Ani Eloyan

Contact Information

Department of Biostatistics
School of Public Health
Brown University
121 S. Main St, 719
Providence, RI, 02903
Email: ani_eloyan@brown.edu
Website: `http://www.anieloyan.com`

Education

North Carolina State University, Raleigh, NC

Ph.D., Statistics, 2010
Advisor: Sujit Ghosh
Dissertation topic: Semi-Parametric Methods for Independent Component Analysis
M.S., Statistics, 2007

Yerevan State University, Yerevan, Armenia

B.S., Applied Mathematics and Computer Science, 2004

Professional Experience

07/2023 - present, Associate Professor, Vice Chair

Department of Biostatistics, Brown University

07/2015 - 06/2023, Assistant Professor

Department of Biostatistics, Brown University

08/2013 - 06/2015, Assistant Professor

Department of Biostatistics, Johns Hopkins University

10/2010 - 08/2013, Postdoctoral Fellow

Department of Biostatistics, Johns Hopkins University
Mentor: Brian Caffo, Co-Mentor: Ciprian Crainiceanu

06/2008 - 08/2010, Student Tester

JMP Development and Testing, SAS institute Inc.

05/2007 - 05/2008, Instructor

Department of Statistics, North Carolina State University

Academic Service

Review of research proposals:

NSF/Division of Mathematical Sciences, panelist, Statistics program.
DOD/CDMRP/Investigator-Initiated Partnership Award, specialist reviewer - biostatistician, Multiple sclerosis research program.
NSF/DMS with NIH/BD2K, panelist, Statistics program.
Multiple Sclerosis Society, reviewer (ad-hoc).
NSF DMS/NLM Initiative, panelist.

National service:

ENAR Regional Advisory Board member (2019-2021).
JSM, Student Award Reviewer, Imaging Section.
ENAR program committee member (2017).

University service:

Chair of the organizing committee "30 years of Biostatistics at Brown" symposium.
Member of the Committee on Academic Programs and Faculty Affairs.
Member of Faculty Executive Committee.
Member of the SPH Academic Programs Committee.
Member of the Biostatistics Academic Programs Committee.
Member of the PhD Admission Committee.
Member of the MS Admission Committee.
Member of the Tenure Track Faculty Search Committee.
Member of the Website Planning Committee.
Member of the SPH Diversity Planning Advisory Committee.
Faculty advisor for Biostatistics Journal Club.
Brown Biostatistics seminar coordinator (2015-2016).
Johns Hopkins Biostatistics seminar coordinator (2013-2014).

Invited session organizer:

"Statistical Methods for Understanding Brain Organization", JSM 2020.
"Integrated Statistical Methods for Imaging Genomics and Multimodal Imaging", JSM 2017.
"Novel Statistical Methods in Neuroscience", NESS 2016.
"Statistical Methods for Electronic Medical Records: A New Frontier in Health Care Research", JSM 2015 (Topic Contributed).
"Functional Neuroimaging Decompositions", ENAR 2013.

Session Chair:

ENAR (2012) and JSM (2012, 2013, 2014, 2015).

Membership:

American Statistical Association, International Biometric Society/ENAR.

Referee Service

Associate Editor

2016 - 2023, Biostatistics
2015 - 2018, Journal of American Statistical Association (Theory and Methods)

Reviewer

Science, JAMA Open Network
Journal of Royal Statistical Society - Series B
Journal of American Statistical Association (Theory and Methods)
Annals of Applied Statistics, Biostatistics, Biometrics, Technometrics
Journal of Statistical Theory and Practice, International Journal of Biostatistics
Computational Statistics and Data Analysis
Human Brain Mapping, NeuroImage, Nature Scientific Reports
Frontiers in Systems Neuroscience, PloS One, Stroke
Psychiatry Research: Neuroimaging, Pharmacoepidemiology and Drug Safety

Honors and Awards

2021 - Featured as a mentor and an influential woman in statistics and data science by the American Statistical Association

2015 - Best Reviewer for Pharmacoepidemiology and Drug Safety

2011 - Winner of the "ADHD200 Global Competition"
Developed prediction algorithms for 1) finding attention deficit hyperactivity disorder (ADHD) status in children using machine learning and 2) identifying disease biomarkers using functional magnetic resonance imaging.

2007 - Elected to Mu Sigma Rho
2006 - Elected to Phi Kappa Phi

Preprints and submissions

* indicates trainee, + indicates senior author

1. **Zielinski, R.***, Meng, K., and **Eloyan, A.**$^{+}$. Longitudinal Principal Manifold Estimation. *Submitted.* [ArXiv Link]
   - *Winner of the Best Student Poster Award (second place) at the ENAR Conference, 2024.*

2. Mejia, A.F., Bolin, D., Spencer, D.A., and **Eloyan, A.** Accurate estimation of functional brain connectivity via Bayesian ICA with population-derived priors. *Submitted.* [ArXiv Link]

3. **Meng, K.***, Ji, M., Wang, J., Ding, K., Kirveslahti, H., **Eloyan, A.**, and Crawford, L., Statistical Inference on Grayscale Images via the Euler-Radon Transform *Submitted.* [Arxiv Link]

4. **Tung, N.***, Upfal, E., Sanes, J., and **Eloyan, A.**$^{+}$ Neuro-Hotnet: Functional Connectivity Estimation in High Dimensions. [ArXiv Link].

Publications

1. Hector, E.C., Reich, B., and **Eloyan, A.** (2025) Distributed model building and recursive integration for big spatial data modeling. *Biometrics, Methodology.* 81,1, [Link] [ArXiv Link]

2. **Zhang, Y.***, Steingrimsson, J.A., Oh, H., and **Eloyan, A.**$^{+}$. (In Press) Radiomics of PET using Graphical Neural Networks for Prediction of Alzheimer's Disease Diagnosis. *Statistics in Medicine.*

3. Lagarde, J., Maiti, P., Schonhaut, D.R., Blazhenets, G., Zhang, J., **Eloyan, A.**, Thangarajah, M., Taurone, A., Allen, I., Soleimani-Meigooni, D.N., Zeltzer, E., Windon, C.C., Raya, M.A, Vrillon, A., Smith, K., Shankar., R., Amuiri, A.N., Rocha, S., Hammers, D.B., Dage, J.L., Nudelman, K.N., Aisen, P., Koeppe, R., Landau, S.M., Carrillo, M.C., Touroutoglou, A., Brickhouse, M., Vemuri, P., Beckett, L., Reman, R., Atri, A., Day, G.S., Duara, R., Graff-Radford, N.R., Honig, L.S., Jones, D.T., Masdeu, J., Mendez, M., Womack, K., Musiek, E., Onyike, C.U., Riddle, M., Grant, I.M., Rogalski, E., Johnson, E.C.B., Salloway, S., Sha, S., Turner, R.S., Wingo, T.S., Wolk, D.A, Dickerson, B., Apostolova, L.G., La Joie, R., Rabinovici, G.D., and the LEADS Consortium for the Alzheimer's Disease Neuroimaging Initiative. (2025) Amyloid PET in sporadic early- versus late-onset Alzheimer's disease: comparison of the LEADS and ADNI cohorts. *Annals of Neurology.* [Link]

