Rajesh Ranjan Nandy

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EDUCATION

1992: B.Stat. Statistics, Indian Statistical Institute, Calcutta, India

1994: M.Stat. Statistics, Indian Statistical Institute, Calcutta, India

2001: Ph.D. Mathematics, Department of Mathematics, University of Washington

OTHER TRAINING

Fall 1997: Official training at workshop on Infinite Dimensional Stochastic Analysis (including Malliavin Calculus, Dirichlet Forms) at Berkeley, California (funded and supported by Mathematical Sciences Research Institute).

Fall 1999-Spring 2001: Ph.D. program in Physics, Department of Physics, University of Washington,

Summer 2001: Summer internship in statistical analysis of neuroimaging data: Specialty in multivariate analysis (canonical correlation), nonparametric methods and programming in S-plus/MATLAB, Department of Radiology, University of Washington.

2001-2005: Post-doctoral training in statistical analysis of neuroimaging data, Department of Radiology, University of Washington.

March 2003: Participated in "The fMRI Experience V" workshop at Kings College, London.

June 2004: Participated in "The FSL workshop" on fMRI at Wurzburg.

Summer 2004: Participated in the "Mathematics in Brain Imaging" workshop at the Institute for Pure and Applied Mathematics at UCLA.

APPOINTMENTS

2015-current: Associate Professor, Departments of Biostatistics, School of Public Health, University of North Texas Health Science Center

2013-2015: Assistant Professor, Departments of Biostatistics, School of Public Health, University of North Texas Health Science Center

2005 – 2013: Assistant Professor, Departments of Biostatistics and Psychology, University of California, Los Angeles.

2001-2005: Senior Fellow, Department of Radiology, University of Washington.

1994-2001: Teaching Assistant and independent Instructor in several Mathematics undergraduate and graduate courses, University of Washington, Seattle.

1997 (summer): Visiting Scholar, Indian Statistical Institute, Calcutta, India.

HONORS AND AWARDS

P. C. Mahalanobis International Symposium on Statistics Gold Medal, Indian Statistical Institute. 1993-94.

Honorary subscription to Sanhkya, the Indian Journal of Statistics. 1994-1995

Human Brain Mapping Travel Award. 2002-2003

International Society for Magnetic Resonance in Medicine Travel Award. 2002-2004.

Broadcast Media

1. **NBC national nightly news** - More retailers impose mask mandates across country

2. **ABC (Australian Broadcasting Corporation) international news** - Coronavirus cases soar in Texas as US enters one of its busiest travel
3. **ABC (Australian Broadcasting Corporation) international news** - Vaccine rollout in USA
4. **KERA NEWS (NPR)** - Report: Tarrant County Social Distancing Measures Have Slowed COVID-19 Spread
5. **ABC 8 DFW (WFAA)** - Tarrant County sees sharp uptick in COVID-19 hospitalizations
6. **ABC 8 DFW (WFAA)** - Study: Mask mandates have been effective in slowing down COVID-19 in Denton, Tarrant, Dallas counties
7. **ABC 8 DFW (WFAA)** - 'Life is not back to normal': Thanksgiving warnings as COVID-19 cases rise
8. **ABC 8 DFW (WFAA)** - Tarrant County Health Director recommends schools return to all-virtual learning
9. **ABC 8 DFW (WFAA)** - Three bowl games scheduled in three days in North Texas as COVID-19 numbers rise
10. **CBS 11 DFW (KTVT)** - Stay-At-Home-Orders Effective In Tarrant County, But Coming Weeks CriticalCBS DFW
11. **CBS 11 DFW (KTVT)** - UNT Researchers: Mask Mandates Helping Slow Spread Of Coronavirus
12. **CBS 11 DFW (KTVT)** - North Texas Researchers Track Data To See If Thanksgiving Holiday Was A COVID-19 Superspreader
13. **CBS 11 DFW (KTVT)** - Texas Health Professionals Keeping An Eye On New Strain Of COVID-19 Now In The US
14. **CBS 11 DFW (KTVT)** - Experts To Look At Next 2 Weeks To See If Residents Heeded Warnings On Thanksgiving Gatherings
15. **FOX 4 DFW (KDFW)** - Tarrant County reports 820 new COVID-19 cases, 2 deaths
16. **FOX 4 DFW (KDFW)** - With 13 new deaths reported Friday, Dallas County reports its deadliest week from COVID-19
17. **FOX 4 DFW (KDFW)** - Mask mandate successfully slowing spread of COVID-19 in North Texas, new report says
18. **FOX 4 DFW (KDFW)** - Dallas County sets daily record for COVID-19 deaths, 36
19. **FOX 4 DFW (KDFW)** - More evidence shows masks continue slowing spread of COVID-19 in North Texas, report says
20. **FOX 4 DFW (KDFW)** - Dallas, Tarrant counties report record high COVID-19 hospitalizations
21. **FOX 4 DFW (KDFW)** - COVID-19 hospitalizations across North Texas region reach 13.96 percent
22. **FOX 4 DFW (KDFW)** - North Texas officials still dealing with backlogged reporting of COVID-19 cases
23. **FOX 4 DFW (KDFW)** - Who will get a COVID-19 vaccine first in North Texas?
24. **FOX 4 DFW (KDFW)** - North Texas health experts warn against indoor gatherings for Super Bowl
25. **NBC 5 DFW (KXAS) -** Stay-At-Home Orders Were Effective, Next Few

