389/fpsyt.2021.748158

Evens, R., Reiche, S., Marek, R. M., Moon, D. U., Groß, R. E., **Romanello, A.**, Jalilzadeh Masah, D., Scicchitano Böckheler, M., Gutwinski, S., Montag, C., Mick, I., & Majić, T. (2021). Psychedelic Experiences During the Early COVID-19 Pandemic: Findings From an International Online Survey. ***Frontiers in Psychiatry***, 12, 732028. https://doi.org/10.3389/fpsyt.2021.732028

Mielau, J., Reiche, S., Moon, D. U., Groß, E., Gutwinski, S., Betzler, F., **Romanello, A.**, Masah, D. J., Scicchitano, M., Marek, R., Brandt, L., Evens, R., Mick, I. M., Majić, T., & Montag, C. (2023). Cannabis use during the early COVID-19 pandemic: Use patterns, predictors, and subjective experiences. ***Frontiers in Psychiatry***, 13, 1037451. https://doi.org/10.3389/fpsyt.2022.1037451

Mielau, J., Evens, R., Reiche, S., Marek, R., Moon, D. U., Groß, E., **Romanello, A.**, Masah, D. J., Brandt, L., Gutwinski, S., Montag, C., Majić, T., & Mick, I. M. (2024). Consumption Patterns of Benzodiazepines and Opioids Drawn from an Online Survey in the Early COVID-19 Pandemic. ***SUCHT***, 70(1), 45–55. https://doi.org/10.1024/0939-5911/a000853

CONFERENCE POSTERS

Anderhalten, L.***, Romanello, A.*,** et al. Longitudinal increases in blood ketone levels are linked to functional connectivity changes in MS. Presented at the ***10th Annual Americas Committee for Treatment and Research in Multiple Sclerosis (ACTRIMS) Forum.*** 2025. West Palm Beach, Florida, USA.

Romanello, A., et al. Reduced functional connectivity in autoimmune encephalitis is explained by BOLD pattern incongruency. Presented at the ***30th Annual Meeting of the Organization for Human Brain Mapping.*** 2024. Seoul, South Korea.

Romanello, A., et al. Time-resolved BOLD-signal complexity: an out-of-sample replication study. Presented at the ***29th Annual Meeting of the Organization for Human Brain Mapping.*** 2023. Montreal, Canada.

Romanello, A., et al. Functional connectivity dynamics vary with disease severity in patients with multiple sclerosis. Presented at the ***28th Annual Meeting of the Organization for Human Brain Mapping.*** 2022. Glasgow, Scotland.

*These authors contributed equally to this work.