4. Hammers, D.B., Musema, J., **Eloyan, A.**, Thangarajah, M., Taurone, A., Gao, S., Beckett, L., Polsinelli, A.J., Kirby, K., Dage, J.L., Nudelman, K., Aisen, P., La Joie, R., Lagarde, J., Atri, A., Clark, D., Day, G.S., Duara, R., Graff-Radford, N.R., Honig, L.S., Jones, D.T., Masdeu, J., Mendez, M., Womack, K., Musiek, E., Onyike, C.U., Riddle, M., Rogalski, E., Salloway, S., Sha, S., Turner, R.S., Wingo, T.S., Wolk, D.A, Carrillo, M.C., Dickerson, B., Rabinovici, G.D., Apostolova, L.G., and the LEADS Consortium. (2025) Characterizing and validating 12-month reliable cognitive change in Early-Onset Alzheimer's Disease for use in clinical trials. *The Journal of Prevention of Alzheimer's Disease*. [Link]

5. Putcha, D., Katsumi, Y., Touroutoglou, A., **Eloyan, A.**, Thangarajah, M., Taurone, A., Aisen, P., La Joie, R., Lagarde, J., Vemuri, P., Jack, C.R., Dage, J.L., Nudelman, K., Foroud, T., Ghetti, B., Polsinelli, A.J., Raman, R., Beckett, L., Kramer, J., Atri, A., Day, G.S., Duara, R., Graff-Radford, N.R., Honig, L.S., Jones, D.T., Masdeu, J., Mendez, M., Womack, K., Musiek, E., Onyike, C.U., Riddle, M., Grant, I.M., Rogalski, E., Johnson, E., Salloway, S., Sha, S., Wingo, T.S., Wolk, D.A, Carrillo, M.C., Rabinovici, G.D., Dickerson, B., Apostolova, L.G., Hammers, D., and the LEADS Consortium. (2025) Heterogeneous clinical phenotypes of sporadic Early-onset Alzheimer's disease: A neuropsychological data-driven approach. *Alzheimer's Research & Therapy*. [Link]

6. Touroutoglou, A., Katsumi, Y., Brickhouse, M., **Eloyan, A.**, Eckbo, R., Zaitsev, A., Thangarajah, M., Taurone, A., La Joie, R., Lagarde, J., Vemuri, P., Jack, C.R., Dage, J.L., Nudelman, K., Foroud, T., Hammers, D., Ghetti, B., Polsinelli, A.J., Aisen, P., Raman, R., Beckett, L., Kramer, J., Atri, A., Day, G.S., Duara, R., Graff-Radford, N.R., Honig, L.S., Jones, D.T., Masdeu, J., Mendez, M., Womack, K., Musiek, E., Onyike, C.U., Riddle, M., Grant, I.M., Rogalski, E., Johnson, E., Salloway, S., Sha, S., Wingo, T.S., Wolk, D.A, Carrillo, M.C., Rabinovici, G.D., Apostolova, L.G., Dickerson, B., and the LEADS Consortium. (2025) Dissociable spatial topography of cortical atrophy in Early-onset and Late-onset Alzheimer's Disease: A head-to-head comparison of the LEADS and ADNI cohorts. *Alzheimer's & Dementia*. [Link]

7. **Meng, K.***, Wang, J., Crawford, L., and **Eloyan, A.**$^+$ (2024) Randomness of Shapes and Statistical Inference on Shapes via the Smooth Euler Characteristic Transform. *JASA, T & M*. [Link] [Arxiv Link]

8. **Meng, K.*** and **Eloyan, A.**$^+$ (2024) Population-level Task-evoked Functional Connectivity. *JRSS - C*. 73, 4, 857–879. [Link] [ArXiv Link]

9. Hammers, D.B., **Eloyan, A.**, Taurone, A., Thangarajah, M., Gao, S., Beckett, L., Polsinelli, A.J., Kirby, K., Dage, J.L., Nudelman, K., Aisen, P., La Joie, R., Lagarde, J., Atri, A., Clark, D., Day, G.S., Duara, R., Graff-Radford, N.R., Honig, L.S., Jones, D.T., Masdeu, J., Mendez, M., Womack, K., Musiek, E., Onyike, C.U., Riddle, M., Rogalski, E., Salloway, S., Sha, S., Turner, R.S., Wingo, T.S., Wolk, D.A, Carrillo, M.C., Dickerson, B., Rabinovici, G.D., Apostolova, L.G., and the LEADS Consortium. (2024) Longitudinal Cognitive Performance of Participants with Sporadic Early Onset Alzheimer's Disease from LEADS. *Alzheimer's & Dementia*. [Link]

10. Hammers, D.B., **Eloyan, A.**, Thangarajah, M., Taurone, A., Polsinelli, A.J., Kirby, K., Dage, J.L., Nudelman, K., Aisen, P., La Joie, R., Lagarde, J., Atri, A., Clark, D., Day, G.S., Duara, R., Graff-Radford, N.R., Honig, L.S., Jones, D.T., Masdeu, J., Mendez, M., Womack, K., Musiek, E., Onyike, C.U., Riddle, M., Rogalski, E., Salloway, S., Sha, S., Turner, R.S., Wingo, T.S., Wolk, D.A, Carrillo, M.C., Dickerson, B., Rabinovici, G.D., Apostolova, L.G., and the LEADS Consortium. (2024) Differences in Baseline Cognitive Performance Between Participants with Early-Onset and Late-Onset Alzheimer's Disease: Comparison of LEADS and ADNI. *Alzheimer's & Dementia*. [Link]

11. Rex, N.B., Chuck, C.C., Dandapani, H.G., Zhou, H.Y., Yi, T.Y., Collins, S.A., Bai, H.X., **Eloyan, A.**, Jones, R.N., Boxerman, J.L., Girard, T.D., Boukrina, O., and Reznik, M.E., (2024) Neuroimaging Markers of Brain Reserve and Associations with Delirium in Patients with Intracerebral Hemorrhage, *Neurocrit Care*. [Link]

12. **Eloyan, A.**, Thangarajah, M., An, N., Borowski, B.J., Reddy, A.L., Aisen, P., Dage, J.L., Foroud, T., Ghetti, B., Griffin, P., Hammers, D., Iaccarino, L., Jack, C.R., Kirby, K., Kramer, J., Koeppe, R., Kukull, W.A., La Joie, R., Mundada, N.S., Murray, M.E., Nudelman, K., Rumbaugh, M., Soleimani-Meigooni, D.N., Toga, A., Touroutoglou, A., Atri, A., Day, G.S., Duara, R., Graff-Radford, N.R., Honig, L.S., Jones, D.T., Masdeu, J., Mendez, M., Musiek, E., Onyike, C.U., Rogalski, E., Salloway, S., Sha, S., Turner, R.S., Wingo, T.S., Wolk, D.A, Womack, K, Beckett, L., Gao, S., Carrillo, M.C., Rabinovici, G.D., Apostolova, L.G., Dickerson, B., Vemuri, P., and the LEADS Consortium. (2023) Comparison of white matter hyperintensities between early-onset Alzheimer's disease participants and their cognitively normal and early-onset nonAD peers from LEADS. *Alzheimer's & Dementia*. [Link]