Weeks Will Be 'Critical,' Expert Says
26. **NBC 5 DFW (KXAS) -** Tarrant County Adds 732 COVID-19 Cases Thursday, 2 New Deaths
27. **NBC 5 DFW (KXAS) -** Tarrant County Tops 60,000 COVID-19 Cases Tuesday, Adds 6 New Deaths, 500 Cases
28. **NBC 5 DFW (KXAS) -** Tarrant County Adds 633 COVID-19 Cases Wednesday, 1 New Death
29. **NBC 5 DFW (KXAS) -** North Texas Could Reach Herd Immunity by Mid-June, Researchers Say
30. **NBC 5 DFW (KXAS) -** Will Herd Immunity Be Delayed by Drops in COVID-19 Vaccine Registrations?
31. **NBC 5 DFW (KXAS) -** Statisticians Look Toward Second Wave of COVID-19
32. **NBC 5 DFW (KXAS) -** Denton Passes Mask Ordinance as State, Health Experts Monitor COVID-19 Surge
33. **NBC Austin (KXAN)** -University of North Texas study: mask orders help slow spread of COVID-19
34. **KRLD News Radio 1080** - UNT Health Study Shows Face Mask Benefits

Print and Digital Media

1. **The Telegraph UK** - Police knock doors in Texas quarantine drive as US heads for third wave
2. **Wall Street Journal** - Weeks After Texas Reopened, Health Experts Look for Impact
3. **Wall Street Journal** - Memorial Day Covid-19 Data Will Likely Mark Pandemic Milestone
4. **The Daily Beast** - Texas Gov. Moves to Stop COVID-19 but It's Already Out of Control
5. **Dallas Morning News** - We asked 3 Texas doctors: Should you send your kids back to school this fall?
6. **Dallas Morning News** - Experts warned of a second wave of coronavirus cases as reopenings swept Texas in May
7. **Dallas Morning News** - 5-year-old is among latest coronavirus victims as Dallas County again reports case total under 750
8. **Dallas Morning News** - Are masks enough in Dallas-Fort Worth to avoid another shutdown? A new report says yes
9. **Dallas Morning News** - Mask study Gov. Abbott cites as reason for no COVID-19 shutdown has limits, author says
10. **Dallas Morning News** - Report projects Tarrant County COVID-19 hospitalizations could soon outpace Dallas County's
11. **Dallas Morning News** - Uptick in COVID-19 cases forces last-minute cancellation of Plano health fair this weekend

