# Adebayo Braimah

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**PRINCIPAL INTERESTS**

Artificial intelligence, deep learning, medical image analysis, technical writing, and applications to multimedia processing.

**EDUCATION**

*Ph.D. Student, Computer Science*                    Aug 2022 - Present
Stony Brook University, Stony Brook, NY

*M.S. Neuroimaging & Informatics*                    Aug 2017 - May 2018
University of Southern California, Los Angeles, CA

*B.S. Chemistry (ACS Certified) & Mathematics*       Jun 2012 - Jul 2017
University of Kansas, Lawrence, KS

**RESEARCH EXPERIENCE**

*Graduate Research Assistant*                        Jan 2023 – May 2023
Department of Computer Science
Stony Brook University, Stony Brook, New York
- Project: Loss landscape analysis of neural networks.
- Supervisor: Asst. Prof. Yifan Sun, PhD
- Focus: Eigenspectrum decomposition methods for very large matrices

*Research Software Engineer*                          Jun 2018 - Jul 2022
Imaging Research Center
Department of Radiology
Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio
- Project: Functional and structural connectivity in neonates with hypoxic ischemic encephalopathy (HIE).
  - Principal investigator: Assoc. Prof. Stephanie Merhar, MD, MS
- Project: Functional and structural connectivity in neonates with neonatal abstinence syndrome (NAS).
  - Principal investigators: Assoc. Prof. Stephanie Merhar, MD, MS and Assoc. Prof. Nehal Parikh, DO, MS
- Project: Pre-clinical functional connectivity in rats to assess acute response to ketamine.
  - Principal investigator: Assoc. Prof. Diana Lindquist, PhD
- Project: Functional connectivity in school-aged children with ADHD to assess sluggish cognitive tempo (SCT).
  - Principal investigators: Assoc. Prof. Stephen P. Becker, PhD, Prof. Leanne Tamm, PhD, and Prof. Jeffery N. Epstein, PhD.
- Project: Structural connectivity in children to assess the effects of environmental exposure to air pollution.
  - Principal investigators: Prof. Kim Cecil, PhD,
- Supervisor: Jonathan Dudley, PhD

- Focus: Pediatric, neonatal and pre-clinical (rodent) neuroimaging, and data/image analysis.

*Volunteer Graduate Research Assistant*       Aug 2017 – May 2018
Laboratory of Neuroimaging (LONI)
Mark & Mary Steven's Hall for Neuroimaging and Informatics
University of Southern California, Los Angeles, California
- Project: Pre-seizure EEG data analysis of epileptic patients and rats using unsupervised diffusion component analysis (UDCA).
- Project: MRI analysis of epileptic patients and rats.
- Supervisor: Asst. Prof. Dominique Duncan, PhD
- Focus: Single and multi-subject neuroimaging data analyses for the Epilepsy Bioinformatics Study for Antiepileptogenic Therapy (EpiBioS4Rx) Project.

*Volunteer Undergraduate Research Assistant*       Jun 2016 – Jul 2017
Department of Molecular Biosciences
University of Kansas, Lawrence, Kansas
- Project: Computational self-assembly simulations of the Rhodococcus 20S proteasome (PDB: 1Q5R).
- Supervisors: Assoc. Prof. Eric Deeds, PhD and Abhishek Mallela
- Focus: Computational simulations

*Undergraduate Research Assistant*       Oct 2013 – Jul 2016
Department of Chemistry
University of Kansas, Lawrence, Kansas
- Project: Dye-protein investigation with circularly polarized light.
- Supervisor: Prof. Carey K. Johnson, PhD and Will Newhart
- Focus: Spectropolarimetric analysis of fluorescently labeled proteins.