13. Hammers, D.B., **Eloyan, A.**, Taurone, A., Thangarajah, M., Beckett, L., Gao, S., Kirby, K., Aisen, P., Dage, J.L., Foroud, T., Griffin, P., Grinberg, L.T., Jack, C.R., Kramer, J., Koeppe, R., Kukull, W.A., Mundada, N.S., La Joie, R., Soleimani-Meigooni, D.N., Iaccarino, L., Murray, M.E., Nudelman, K., Polsinelli, A.J., Rumbaugh, M., Toga, A., Touroutoglou, A., Vemuri, P., Atri, A., Day, G.S., Duara, R., Graff-Radford, N.R., Honig, L.S., Jones, D.T., Masdeu, J., Mendez, M., Womack, K., Musiek, E., Onyike, C.U., Riddle, M., Rogalski, E., Salloway, S., Sha, S., Turner, R.S., Wingo, T.S., Wolk, D.A, Carrillo, M.C., Dickerson, B., Rabinovici, G.D., Apostolova, L.G., and the LEADS Consortium. (2023) Profiling baseline performance on the Longitudinal Early-Onset Alzheimer's Disease Study (LEADS) cohort near the midpoint of data collection. *Alzheimer's & Dementia*. [Link]

14. Nicholson, S., Russo, A., Brewer, K., Bien, H., Tobyne, S.M, **Eloyan, A.**, and Klawiter E.C. (2023) The Effect of Ibudilast on Thalamic Volume in Progressive Multiple Sclerosis. *Multiple Sclerosis Journal*. [Link]

15. Morrison, S., Gatsonis, C., **Eloyan, A.**, and Steingrimsson, J.A. (2023) Survival Analysis using Deep Learning with Medical Imaging. *International Journal of Biostatistics*. [Link]

16. Dage, J.L., **Eloyan, A.**, Thangarajah, M., Hammers, D.B., Fagan, A., Gray, J.D., Schindler, S.E., Snoddy, C., Nudelman, K.N.H., Faber, K.M., Foroud, T., Aisen, P., Griffin, P., Grinberg, L.T., Iaccarino, L., Kirby, K., Kramer, J., Koeppe, R., Kukull, W.A., La Joie, R., Mundada, N.S., Murray, M.E., Rumbaugh, M., Soleimani-Meigooni, D.N., Toga, A., Touroutoglou, A., Vemuri, P., Atri, A., Beckett, L.A., Day, G.S., Graff-Radford, N.R., Duara, R., Honig, L.S., Jones, D.T., Masdeu, J., Mendez, M., Musiek, E., Onyike, C.U., Riddle, M., Rogalski, E., Salloway, S., Sha, S., Turner, R.S., Wingo, T.S., Wolk, D.A, Womack, K.B., Carrillo, M.C., Dickerson, B.C., Rabinovici, G.D., Apostolova, L.G., and the LEADS Consortium. (2023) Cerebrospinal fluid biomarkers in the Longitudinal Early-onset Alzheimer's Disease Study. *Alzheimer's & Dementia*. [Link]

17. Nemes, S., Logan, P.E., Manchella, M.K., Mundada, N.S., La Joie, R., Polsinelli, A.J., Hammers, D.B., Koeppe, R.A., Foroud, T.M., Nudelman, K., **Eloyan, A.**, Iaccarino, L., Dorsant-Ardon, V., Taurone, A., Thangarajah, M., Dage, J.L., Aisen, P., Grinberg, L.T., Jack, C.R., Kramer, J., Kukull, W.A., Murray, M.E., Rumbaugh, M., Soleimani-Meigooni, D.N., Toga, A., Touroutoglou, A., Vemuri, P., Atri, A., Day, G.S., Duara, R., Graff-Radford, N.R., Honig, L.S., Jones, D.T., Masdeu, J., Mendez, M., Musiek, E., Onyike, C.U., Riddle, M., Rogalski, E., Salloway, S., Sha, S., Turner, R.S., Wingo, T.S., Womack, K.B., Wolk, D.A, Rabinovici, G.D., Carrillo, M.C., Dickerson, B., Apostolova, L.G., and the LEADS Consortium. (2023) Sex and APOE-ϵ4 carrier effects on atrophy, amyloid PET, and tau PET burden in early-onset Alzheimer's disease. *Alzheimer's & Dementia*. [Link]

18. Hammers, D.B., Nemes, S., Diedrich, R., **Eloyan, A.**, Kirby, K., Aisen, P., Kramer, J., Nudelman, K., Foroud, T., Rumbaugh, M., Atri, A., Day, G.S., Duara, R., Graff-Radford, N.R., Honig, L.S., Jones, D.T., Masdeu, J., Mendez, M., Musiek, E., Onyike, C.U., Riddle, M., Rogalski, E., Salloway, S., Sha, S., Turner, R.S., Weintraub, S., Wingo, T.S., Wolk, D.A, Wong, B., Carrillo, M.C., Dickerson, B., Rabinovici, G.D., Apostolova, L.G., and the LEADS Consortium. (2023) Learning slopes in early-onset Alzheimer's disease. *Alzheimer's and Dementia*. [Link]

19. Polsinelli, A.J., Wonderlin, R.J., Hammers, D.B., Garcia, A.P., **Eloyan, A.**, Taurone, A., Thangarajah, M., Beckett,L., Gao, S., Wang, S., Kirby, K., Logan, P.E., Aisen, P., Dage, J.L., Foroud, T., Griffin, P., Iaccarino, L., Kramer, J., Koeppe, R., Kukull, La Joie, R., Mundada, N.S., W.A., Murray, M.E., Nudelman, K., Soleimani-Meigooni, D.N., Rumbaugh, M., Toga, A., Touroutoglou, A., Vemuri, P., Atri, A., Day, G.S., Duara, R., Graff-Radford, N.R., Honig, L.S., Jones, D.T., Masdeu, J., Mendez, M., Womack, K., Musiek, E., Onyike, C.U., Riddle, M., Rogalski, E., Salloway, S., Sha, S., Turner, R.S., Wingo, T.S., Wolk, D.A, Carrillo, M.C., Dickerson, B., Rabinovici, G.D., Apostolova, L.G., and the LEADS Consortium. (2023) Baseline neuropsychiatric symptoms and psychotropic medication use midway through data collection of the Longitudinal Early-Onset Alzheimer's Disease Study (LEADS) cohort. *Alzheimer's & Dementia*. [Link]