12. **Dallas Morning News** - To avoid 'completely stressed out' hospitals, North Texas should close bars, gyms, report says
13. **Dallas Morning News** - Coronavirus numbers are rising, so is North Texas at the start of a fall COVID-19 surge?
14. **Dallas Morning News** - Richardson ISD schools to remain open amid heightened COVID-19 risk level, superintendent says
15. **Dallas Observer** - New COVID Cases Soar While Deaths Slow, but Don't Celebrate Just Yet
16. **Dallas Observer** - Mask Mandates Are Working to Curb COVID, New Report Shows
17. **Dallas Observer** - Dallas County Will See Spike in COVID-19 Hospitalizations, Public Health Experts Warn
18. **Dallas Observer** - Dallas County Adds 5,000 New COVID-19 Cases to July's Count
19. **Dallas Observer** - High Hospitalization Rates in North Texas May Prompt Greater COVID-19 Restrictions
20. **Dallas Observer** - Cases are Down in North Texas, but Public Health Experts Warn Against Letting Up
21. **Dallas Observer** - Health Experts Cautiously Optimistic Following Decrease in COVID-19 Rates
22. **D Magazine** - For the First Day Since July 3, New Coronavirus Infections Fall Below 1,000
23. **D Magazine** - As Restrictions Lift, DFW is Still Staying HomeD Magazine
24. **Fort Worth Star-Telegram** - Fort Worth area is state's most populated to not require masks. Here's what leaders say
25. **Fort Worth Star-Telegram** - Texas adds more than 8,000 new COVID cases and sees record hospitalizations WednesdayFort Worth Star-Telegram Newspaper and web reportSummer 2020
26. **Fort Worth Star-Telegram** - Here's what swayed Fort Worth and Tarrant County to require COVID-19 masks
27. **Fort Worth Star-Telegram** - Without mask mandate, North Texas COVID 'mini surge' likely to continue, scientist says
28. **Fort Worth Star-Telegram** - Fort Worth, Tarrant County are worse off than Dallas on COVID. Where are our leaders?
29. **Fort Worth Star-Telegram** - Are tougher COVID restrictions needed? Other cities think so, but not Fort Worth area
30. **Fort Worth Star-Telegram** - Restrictions slowed COVID-19 in Fort Worth, but loosening may lead to surge, study finds
31. **Fort Worth Star-Telegram** - Coronavirus cases on the rise in Texas. Public response will determine where it's headed
32. **Fort Worth Star-Telegram** - Fort Worth-area hospitals must add beds soon if COVID cases don't slow, expert warns
33. **Fort Worth Star-Telegram** - As COVID surges, Abbott extends ban on elective surgeries to over 100 Texas counties
34. **Fort Worth Star-Telegram** - After 79 days in hospital fighting COVID, Fort Worth-area woman gets 'second chance'
35. **Fort Worth Star-Telegram** - Tarrant County's mask mandate helped

stabilize growth of new COVID cases, expert says
36. **Fort Worth Star-Telegram** - Tarrant hospitals will be full within 30 days unless we reverse COVID trend, report says
37. **Fort Worth Star-Telegram** - Texas COVID-19 hospitalizations approach record high
38. **Fort Worth Star-Telegram** - Texas doctors await Labor Day, school, flu season with mixed hope and dread amid COVID
39. **Fort Worth Star-Telegram** - Fort Worth has COVID plan for National Finals Rodeo. Experts say infections are likely
40. **Fort Worth Star-Telegram** - Texas' COVID testing has dropped as positivity rate climbs, giving virus 'upper hand'
41. **Fort Worth Star-Telegram** - Health experts 'cautiously optimistic' by Texas' COVID declines. School may change that
42. **Fort Worth Star-Telegram** - As Fort Worth hospitals fill up, public encouraged to celebrate New Year holiday safely
43. **Fort Worth Star-Telegram** - When will North Texas reach COVID-19 herd immunity? Sooner than you might think
44. **Fort Worth Star-Telegram** - Dire COVID predictions about end of mask mandate were way off. Let's be glad for that
45. **Fort Worth Star-Telegram** - North Texas bars must close, restaurants reduce capacity as COVID hospitalizations rise
46. **The Texas Tribune** - Mask mandate appears to be helping in Texas, but experts ask Gov. Greg Abbott not to rule out a shutdown
47. **The Texas Tribune** - Several Texas cities worry hospitals may run out of beds in two weeks or sooner
48. **The Texas Tribune** - The percentage of Texans testing positive for COVID-19 is dropping, but experts say the threat isn't over
49. **The Texas Tribune** - Why Texas' coronavirus data comes with caveats
50. **The Texas Tribune** - Analysis: It's hard to make good pandemic policy if the Texas data is fuzzy
51. **The Texas Tribune** - Texas officials change how the state reports positivity rate after testing backlogs skewed coronavirus data
52. **The Texas Tribune** - Coronavirus cases in Texas are soaring again. But this time Gov. Greg Abbott says no lockdown is coming.
53. **The Texas Tribune** - Five health experts on the state's coronavirus data backlog
54. **The Texas Tribune** - Texas coronavirus hospitalizations are at a two-month low, but school reopenings pose new risks
55. **The Texas Tribune** - Texas leaders hope rapid testing will restore normalcy in the pandemic. Health experts caution the tests have limitations.
56. **The Texas Tribune** - Share of positive COVID-19 cases as Texas reopened was higher than originally reported, new state calculations show