**PROFESSIONAL AFFILIATIONS & ACTIVITIES**

*International Society for Magnetic Resonance in Medicine (ISMRM)*       Apr 2020 – Apr 2023
- Affiliation: Member

*Engineering in Medicine and Biology Conference (EMBC)*       Nov 2020 – Nov 2022
- Affiliation: Abstract reviewer

*American Chemical Society (ACS)*       Feb 2015 - Jun 2018
- Affiliation: Member

**EMPLOYMENT HISTORY**

*Graduate Teaching Assistant*       Aug 2022 – Present
Department of Computer Science
Stony Brook University, Stony Brook, New York
- Facilitated tutorials, held weekly office hours, graded assignments and exams, created and distributed supplementary notes and reading materials.

*Research Software Engineer*            Jun 2018 - Jul 2022
Imaging Research Center
Department of Radiology
Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio

- Performed analyses of brain and abdominal MR images.

- Aggregated and organized imaging data for (pilot) studies.

*Mutual Fund/Data Processing Associate*      Oct 2015 - Jul 2017
DST/Boston Financial Data Services, Lawrence, Kansas

- Organized and processed categorical financial data for mutual fund investments.

*Undergraduate Research Assistant*      Oct 2013 – Jul 2016
Department of Chemistry
University of Kansas, Lawrence, Kansas

- Utilized spectropolarimetry to assess fluorescent dye−protein interactions.

- Wrote laboratory protocols.

**SKILLS**

Proficient with:

- Python, Bash/shell scripting, MATLAB, R (& R Studio), LaTeX

Familiar with:

- C/C++

**PERSONAL PROJECTS**

*convert_source*

- Python package published on the python package index (PyPi) that converts and reorganizes DICOM, and PAR REC medical images to BIDS NIFTI data.

- Implemented automated tests with continuous itegration pipeline via CircleCI.

- Wrote documentation (hosted on Read the Docs).

*gift_exchange*

- Jupyter notebook that contains python code that randomizes participants for a secret santa gift exchange.

- Sends text messages to all participants involved using the Twilio python API.

*mk_design*

- Python script that creates design matrices for general linear models (to perform group statistical analyses).

- Command-line settings allow for the inclusion and exclusion of data provided some input CSV file of information.

**JOURNAL PUBLICATIONS**

S. L. Merhar, W. Jiang, N. A. Parikh, W. Yin, Z. Zhou, J. A. Tkach, L. Wang, B. M. Kline-Fath, L. He, **A. Braimah**, J. Vannest, and W. Lin, "Effects of prenatal opioid exposure on functional networks in infancy," *Developmental Cognitive Neuroscience*, vol. 51, p. 100996, Oct. 2021. [Online]. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8363826/

D. B. Gandhi, A. Pednekar, **A. B. Braimah**, J. Dudley, J. A. Tkach, A. T. Trout, A. G. Miethke, M. D. Franck, J. A. Heilman, B. Dzyubak, D. S. Lake, and J. R. Dillman, "Assessment of agreement between manual and automated processing of liver MR elastography for shear stiffness estimation in children and young adults with autoimmune liver disease," *Abdominal Radiology (New York)*, vol. 46, pp. 3927–3934, Aug. 2021. [Online]. Available: https://pubmed.ncbi.nlm.nih.gov/33811261/

M. Parikh, M. Chen, **A. Braimah**, J. Kline, K. McNally, J. Logan, L. Tamm, K. Yeates, W. Yuan, L. He, and N. Parikh, "Diffusion MRI microstructural abnormalities at term-equivalent age are associated with neurodevelopmental outcomes at 3 years of age in very preterm infants," *American Journal of Neuroradiology*, vol. 42, pp. 1535–1542, Aug. 2021. [Online]. Available: http://www.ajnr.org/content/42/8/1535.long

S. Merhar, N. Parikh, **A. Braimah**, B. Poindexter, J. Tkach, and B. Kline-Fath, "White matter injury and structural anomalies in infants with prenatal opioid exposure," *American Journal of Neuroradiology*, vol. 40, pp. 2161–2165, Dec. 2019. [Online]. Available: http://www.ajnr.org/content/40/12/2161