20. Bushnell, J., Hammers, D.B., Aisen, P., Dage, J.L., **Eloyan, A.**, Foroud, T., Grinberg, L.T., Iaccarino, L., Jack, C.R., Kirby, K.,Kramer, J., Koeppe, R., Kukull, W.A., La Joie, R., Mundada, N.S., Murray, M.E., Nudelman, K., Rumbaugh, M., Soleimani-Meigooni, D.N., Toga, A., Touroutoglou, A., Vemuri, P., Atri, A., Day, G.S., Duara, R., Graff-Radford, N.R., Honig, L.S., Jones, D.T., Masdeu, J., Mendez, M., Musiek, E., Onyike, C.U., Riddle, M., Rogalski, E., Salloway, S., Sha, S., Turner, R.S., Wingo, T.S., Wolk, D.A, Carrillo, M.C., Dickerson, B., Rabinovici, G.D., Apostolova, L.G., Clark, D.G., and the LEADS Consortium. (2023) Influence of amyloid and diagnostic syndrome on non-traditional memory scores in early-onset Alzheimer's disease. *Alzheimer's & Dementia*. [Link]

21. Cho, H., Mundada, N.S., Apostolova, L.G., Carrillo, M.C., Shankar., R., Amuiri, A.N., Zeltzer, E., Windon, C.C., Soleimani-Meigooni, D.N., Tanner, J.A., Heath, C.L., Lesman-Segev, O.H., Aisen, P., **Eloyan, A.**, Lee. H.S., Hammers, D.B., Kirby, K., Dage, J.L., Fagan, A., Foroud, T., Grinberg, L.T., Jack, C.R., Kramer, J., Kukull, W.A., Murray, M.E., Nudelman, K., Toga, A., Vemuri, P., Atri, A., Day, G.S., Duara, R., Graff-Radford, N.R., Honig, L.S., Jones, D.T., Masdeu, J., Mendez, M., Musiek, E., Onyike, C.U., Riddle, M., Rogalski, E., Salloway, S., Sha, S., Turner, R.S., Wingo, T.S., Wolk, D.A, Koeppe, R., Iaccarino, L., Dickerson, B., Rabinovici, G.D., and the LEADS Consortium. (2023) Amyloid and tau-PET in early-onset AD: Baseline data from the Longitudinal Early-onset Alzheimer's Disease Study (LEADS). *Alzheimer's & Dementia*. [Link]

22. Touroutoglou, A., Katsumi, Y., Brickhouse, M., Zaitsev, A., Eckbo, R., Aisen, P., Beckett, L., Dage, J.L., **Eloyan, A.**, Foroud, T., Ghetti, B., Griffin, P., Hammers, D., Jack, C.R., Kramer, J., Iaccarino, L., La Joie, R., Mundada, N.S., Koeppe, R., Kukull, W.A., Murray, M.E., Nudelman, K., Polsinelli, A.J., Rumbaugh, M., Soleimani-Meigooni, D.N., Toga, A., Vemuri, P., Atri, A., Day, G.S., Duara, R., Graff-Radford, N.R., Honig, L.S., Jones, D.T., Masdeu, J., Mendez, M., Musiek, E., Onyike, C.U., Riddle, M., Rogalski, E., Salloway, S., Sha, S., Turner, R.S., Wingo, T.S., Wolk, D.A, Womack, K., Carrillo, M.C., Rabinovici, G.D., Apostolova, L.G., Dickerson, B., and the LEADS Consortium. (2023). The Sporadic Early-Onset Alzheimer's Disease Signature of Atrophy: Preliminary findings from the Longitudinal Early-onset Alzheimer's Disease Study (LEADS) Cohort. *Alzheimer's and Dementia*. [Link]

23. Nudelman, K.N.H., Jackson, T., Rumbaugh, M., **Eloyan, A.**, Abreu, M., Dage, J.L., Snoddy, C., Faber, K.M., Foroud, T., Hammers, D.B., DIAN/DIAN-TU Clinical/Genetics Committee, Taurone, A., Thangarajah, M., Aisen, P., Beckett, L., Kramer, J., Koeppe, R., Kukull, W.A., Murray, M.E., Toga, A.W., Vemuri, P., Atri, A., Day, G.S., Duara, R., Graff-Radford, N.R., Honig, L.S., Jones, D.T., Masdeu, J., Mendez, M., Musiek, E., Onyike, C.U., Riddle, M., Rogalski, E., Salloway, S., Sha, S., Turner, R.S., Wingo, T.S., Wolk, D.A, Carrillo, M.C., Dickerson, B., Rabinovici, G.D., Apostolova, L.G., and the LEADS Consortium. (2023). Pathogenic Variants in the Longitudinal Early-Onset Alzheimer's Disease Study Cohort. *Alzheimer's and Dementia*. [Link]

24. **Hu, M.***, Crainiceanu, C.M., Shinohara, R.T., and **Eloyan, A.**$^{+}$ (2022) Matrix Decomposition for Modeling Lesion Development Processes in Multiple Sclerosis. *Biostatistics*. [Link]

25. **Meng, K.*** and **Eloyan, A.**$^+$ (2021) Principal Manifolds: A Framework Using Sobolev Spaces and Model Complexity Selection Using Mixture Densities. *Journal of Royal Statistical Society - Series B.* 83, 2, 369-394. [ArXiv Link] [Link]

26. Apostolova, L.G., Aisen, P., Antonopoulos, G., **Eloyan, A.**, Fagan, A., Fargo, K., Foroud, T., Gatsonis, C., Jack, C., Kramer, J., Koeppe, R., Toga, A., Vemuri, P., Trullinger, A., Iaccarino, L., Day, G., Graff-Radford, N., Honig, L., Jones, D., Masdeu, J., Mendez, M., Musiek, E., Onyike, C., Rogalski, E., Salloway, S., Wolk, D., Wingo, T.S., Carrillo, M.C., Dickerson, B., Rabinovici, G.D., the LEADS Consortium. (2021) The Longitudinal Early-onset Alzheimer's Disease Study (LEADS): Framework and Methodology *Alzheimer's and Dementia.* [Link]

27. **Eloyan, A.** Yue, M.S., Khachatryan, D. (2020) Statistical Analysis of Tumor Heterogeneity for Radiomics in Cancer. *Statistics in Medicine.* 39: 4704–4723. [Link]

28. Keller, J., L., **Eloyan, A.**, Raymond, G., V., Fatemi, A.,Zackowski, K.M. (2021) Sensorimotor outcomes in x-linked adrenoleukodsytrophy show significant disease progression. *Journal of Inherited Metabolic Disease.*

29. **Hu, M.***, Schindler, M.K., Dewey, B.E., Reich, D.S., Shinohara, R.T., and **Eloyan, A.**$^+$ (2020) Experimental Design and Sample Size Considerations in Longitudinal MRI Based Biomarker Detection for Multiple Sclerosis. *Statistical Methods in Medical Research.* 29, 9, 2617–2628. [Link]
- Winner of the Best Student Paper Award at the Statistical Methods in Imaging Conference, 2017.