PROFESSIONAL MEMBERSHIP

International Indian Statistical Association

American Statistical Association

Human Brain Mapping Society

International Statistical Institute

TEACHING

Various undergraduate and graduate statistics and mathematics courses: Calculus, Business Mathematics, Probability, Linear Analysis, Longitudinal Data Analysis, Basic Statistics Courses, Design of Experiments, Multivariate Statistics, Statistical Inferences, Bayesian Statistics, Survival Analysis, Biostatistics consulting, Statistical methods for neuroimaging data and Regression.

Courses taught at UNT Health Science Center

Course Number	Title	Term
BIOS 5300	Principles of Biostatistics	Fall 2013, 17, 18, 19
BIOS 6391	Introduction to Applied Bayesian Data Analysis	Spring 2014, Fall 2016, 17, 19
BIOS 5301	Foundations of Biostatistics	Fall 2014, 15
BIOS 6324	Survival Analysis	Fall 2014-17, 2020-22, Spring 2019
BIOS 6320	Biostatistical Research and Consulting	Spring 2015, 16, 17
BIOS 5310	Intermediate Biostatistics	Spring 2021
BIOS 6322	Longitudinal Data Analysis	Spring 2018, 20
BIOS 6310	Statistical Inference	Fall 2018, 19

Ph.D. STUDENT SUPERVISION

Brad Mcevoy, Completed December 2008

Title of Dissertation: *Stochastic Bayesian Variable Selection in fMRI.*

Dr. Mcevoy is currently a Statistical Reviewer at the Office of Biostatistics (OB), Center for Drug Evaluation and Research (CDER), FOOD AND DRUG ADMINISTRATION (FDA).

Md Abdullah Mamun, Completed July 2019
Title of Dissertation: A treatise on independent component analysis in the presence of noise - simulation and data applications in neuroimaging

Dr. Abdullah is currently a research scientist at Baylor, Scott and White medical center

Srichand Jasti, Completed July 2019

Title of Dissertation: Improving the efficiency of A and D optimal designs for dose response models

Mr. Jasti is a currently a senior biostatistician at Alcon eye care.

<u>Shanshan Wang</u> (current) - Ms. Wang is a current Ph.D. student working under my supervision on the implementation of machine learning techniques for predictive modeling on Alzheimer's and other neuro-degenerative diseases.

SERVICE TO THE PROFESSION

Referee for the following Journals

1. Journal of American Statistical Association (JASA)
2. Statistica Sinica
3. Journal of Neurolinguistics
4. Neuroimage
5. Human Brain Mapping
6. Magnetic Resonance in Medicine
7. Journal of Neuroscience Methods
8. Plos One
9. Journal of Statistical Software
10. Journal of Medical Internet Research
11. Nursing Research
12. BMJ Open
13. Health Services and Outcomes Research Methodology
14. Computational Statistics and Data Analysis
15. Stat

PUBLICATIONS (300+ citations)

Ph.D. Thesis

R. **Nandy.** Estimation of Spectral Gap using Coupling techniques (2001).

Peer Reviewed Articles

1. **R. Nandy**, D. Cordes. Novel ROC-type method for testing the efficiency of multivariate statistical methods in fMRI, *Magnetic Resonance in Medicine*, 49:1152-1162 (2003).