R. Asch, **A. Braimah**, D. Lindquist, J. Schurdak, and R. McNamara, "T122. Omega-3 fatty acids modulate neurochemical and functional responses to acute ketamine in rats: A 7 Tesla multimodal neuroimaging study," *Biological Psychiatry*, vol. 85, p. S176, May 2019

S. Merhar, **A. Braimah**, T. Beiersdorfer, B. Poindexter, and N. Parikh, "3046 reduced structural and functional connectivity in infants with prenatal opioid exposure," *Journal of Clinical and Translational Science*, vol. 3, pp. 52–52, Mar. 2019

D. Duncan, G. Barisano, R. Cabeen, F. Sepehrband, R. Garner, **A. Braimah**, P. Vespa, A. Pitkänen, M. Law, and A. W. Toga, "Analytic tools for post-traumatic epileptogenesis biomarker search in multimodal dataset of an animal model and human patients," *Frontiers in Neuroinformatics*, vol. 0, p. 86, Dec. 2018. [Online]. Available: https://www.frontiersin.org/articles/10.3389/fninf.2018.00086/full

D. Duncan, P. Vespa, A. Pitkänen, **A. Braimah**, N. Lapinlampi, and A. W. Toga, "Big data sharing and analysis to advance research in post-traumatic epilepsy," *Neurobiology of Disease*, Jun. 2018. [Online]. Available: http://www.ncbi.nlm.nih.gov/pubmed/29864492

M. S. Devore, **A. Braimah**, D. R. Benson, and C. K. Johnson, "Single-molecule FRET states, conformational interchange, and conformational selection by dye labels in calmodulin," *The Journal of Physical Chemistry B*, vol. 120, pp. 4357–4364, 2016. [Online]. Available: https://pubs.acs.org/doi/10.1021/acs.jpcb.6b00864

**CONFERENCE ABSTRACTS**

**A. B. Braimah**, J. A. Dudley, J. Epstein, L. Tamm, and S. P. Becker, "Examining the association between sluggish cognitive tempo and functional connectivity in children with ADHD: A pilot study," *ISMRM*, May 2021, in Virtual Conference. [Online]. Available: https://www.ismrm.org/21/program-files/D-85.htm

**A. B. Braimah**, J. A. Dudley, J. Epstein, L. Tamm, and S. P. Becker, "Examining the association between sluggish cognitive tempo and functional connectivity in children with ADHD: A pilot study," *ASNR*, May 2020, in Virtual Conference. [Online]. Available: https://docplayer.net/219618868-Virtual-may-30-june-4.html

D. B. Gandhi, **A. B. Braimah**, J. Dudley, J. A. Tkach, A. Pednekar, A. T. Trout, A. G. Miethke, J. A. Heilman, B. Dzyubak, D. S. Lake, and J. R. Dillman, "Comparison of manual and automatic liver MR elastography processing for shear stiffness estimation in children and young adults," *ISMRM*, Aug. 2020, in Virtual Conference. [Online]. Available: https://archive.ismrm.org/2020/2497.html

**A. B. Braimah**, D. M. Lindquist, R. Asch, J. Schurdak, and R. McNamara, "Effects of Omega-3 fatty acids on brain connectivity in long-evans rats," *ISMRM*, May 2019, in Montreal, Quebec, Canada. [Online]. Available: https://archive.ismrm.org/2019/3683.html

**A. B. Braimah**, W. Newhart, and C. K. Johnson, "Dye-protein investigation with circularly polarized light," *Abstracts of Papers, 251st ACS National Meeting Exposition*, Mar. 2016, in San Diego, CA, USA

**A. Braimah**, W. Newhart, and C. Johnson, "Dye-protein investigation with circularly polarized light," *Abstracts, 50th Midwest Regional Meeting of the American Chemical Society*, Oct. 2015, in St. Joseph, MO, USA

**A. Braimah**, W. Newhart, and C. Johnson, "Dye-protein investigation with circularly polarized light," *Wakarusa Valley ACS Student Research Symposium*, Nov. 2015, in Lawrence, KS, USA