30. Fritz, N.E., Edwards, E., Keller, J., **Eloyan, A.**, Calabresi, P.A., and Zackowski, K.M. (2020) Combining magnetization transfer ratio MRI and quantitative measures of walking improves the identification of fallers in MS. *Brain Sciences.*

31. Huang, S.Y., Fan, Q., Machado, N., **Eloyan, A.** Bireley, J.D., Russo, A.W., Tobyne, S.M., Patel, K.R., Nummenmaa, A., Witzel, T., Sherman, J.C., Wald, L.L., Klawiter, E.C. (2019) Corpus callosum axon diameter relates to cognitive impairment in multiple sclerosis. *Annals of Clinical and Translational Neurology.* 6, 5, 882-892. [Link]

32. Fritz, N.E., **Eloyan, A.**, Al-Louzi, O., Costello, G., Chen, M., Calabresi, P.A., and Zackowski, K.M. (2019) Quantitative Vibratory Sensation Measurement is Indicative of Sensory Cortical Thickness in MS. *Annals of Clinical and Translational Neurology.* 6, 3, 586-595. [Link]

33. Fritz, N.E., **Eloyan, A.**, Baynes, M., Newsome, S., Calabresi, P.A., and Zackowski, K.M. (2018) Distinguishing among Multiple Sclerosis Fallers, Near-Fallers and Non-Fallers. *Multiple Sclerosis and Related Disorders.* 19, 99-104. [Link]

34. Mejia, A.F., Nebel, M.B., **Eloyan, A.**, Caffo, B.S., and Lindquist, A.M. (2017) PCA leverage: outlier detection for high-dimensional functional magnetic resonance imaging data. *Biostatistics.* 18, 3, 521-536. [Link]

35. Chen, S., Huang, L., Qui, H., Nebel, M.B., Mostofsky, S.M., Pekar, J.J., Lindquist, M.A., **Eloyan, A.**, and Caffo, B.S. (2017) Parallel group independent component analysis for massive fMRI data sets. *PLoS One.* 12, 3. [Link]

36. McKenzie, E.D., Lim, A.S.P., Leung, E.C.W., Cole, A.J., Lam, A.D., **Eloyan, A.**, Nirola, D.K., Tshering, L., et al. (2017) Validation of a Smartphone-based EEG Among People with Epilepsy: A Prospective Study. *Scientific Reports.* [Link]

37. **Sweeney, E.M.***, Shinohara, R.T., Dewey, B.E., Schindler, M.K., Muschelli, J.M., Reich, D.S., Crainiceanu, C.M., and **Eloyan, A.**$^+$ (2016) Relating multi-sequence longitudinal intensity profiles and clinical covariates in new multiple sclerosis lesions. *NeuroImage: Clinical.* 10, 1-17. [Link]

38. Nebel, M.B., **Eloyan, A.**, Nettles, C., Ament, K., Sweeney, K., Ward, R., Barber, A.D., Choe. A., Pekar, J.J., and Mostofsky, S.H. (2016) Intrinsic Visual-Motor Synchrony Correlates With Social Deficits in Autism. *Biological Psychiatry.* 79, 8, 633-641. [Link]

39. Cervenka, M.C, Patton, K., **Eloyan, A.**, Henry, B., and Kossoff, E.H. (2016) The impact of the modified Atkins diet on lipid profiles in adults with epilepsy. *Nutritional Neuroscience.* 19, 3, 131-137. [Link]

40. Muschelli, J., Ullman, N.L., Sweeney, E.M., **Eloyan, A.**, Martin, N., Vespa, P., Awad, I., Hanley, D.F., Crainiceanu, C.M. (2015) Quantitative Localization and Predictive Performance of Intracranial Hemorrhage. *Stroke.* 46, 11, 3270-3273. [Link]

41. Fritz, N.E., Newsome, S., **Eloyan, A.**, Marasigan, R.E.R., Calabresi, P.A., and Zackowski, K.M. (2015) Longitudinal relationships among posturography and gait measures in multiple sclerosis. *Neurology.* 84, 20, 2048-2056. [Link]

42. **Eloyan, A.**, Shou, H., Shinohara, R.T., Sweeney, E.M., Nebel, M.B., Cuzzocreo, J.L., Calabresi, P.A., Reich, D.S., Lindquist, M.A., and Crainiceanu, C.M. (2014) Health effects of lesion localization in multiple sclerosis: Spatial registration and confounding adjustment. *PLoS One.* 9, 9. [Link]

43. Shou, H., **Eloyan, A.**, Nebel, M.B., Pekar, J.J., Mejia, A., Mostofsky, S.H., Caffo, B.S., Lindquist, M.A., and Crainiceanu, C.M. (2014) Shrinkage prediction of seed-voxel brain connectivity using resting state fMRI. *NeuroImage.* 102, 2, 938-944. [Link]

44. Nebel, M.B., **Eloyan, A.**, Barber, A.D., and Mostofsky, S.H. (2014) Precentral gyrus functional connectivity signatures of autism. *Frontiers in Systems Neuroscience.* 8, 80. [Link]

45. **Eloyan, A.**, Li, S., Muschelli, J., Pekar, J.J., Mostofsky, S.H., and Caffo, B.S. (2014) Analytic programming with fMRI data: a quick-start guide for statisticians using R. *PLoS One.* 9, 2. [Link]

46. Risk, B.B., Matteson, D.S., Ruppert, D., **Eloyan, A.**, and Caffo, B.S. (2014) An evaluation of independent component analyses with an application to resting-state fMRI. *Biometrics.* 70, 1, 224-236. [Link]

47. **Eloyan, A.**, Crainiceanu, C.M., and Caffo, B.S. (2013) Likelihood based population independent component analysis. *Biostatistics.* 14, 3, 514-527. [Link]

48. Shou, H., **Eloyan, A.**, Lee, S., Zipunnikov, V., Crainiceanu, A.N., Nebel, M.B, Caffo, B.S., Lindquist, M.A., and Crainiceanu, C.M. (2013) Quantifying the reliability of image replication studies: The image intraclass correlation coefficient (I2C2). *Cognitive, Affective, and Behavioral Neuroscience.* 13, 714-724. [Link]

49. **Eloyan, A.** and Ghosh, S.K. (2013) A semiparametric approach to source separation using independent component analysis. *Computational Statistics and Data Analysis.* 58, 383-396. [Link]

50. Cervenka, M.C., Corines, J., Boatman-Reich, D., **Eloyan, A.**, Sheng, X., Franaszczuk, P.J., and Crone, N.E. (2012) Electrocorticographic functional mapping identifies human cortex critical for auditory and visual naming. *NeuroImage.* 69, 267-276. [Link]

51. Li, S., **Eloyan, A.**, Joel, S., Mostofsky S.H., Pekar, J.J., Basset, S.S., and Caffo, B.S. (2012) Analysis of group ICA-based connectivity measures from fMRI: application to Alzheimer's Disease. *PLoS One.* 7, 11. [Link]

52. **Eloyan, A.**, Muschelli, J., Nebel, M.B., Liu, H., Han, F., Zhao, T., Barber, A.D., Joel, S., Pekar, J.J., Mostofsky, S.H., and Caffo, B.S. (2012) Automated diagnoses of attention deficit hyperactive disorder using magnetic resonance imaging. *Frontiers in Systems Neuroscience.* 6, 61. [Link]
- Invited submission. Based on the winning entry of the ADHD 200 Prediction Competition.