2. **R. Nandy**, D. Cordes. Novel nonparametric approach to canonical correlation analysis with applications to low CNR functional MRI data, *Magnetic Resonance in Medicine*, 50: 354-365 (2003).

3. L. Stanberry, **R. Nandy**, D. Cordes. Cluster analysis of fMRI data using dendrogram sharpening. *Human Brain Mapping,* 20:201-219 (2003).

4. **R Nandy**, D. Cordes. Improving the spatial specificity of canonical correlation analysis in fMRI. *Magnetic Resonance in Medicine,* 52:947-952 (2004).

5. **R Nandy**, D. Cordes. New approaches to ROC methods in fMRI with real data using repeated trials. *Magnetic Resonance in Medicine,* 52:1424-1431 (2004).

6. L. Stanberry, T. Richards, V. W. Berninger, **R. Nandy**, E. Aylward, K. Maravilla, D. Cordes. Low Frequency Signal Changes Reflect Differences in Functional Connectivity between Good Readers and Dyslexics during Continuous Phoneme Mapping. *Magnetic Resonance Imaging,* 24:217-29 (2006).

7. D. Cordes, **R. Nandy**. Estimation of the intrinsic dimensionality of fMRI data. *Neuroimage,* 29:145-154 (2006).

8. **R. Nandy**, D. Cordes. A semi-parametric approach to estimate the family-wise error rate in fMRI using resting-state data. *Neuroimage*, 34:1562-1576 (2007).

9. D. Cordes, **R Nandy**. Independent Component Analysis in the Presence of Noise in fMRI. *Magnetic Resonance Imaging*, 25:1237-48 (2007).

10. J. Sanz, K. Karlsgodt, C. Bearden, T. Van Erp, **R. Nandy**, K. Nuechterlein, T. Cannon. Regional Brain Physiology During Working Memory Processing and Clinical Presentation in Recent Onset Patients with Schizophrenia. *Psychiatry Research: Neuroimaging,* 173(3):177-82 (2009).

11. D. Cordes, M. Jin, T. Curran & **R. Nandy**. Optimizing the Performance of Local Canonical Correlation Analysis in fMRI using Spatial Constraints. *Human Brain Mapping*, 33:2611-26 (2012).

12. M. Jin, **R. Nandy**, T. Curran & D. Cordes. Extending Local Canonical Correlation Analysis to Handle Different Linear Contrasts for fMRI Data. *International Journal of Biomedical Imaging*, Article ID 574971 (2012).

13. M. Jin, V. Pelak, T. Curran, **R. Nandy**, & D. Cordes. A preliminary study of functional abnormalities in aMCI subjects during different episodic memory tasks. *Magnetic Resonance Imaging*, 30(4):459-70 (2012).

14. D. Cordes, M. Jin, T. Curran, & **R. Nandy.** The Smoothing Artifact of Spatially Constrained Canonical Correlation Analysis in Functional MRI. *International Journal of Biomedical Imaging*, Article ID 738283 (2012).

15. D. Cordes, G. Herzmann, **R. Nandy** & T. Curran. Optimization of Contrast Detection Power with Probabilistic Behavioral Information. *Neuroimage* (2012).

16. Jin, M., **R. Nandy**, & Cordes, D. Fast Constrained Canonical Correlation Analysis for fMRI. *Visualization, Image Processing and Computation in Biomedicine*, 10.1615 (2012).

17. B. Mcevoy*, **R. Nandy**, R. Tewari, Bayesian Model Selection Approach for Clinical Trial Safety Data Using An Ising Prior. *Biometrics*, 69:661-72 (2013)

18. D. Cordes, **R. Nandy**, S. Schafer, T. Wager. Characterization and Reduction of Cardiac- and Respiratory- Induced Noise as a Function of the Sampling Rate (TR) in fMRI. *Neuroimage*, 89:314-30 (2014).

19. S. Spohr, **R. Nandy**, D. Gandhiraj, S. Anne, A. Vemulapalli, S. Walters. Efficacy of SMS Text Message Interventions for Smoking Cessation: A Meta-Analysis. *Journal of Substance Abuse Treatment*, 2015 Sep;56:1-10.

