Alina Brighty Renli

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Education

- **Michigan State University Honors College** (9/2021 – 12/2024, expected)
  Major: Computational Neuroscience/Psychology, Unweighted GPA: 3.947, major GPA: 4.0
  - **Relevant Courses in Neuropsychology:** Neuroscience, Cognitive and Behavioral Psychology, Neurological Abnormalities, Physiology, Microbiology, Linguistics in Neuroscience, Biochemistry
  - **Math, Physics, and Engineering courses:** Calculus (I and II), Multivariable Calculus, Linear Algebra, Differential Equations, Physics for Engineers (I and II), Circuits and Systems, Statistics, Analog and Digital Communications Systems
  - **Programming and Data Processing:** MATLAB, Python, and some R Studio, **EEG** data preprocessing using EEGlab, fMRI and EEG data analysis
  - **Ongoing and planned courses/trainings:** Biomedical Instrumentation, Matrix Algebra with Computational Applications, Digital Signal Processing, **fMRI** data preprocessing and Region of Interest analysis, **EEG** and **MR-EEG** data collection
- **Okemos High School** (2017-2021): Unweighted GPA: 3.97/4.0

Honors

- National Merit Finalist (2021)
- National AP Scholar, AP Scholar with Distinction, AP Scholar with Honor (2021)
- National Merit MSU Scholarship (2021–present)
- Honors College State Award (2021–present)
- MSU Michigan Resident Scholarship (2021–present)
- MSU Honors College Professorial Assistant Scholarship (2021–2023)
- MSU Honors College Research Scholars Program/Winters Scholar (2023–2024)

Research Experience

Professorial Assistant: Broadband Access Wireless Communication Lab, **Department of Electrical & Computer Engineering, Cognitive Imaging Research Center,** MSU, and Michigan Alzheimer's Disease Research Center (2018–present)

- Computational modeling and evaluation of dynamic brain activity, functional connectivity & causality.
- Biomarkers for early detection of mild cognitive impairment and Alzheimer's disease based on experimental EEG and fMRI data.
- Machine learning based brain signal space reconstruction based on 1D observations.

Publications

Journal Papers

1. Jinxian Deng, Boxin Sun, Norman Scheel, **Alina Brighty Renli**, David Zhu, Dajiang Zhu, Jian Ren, Tongtong Li and Rong Zhang. (2023). Causalized Convergent Cross Mapping and its Ap-

proximate Equivalence with Directed Information in Causality Analysis, *PNAS nexus*, 3(1), pgad422. https://doi.org/10.1093/pnasnexus/pgad422

2. Yuan Liang, Yu Zheng, **Alina Brighty Renli**, David C. Zhu, Fang Yu and Tongtong Li. Dynamic Functional Connectivity Fading Analysis and Classification of Alzheimer's Disease, Mild Cognitive Impairment and Normal Control Subjects based on Resting-State fMRI Data, *OBM Neurobiology*, 2020; 4(2):20; `https://doi.org/10.21926/obm.neurobiol.2002059`.
3. **Alina Brighty Renli**, Boxin Sun, Ming Gu, Voyko Kavcic, Tongtong Li and Bruno Giordani, Altered Effective Connectivity Patterns in MCI Patients during Motion Detection Tasks: an EEG study, *under preparation.*

Posters and Presentations

1. **Alina Brighty Renli**, Boxin Sun, Ming Gu, Jinxian Deng, Voyko Kavcic, Tongtong Li, and Bruno Giordani, Altered Effective Connectivity Patterns in Low-Gamma Band for MCI Patients in Motion Detection Tasks, *Alzheimer's Association International Conference (AAIC 2024)*, July 28–August 1, 2024, Philadelphia, USA, and Online.
2. Boxin Sun, Jinxian Deng, **Alina Brighty Renli**, Voyko Kavcic, Jian Ren, Bruno Giordani, Rong Zhang, and Tongtong Li, Evaluating Time-Delayed Effective Connectivity for Normal Cognition and MCI under Motion Detection Tasks: an EEG Study, *Alzheimer's Association International Conference (AAIC 2024)*, July 28–August 1, 2024, Philadelphia, USA, and Online.
3. **Alina Brighty Renli**, Ming Gu, Boxin Sun, Tongtong Li, Voyko Kavcic, and Bruno Giordani, Low-Gamma Band Reveals Different Effective Connectivity Patterns between Healthy Controls and MCI Patients in Motion Detection Tasks, *submitted to MOBI 2024,* 5th International Mobile Brain/Body Imaging Conference, June 2–5, 2024, Piran, Slovenia.
4. **Alina Brighty Renli**, Boxin Sun, Ming Gu, Tongtong Li, Voyko Kavcic and Bruno Giordani, EEG-based Analysis Reveals Different Effective Connectivity Patterns between Healthy Controls and MCI Patients in Motion Detection Tasks, *Alzheimer's Association International Conference (AAIC)*, July 16-20, 2023, Amsterdam, Netherlands, and Online.
5. **Alina Brighty Renli**, Boxin Sun, Ming Gu, Tongtong Li, Voyko Kavcic and Bruno Giordani, Alternations of Effective Connectivity Patterns in Mild Cognitive Impairment: An EEG Study, *Michigan Alzheimer's Disease Reserch Center (MADRC) 7th Annual Beyond Amyloid Research Symposium*, Detroit, Michigan, May 19, 2023.
6. **Alina Brighty Renli**, Emma Niebrzydoski, Michael Moore and Mark Reimers, Utilization and Application of Deep Learning Software in Brain Activity Analysis of Animal Models, *2022 Mid-Michigan Symposium for Undergraduate Research Experiences (MID-SURE)*, East Lansing, Michigan, July 26, 2022.
7. **Alina Brighty Renli**, Yu Zheng, David Zhu and Tongtong Li, Fading Effect Analysis in Time-Varying Functional Connectivity for AD, MCI and NC Based on Resting-State fMRI Data, *IEEE International Engineering in Medicine and Biology Conference (EMBC) 2019*, Berlin, Germany.

Clinical Experience

- Volunteered as a patient concierge in the Emergency Department at Sparrow Hospital (2023)
- Shadowed physicians working in Emergency and Pain Management specializations (2023)

Other Experience

Music Performance

- Placed 1st twice in the Eileen Keel Sonata/Sonatina Piano Competition
- Selected to perform in the All-State Orchestra, MSBOA as 2nd Chair cellist
- Principal Cellist in Okemos High School Philharmonic Orchestra
- Selected to perform at Blue Lake Fine Arts Music Camp (Summer 2016 and 2017)

Language and Writing Qualifications

- Experience in creative and technical writing, as well as preparing science-related presentations and creating websites.
- Fluent in Chinese language/Mandarin

Art and Design

- Drawing experience in realism and digital art
- Digital art animation
- Graphic design and Adobe Photoshop ability