53. **Eloyan, A.** and Ghosh, S.K. (2011) Smooth density estimation with moment constraints using mixture distributions. *Journal of Nonparametric Statistics.* 23, 2, 513-531. [Link]

54. Hakopian, Y.R. and **Eloyan, A.N.** (2007) The Moore-Penrose inverse of block magic rectangles. *International Journal of Mathematical Education in Science and Technology.* 38, 8, 1093-1102. [Link]

55. Hakopian, Y.R., **Eloyan, A.N.**, and Khachatryan, D.E. (2006) About magic rectangles. *International Journal of Mathematical Education in Science and Technology.* 37, 4/15, 475-483. [Link]

Commentaries

1. **Eloyan, A.** and Rose, S. (2021) Considerations across three cultures: Parametric regression, interpretable algorithms, and complex algorithms. *Observational Studies.*

Book Chapters and Encyclopedia Entries

1. Caffo, B.S., Zhao, Y., **Eloyan, A.**, Wang, Z., Mejia, A.F., and Lindquist, A.M. (2018) A Survey of Statistics in the Neurological Sciences with a Focus on Human Neuroimaging. *Wiley StatsRef: Statistics Reference Online.*

2. **Eloyan, A.**, Zipunnikov, V., Yang, J., and Caffo, B.S. Multivariate Decompositions in Brain Imaging. *Handbook of Modern Statistical Methods: Neuroimaging Data Analysis.* CRC Press, 2016.

3. Crainiceanu, C.M., Sweeney, E.M., **Eloyan, A.**, and Shinohara, R.T. A Tutorial for Multisequence Clinical Structural Brain MRI. *Handbook of Modern Statistical Methods: Neuroimaging Data Analysis.* CRC Press, 2016.

Funding

R01 AG075511 (PI Eloyan) 09/01/2022 – 05/31/2027
NIA/Brown
High-dimensional Modeling of PET for Radiomic Biomarker Discovery
Identification of positron emission tomography (PET) imaging biomarkers for patients with Alzheimer's disease (AD) that describe brain changes over time is crucial for treatment clinical trials and observational studies of AD. We propose to develop rigorous statistical methods for analyzing multi-modality, high-dimensional longitudinal PET and MRI imaging data for biomarker discovery.
Role: Principal Investigator

U01 AG057195 (PI Apostolova) 09/15/17 - 08/31/24 2.5 academic
NIH/IU $164,814 .50 summer
Early Onset Alzheimer's Disease Consortium To fill this gap in AD research, we plan to recruit and longitudinally follow 400 amyloid PET-positive EOAD subjects meeting NIA-AA criteria for MCI due to AD or probable AD dementia (including primary amnestic, dysexecutive, language and visuospatial presentations) and 100 age-matched controls. Participants will undergo clinical assessments, psychometric testing, MRI, amyloid ([18F]Florbetaben) and tau ([18F]AV1451) PET, CSF and blood draw for collection of DNA, RNA, plasma, serum and peripheral blood mononuclear cells (PBMC). Patients will be assessed at three time points at baseline (both EOAD and controls), 12 months (EOAD only, all measures) and 24 months (EOAD, all measures except PET). Methods will be harmonized with ADNI and DIAN. We will comprehensively characterize cognitive, imaging and biofluid changes over time in EOAD, and compare to a matched sample of LOAD participants identified in ADNI. We will employ machine learning algorithms to develop sensitive clinical and imaging measures of EOAD progression.
Role: Biostatistics Core Lead

R01 AG083919 (PI Mejia) 08/15/2024 – 04/30/2029
NIA/IU
Individual functional brain mapping for biomarker discovery in Alzheimer's No fMRI-based biomarker for AD exists to date. This is in part due to the high noise levels of fMRI and the common use of naive statistical methods, which together lead to noisy estimates of FC and other functional brain features. Two conventional workarounds—averaging many subjects or collecting hours of data on individual subjects—are not viable clinically. This project will address this gap by developing computationally efficient Bayesian techniques with high accuracy and deploying those methods for fMRI-based biomarker discovery in AD. Our models leverage information across subjects via population-derived priors or "templates", which are previously estimated, to extract nuanced and precise functional brain features in individuals. These models avoid the need for burdensome prolonged scans. They can be fit to data from a single subject at a time, making them clinically viable and computationally advantageous. To maximize the benefits of hierarchical modeling, we utilize grayordinates data, a recent technological advance in image processing that improves inter-subject anatomical alignment. To deploy these techniques effectively in multi-site datasets like the ADNI, image harmonization is necessary to avoid confounding site effects. Existing harmonization methods can be applied to fMRI summary measures, but are not applicable to fMRI time series, which are a complex mixture of latent features. To address this critical gap, we will develop a novel harmonization method for fMRI time series data, with high potential impact on fMRI processing pipelines. Finally, we will analyze fMRI data from ADNI to extract functional brain features and build novel fMRI-based AD biomarkers. While our focus is AD, this project will have broad implications for fMRI-based research and care.
Role: Co-Investigator

P20 GM103645 (PI Sanes) 08/15/18-07/31/24 5.0 academic
NIGMS/Brown University $185,000 1.0 summer
COBRE Center for Central Nervous System Function Quantitative Methods for Brain Connectivity Network Estimation & Inference in Functional Magnetic Resonance Imaging To develop a unified statistical framework for relating static and dynamic functional and effective brain connectivity maps with clinical and more complex variables of interest such as genetics or integrated imaging in other modalities (such as EEG or structural imaging) for population inference.
Role: Mentor for Project Leader Dr. Lee and Co-Investigator in the BNC core

FUNDING COMPLETED

P20 GM103645 (PI Sanes) 08/15/18-07/31/23 5.0 academic
NIGMS/Brown University $185,000 1.0 summer
COBRE Center for Central Nervous System Function Quantitative Methods for Brain Connectivity Network Estimation & Inference in Functional Magnetic Resonance Imaging To develop a unified statistical framework for relating static and dynamic functional and effective brain connectivity maps with clinical and more complex variables of interest such as genetics or integrated imaging in other modalities (such as EEG or structural imaging) for population inference.
Role: Project Leader

(PI Klawiter) 07/01/18-06/30/21 1.5 academic
DoD $28,966 .30 summer
Regional Atrophy as a Biological Correlate of MS Progression This application proposes to develop effective treatments for progressive forms of multiple sclerosis (MS). The project will pursue the following aims: Improve automated techniques for evaluation of volumetric measures in the thalamus and cerebellum. Correlate changes in regional atrophy measures in progressive MS with progression of disability and progression of cognitive dysfunction. Evaluate treatment effect on changes in regional atrophy in the corpus callosum, thalamus, medulla and cerebellum compared to global atrophy measures.
Role: Subcontract PI