20. K. Nandy, **R. Nandy**. A study of the performance of 2-stage adaptive optimal designs in a logistic dose-response model. *Communications in Statistics - Simulation and Computation,* 2015

21. **Nandy, R**. Extending The GLM for Analyzing fMRI Data to A Constrained Multivariate Regression Model. *Proceedings 60th ISI World Statistics Congress,* 2015.

22. K. Nandy, **R. Nandy**. Optimal Designs for a Logistic Dose-Response Model with Restricted Dose Levels. *Proceedings 60th ISI World Statistics Congress*, 2015.

23. K. Gopal, B. Thomas, **R. Nandy**, D. Mao, H. Lu**.** Potential Audiological and MRI Markers of Tinnitus. *Journal of the American Academy of Audiology* (2017).

24. X. Zhuang, Z. Yang, T. Curran, **R. Nandy**, D. Cordes. A family of locally

constrained CCA models for detecting activation patterns in fMRI. *Neuroimage,* 149:63-84 (2017).

25. Z. Yang, X. Zhuang, K. Sreenivasan, V. Mishra, T. Curran, R. Byrd, **R. Nandy**, D. Cordes. 3D spatially-adaptive canonical correlation analysis: Local and global methods. *Neuroimage,* 169:240-255 (2018).

26. Baumgartner LS, Moore E, Shook D, Messina S, Day MC, Green J, **Nandy R**, Seidman M, Baumgartner JE. Safety of Autologous Umbilical Cord Blood Therapy for Acquired Sensorineural Hearing Loss in Children.. *Journal of audiology & otology.* 2018 August 22

27. Gopal K, Mills V, Philips B, **Nandy R**. Risk Assessment of Recreational Noise-Induced Hearing Loss from Exposure Through a Personal Audio System – iPod Touch. *Journal of the American Academy of Audiology.* 2018 April; 30. (7)

28. **Nandy RR,** Nandy K, Hébert ET, Businelle MS, Walters ST. Identifying Behaviors Predicting Early Morning Emotions by Observing Permanent Supportive Housing Residents: An Ecological Momentary Assessment. JMIR Ment Health. 2019 Feb 7;6(2):e10186. doi: 10.2196/10186. PMID: 30730296; PMCID: PMC6385519.

29. Zhuang X, Yang Z, Sreenivasan KR, Mishra VR, Curran T, **Nandy R**, Cordes D. Multivariate group-level analysis for task fMRI data with canonical correlation analysis. Neuroimage. 2019 Jul 1;194:25-41. doi: 10.1016/j.neuroimage.2019.03.030. Epub 2019 Mar 17. PMID: 30894332; PMCID: PMC6536339.

30. Gopal KV, Schafer EC, Mathews L, **Nandy R**, Beaudoin D, Schadt L, Brown A, Phillips B, Caldwell J. Effects of Auditory Training on Electrophysiological Measures in Individuals with Autism Spectrum Disorder. J Am Acad Audiol. 2020 Feb;31(2):96-104. doi: 10.3766/jaaa.18063. Epub 2019 Jul 1. PMID: 31267957.

31. Zhuang X, Mishra V, **Nandy R**, Yang Z, Sreenivasan K, Bennett L, Bernick C, Cordes D. Resting-State Static and Dynamic Functional Abnormalities in Active Professional Fighters With Repetitive Head Trauma and With Neuropsychological Impairments. Front Neurol. 2020 Dec 10;11:602586. doi: 10.3389/fneur.2020.602586. PMID: 33362704; PMCID: PMC7758536.

32. **R Nandy**, S Jasti* and K Nandy. Finite Sample Properties of A-Optimal Designs for Binary Response Data. Statistics and Applications {ISSN 2452-7395 (online)}Volume 18, No. 2, 2020(New Series), pp 383-391

33. Ananth S, Shrestha N, Treviño C JA, Nguyen US, Haque U, Angulo-

Molina A, Lopez-Lemus UA, Lubinda J, Sharif RM, Zaki RA, Sánchez Casas RM, Cervantes D, **Nandy R**[1]. Clinical Symptoms of Arboviruses in Mexico. Pathogens. 2020 Nov 19;9(11):964. doi: 10.3390/pathogens9110964. PMID: 33228120; PMCID: PMC7699393.