R21 NS093349 (PI Shinohara/Eloyan) 05/15/16 - 04/30/18 .30 academic
NINDS/UPenn $62,279 .06 summer
Spatiotemporal Modeling of MRI Brain Lesion Trajectories for Biomarker Discovery
We propose to develop statistical methods for the analysis of longitudinal magnetic resonance imaging (MRI) data for patients with multiple sclerosis (MS). Disease biomarkers identified from MRI are necessary for studying disease progression in observational studies and for assessing treatment effects of therapies in clinical trials. We propose statistical methods for the analysis of longitudinal MRI intensity time courses that integrate information across multiple modalities. The proposed methods will harness the complex data structure of clinical MRI for identifying biomarkers that can be utilized in future studies and that are implementable in MS centers across the country.
Role: co-Principal Investigator

5P20 GM103645 (PI Sanes) 08/15/13-07/31/18 2.0 academic
NIGMS/Brown University $110,598 .40 summer
COBRE Center for Central Nervous System Function
Purposeful human behavior requires attention, decisions and action, all basic functions mediated by brain networks primarily located in the neocortex, but modulated and shaped by sub-cortical processing. Behavioral and brain mechanisms of attention, including vigilance, orienting and perceptual and action selection, are key gateways into high-level function. Thus, in a general and even specific sense, attention, decision making and the ensuing actions define human mental activities. Deficits in these functions are common in both neurological and psychiatric disorders and can result in a wide range of higher-order behavioral deficits. We propose to establish a COBRE Center for Central Nervous System Function at Brown University that will investigate the mechanisms of higher brain function, with a focus on attention, decision making and action and disorders that modify these key systems, using a combination of genetic, behavior, and systems neuroscience approaches.
Role: Core B Co-I

Invited Presentations

1. Manifold Learning for estimation of Imaging Biomarkers in Alzheimer's Disease, FDAWG meeting, Columbia University, NYC, NY, November, 2024.

2. Imaging and Clinical Biomarker Estimation in Early Onset Alzheimer's Disease, Department of Biostatistics, Yale University, New Heaven, CT, October, 2024.

3. Imaging and Clinical Biomarker Estimation in Early Onset Alzheimer's Disease, Biostatistics Seminar, NYU Grossman School of Medicine, NYC, NY, October, 2024.

4. Longitudinal Manifold Learning for Modeling Shapes in Alzheimer's Disease, Challenges in Neuroimaging Data Analysis, Chicago, IL, August, 2024.

5. Biostatistics Core updates. LEADS IM, Philadelphia, PA, July, 2024.

6. Manifold Learning for Modeling Shapes in Alzheimer's Disease, ENAR, Baltimore, MD, March, 2024.

7. Imaging and Clinical Biomarker Estimation in Alzheimer's Disease, Department of Statistics, McGill University, January, 2024.

8. Biostatistics Core updates. LEADS IM, Amsterdam, the Netherlands, July 2023.

9. Manifold Learning for Modeling Shapes in Alzheimer's Disease, NESS, Boston, MA, June 2023.

10. Imaging and Clinical Biomarker Estimation in Alzheimer's Disease, Department of Statistics and Applied Mathematics, University of Massachusetts, Amherst, MA, May, 2023.

11. Imaging and Clinical Biomarker Estimation in Alzheimer's Disease, Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, November, 2022.

12. Imaging and Clinical Biomarker Estimation in Alzheimer's Disease, Chair's invited seminar, Department of Biostatistics, Brown University, Providence, RI, September 2022.

13. Considerations Across Three Cultures: Parametric Regressions, Interpretable Algorithms, and Complex Algorithms, JSM, Washington, DC, August 2022.

14. Biostatistics Core updates. LEADS IM, San Diego, CA, August 2022.

15. Comparison of white matter hyperintensities between early-onset Alzheimer's disease participants and their cognitively normal and early-onset nonAD peers from LEADS, Alzheimer's Association International Conference, San Diego, CA, July 2022. (poster)

16. Graph Theoretic Modeling of Brain Functional Connectivity, NESS, Storrs, CT, May 2022.

17. Manifold learning in medical image analysis, Department of Biostatistics, Boston University, Boston, MA, April 2022.

18. Graph Theoretic Modeling of Brain Functional Connectivity, CMStatistics Conference, London, UK, December 2021.

19. Presenter at Stanford AI + Health Online Conference, Virtual conference, December 2021.

20. Radiomics for feature extraction from radiological images, Department of Statistical Science, Southern Methodist University, Virtual seminar, November 2021.

21. Analysis of structural imaging data in cancer, Statistical Methods in Imaging, Virtual conference, May 2021.

22. Biostatistics Core updates. LEADS IM, Virtual meeting, May 2021.

23. Radiomics for feature extraction from radiological images, PenSIVE group, University of Pennsylvania, Philadelphia, PA, January 2021.

24. Radiomics for feature extraction from radiological images, Division of Biostatistics, The Department of Population Health, New York University, NY, December 2020.

25. Role of Postdocs in Statistics, Panelist, Women in Statistics and Data Science, Virtual Conference, October, 2020.

26. Graph Theoretic Modeling of Brain Functional Connectivity, JSM, Virtual conference, August, 2020.

27. Biostatistics Core updates. LEADS IM, Virtual meeting, April 2020.

28. Estimation of Tumor Heterogeneity for Radiomics in Cancer, Department of Biostatistics and Department of Biomedical Informatics, B3D Seminar Series, Harvard University, MA, April 2019.

29. Biostatistics Core updates. LEADS IM, Philadelphia, PA, May 2019.

30. Brain Functional Connectivity Using Covariance Regression. ENAR, Philadelphia, PA, March 2019.

31. Biostatistics Core updates. LEADS IM, Boston, MA, May 2018.

32. Structural image analysis for improved prediction of patient outcomes. JSM, Baltimore, MD, August 2017.

33. Estimation and prediction in connectivity analysis. Statistical Methods in Imaging, Pittsburg, PA, May 2017.

34. Biomarker development using structural imaging in multiple sclerosis. Challenges and Advances on Big Data in Neuroimaging, Cleveland Clinic, Cleveland, OH, August 2016.

35. Statistical issues in pre-processing and group modeling of magnetic resonance image data for neurodegenerative diseases. International Biometric Conference, Victoria, Canada, July 2016.

36. Functional Connectivity in Autism via Independent Component Analysis. NESS, New Haven, CT, April 2016.

37. Statistical analysis of brain images using matrix decompositions. Challenges in Functional Connectivity Modeling and Analysis Workshop, SAMSI, NC, April 2016.

38. Statistical analysis of brain images using matrix decompositions. Department of Biostatistics, University of Minnesota, MN, November 2015.

39. Non-standard measurements in electronic medical records. ICHPS, Providence, RI, October, 2015.

40. Implications of matrix decomposition methods in analyzing imaging data. JSM, Seattle, WA, August, 2015. (Topic Contributed)

41. Matrix decompositions in statistical analysis of brain images, Department of Biostatistics, Emory University, Atlanta, GA, April 2015.

42. A Bayesian approach for matrix decompositions in neuroimaging, Bayesian Working Group, Department of Biostatistics, Harvard University, Boston, MA, March, 2015.

43. Matrix decompositions in statistical analysis of brain images, Department of Biostatistics, Brown University, Providence, RI, February, 2015.

44. Matrix decomposition methods for functional MRI data, Neurostatistics Working Group, Department of Biostatistics, Harvard University, Boston, MA, November, 2014.

45. On Incorporating Imaging Data in Medical Records Analyses, Department of Health Care Policy, Harvard Medical School, Boston, MA, November, 2014.

46. Sex differences in physical recovery after heart surgery: a minute-by-minute-by-year approach, GSA, Washington, DC, November 2014.

47. Visual-motor connectivity in Autism via ICA, Department of Biostatistics Grand Rounds, Johns Hopkins University, November, 2014.

48. Statistical Analysis of High Dimensional Neuroimaging Data, Biostatistics Division, Department of Child and Adolescent Psychiatry, New York University, NYC, NY, October, 2014.

49. Matrix decompositions with applications in Neuroimaging, PenSIVE group, University of Pennsylvania, Philadelphia, PA, September, 2014.

50. Challenges in statistical analysis of high-dimensional brain imaging data, JSM, Boston, MA, August, 2014. (Topic Contributed)

51. Statistical Analysis of Imaging Data for Disease Exploration, WNAR, Honolulu, HI, June, 2014.

52. The use of wearable technology for comparative effectiveness research, NESS, Boston, MA, April, 2014.

53. Statistical Analysis of High Dimensional Neuroimaging Data, Department of Statistics, University of Virginia, Charlottesville, VA, April, 2014.

54. Matrix decomposition methods for functional MRI data. JSM, Montreal, Quebec, Canada, August, 2013. (Topic Contributed)

55. Bayesian approaches for decompositions of neuroimaging data. ENAR, Orlando, FL, March, 2013.

56. Likelihood based population independent component analysis. Department of Biostatistics, University of Pennsylvania, Philadelphia, PA, February, 2013.

57. Likelihood based population independent component analysis. Department of Biostatistics, Johns Hopkins University, Baltimore, MD, February, 2013.

58. Likelihood based population independent component analysis. Department of Biostatistics, George Washington University, Washington, DC, February, 2013.

59. Likelihood based population independent component analysis. Department of Biostatistics, University of Massachusetts, Amherst, MA, January, 2013.

60. Likelihood based population independent component analysis. Department of Statistics, Texas A&M University, College Station, TX, January, 2013.

61. Likelihood based population independent component analysis. ENAR, Washington, DC, April, 2012. (Topic Contributed)

62. Prediction methods for ADHD 200 competition. Frontiers in Addiction Research, Washington, DC, November, 2011. (Poster)

63. Independent component analysis, application to EEG. Regional EEG/ERP Research Meeting, Baltimore, MD, April, 2011.

Contributed Talks, Posters

1. Likelihood Based Population Independent Component Analysis, Hopkins Imaging Initiative, Baltimore, MD, October, 2011. (Poster)

2. Bayesian Independent Component Analysis for fMRI Data, ENAR, Miami, FL, March, 2011. (Poster)

3. Semiparametric Approaches to Separation of Sources Using Independent Component Analysis, ENAR, New Orleans, LA, March, 2010.

4. Bayesian Independent Component Analysis Using Mixture Priors, JSM, Washington DC, August, 2009.

5. Smooth Density Estimation with Moment Constraints Using Mixture Distributions, ENAR, San Antonio, TX, March, 2009.

Advising

Advisees

Robert Zielinski, PhD candidate (thesis advisor)
Liangkang Wang, PhD candidate (thesis advisor)
Daniel Posmik, PhD candidate (thesis advisor)
Haiyue Song, PhD candidate (thesis advisor)
Kaizong Mu, MS candidate (thesis advisor)
Yuqin Wang, MS candidate (thesis advisor)

Former Advisees, PhD

Yimo Zhang, PhD candidate (thesis advisor), position after graduation - Senior Biostatistician at Tigermed
Kun Meng, PhD (thesis advisor), position after graduation - Prager Assistant Professor of Applied Mathematics at Brown University
Ruotao Zhang, PhD (dissertation committee member, Brown)
Menghan Hu, PhD (thesis advisor), position after graduation - Sage Therapeutics
Xiaoyu Wei, PhD (dissertation committee member, Brown)
Bing Li, PhD (dissertation committee member, Brown)
Kevin Wu, PhD (dissertation committee member, Brown)
Jun Ke, PhD (dissertation committee member, Brown)
Junrui Di, PhD (academic advisor, JHU)

Former Advisees, MS

Anusha Kumar, ScM (project advisor)
Gary Zhou, ScM (project co-advisor)
Yifan Zhao, ScM (thesis advisor)

Joanna Walsh, ScM (thesis advisor, Brown)
Yue Yu, MS (thesis advisor, Brown)
Camilla Calmasini, ScM (thesis advisor, Brown)
Kun Meng, ScM (thesis advisor, Brown)
Iman Saeed, ScM (academic advisor, Brown)
James Pringle, ScM (thesis reader, primary advisor Ciprian Crainiceanu, JHU)

Teaching Experience

Instructor

1. PHP2515: Fundamentals of Probability and Statistical Inference (Brown - Fall 2019).
2. PHP2514: Applied Generalized Linear Models (Brown - Spring 2019, 2020, Fall 2020).
3. PHP2510: Principles of Biostatistics and Data Analysis (Brown - Fall 2018).
4. PHP2605: Generalized Linear Models (Brown - Spring 2017, 2021, 2022, 2023, 2024).
5. PHP2601: Linear Models (Brown - Fall 2015, 2016, 2023, 2024).
6. PHP2650: Statistical Learning and Big Data (Brown - Spring 2025).
7. Advanced Methods in Biostatistics (JHU - Spring 2015):

   Developed and taught a discussion section for the course on the algorithms and implementations for biostatistical methods including the EM algorithm, MCMC, sampling.

8. Advanced Special Topics in Biostatistics (JHU - Spring 2014):

   Matrix Decompositions and Prediction, Applications in Neuroimaging,
   Developed the course on the use of matrix decompositions and machine learning algorithms in neuroimaging data analysis.
9. Introduction to Statistics (NCSU - Summer 2007, Fall 2007, Spring 2008).

Guest Lecturer

Public Health Biostatistics (JHU - Fall 2014).

Lab Instructor

Statistical Methods in Public Health III (JHU - Spring 2012),
Statistical Methods in Public Health I (JHU - Fall 2012),
Experimental Statistics for Biological Sciences (NCSU - Fall 2006, Spring 2007),
Business Statistics (NCSU - Fall 2005, Spring 2006).