34. Gibbs LD, Mansheim K, Maji S, **Nandy R**, Lewis CM, Vishwanatha JK, Chaudhary P. Clinical Significance of Annexin A2 Expression in Breast Cancer Patients. Cancers (Basel). 2020 Dec 22;13(1):2. doi: 10.3390/cancers13010002. PMID: 33374917; PMCID: PMC7792619.

35. Rajendiran S, Maji S, Haddad A, Lotan Y, **Nandy RR**, Vishwanatha JK, Chaudhary P. MicroRNA-940 as a Potential Serum Biomarker for Prostate Cancer. Front Oncol. 2021 Mar 19;11:628094. doi: 10.3389/fonc.2021.628094. PMID: 33816263; PMCID: PMC8017318.

36. Cordes D, Kaleem MF, Yang Z, Zhuang X, Curran T, Sreenivasan KR, Mishra VR, **Nandy R**, Walsh RR. Energy-Period Profiles of Brain Networks in Group fMRI Resting-State Data: A Comparison of Empirical Mode Decomposition With the Short-Time Fourier Transform and the Discrete Wavelet Transform. Front Neurosci. 2021 May 21;15:663403. doi: 10.3389/fnins.2021.663403. PMID: 34093115; PMCID: PMC8175789

37. O'Bryant, SE, Johnson, LA, Barber, RC, **Nandy RR** et al. The Health & Aging Brain among Latino Elders (HABLE) study methods and participant characteristics. Alzheimer's Dement. 2021; 13:e12202. https://doi.org/10.1002/dad2.12202

38. Gopal KV, Schafer EC, Mathews L, **Nandy R**, Beaudoin D, Schadt L, Brown A, Phillips B, Caldwell J. Characteristic Deviations of Auditory Evoked Potentials in Individuals with Autism Spectrum Disorder. 2021 Jun;32(6):379-385. doi: 10.1055/s-0041-1730365 J Am Acad Audiol.

39. **Nandy R.** A Novel Approach to Estimate the Intrinsic Dimension of fMRI Data Using Independent Component Analysis. Strategic Management, Decision Theory, and Decision Science, 2021 (ISBN: 978-981-16-1368-5, Springer Nature).

40. Koonisetty, K. S., Aghamohammadi, N., Urmi, T., Yavaşoglu, S. İ., Rahman, M. S., **Nandy, R.**, & Haque, U. (2021). Assessment of knowledge, attitudes, and practices regarding dengue among physicians: A web-based cross-sectional survey. Behavioral Sciences, 11(8). doi:10.3390/bs11080105

41. **Nandy R.R.** (2022). The Efficacy of Mask Mandates in the United States during the Early Days of the Pandemic. Managing Complexity and COVID-19 - Life, Liberty, or the Pursuit of Happiness - Edited By Aurobindo Ghosh, Amit Haldar, Kalyan Bhaumik. ISBN 9781032115160, DOI: 10.4324/9781003218807-10

42. Xiaowei Zhuang, Lauren Bennett, **Rajesh Nandy**, Dietmar Cordes, Charles Bernick, and Aaron Ritter (2022). Longitudinal changes in cognitive functioning and brain structure in professional boxers and mixed martial artists after they stop fighting Neurology

Manuscripts submitted or in preparation

43. B. Mcevoy*, **R. Nandy**, R. Tewari. Simultaneous modeling of continuous and categorical endpoints using Bayesian variable selection with application to clinical drug safety data. *Journal of American Statistical Association*

44. **Nandy, R.** A novel approach to estimate the intrinsic dimension of fMRI data using independent component analysis. *Magnetic Resonance Imaging.*

45. **Nandy, R.** Estimating the Number of Signals in mixed data with stationary colored noise in the absence of reference noise samples. *IEEE trans. on signal processing*

46. **R. Nandy**, B. Mcevoy*. A Bayesian approach to fMRI data analysis using Stochastic Search Variable Selection

47. **R Nandy**. A threshold free method of detecting brain activation in fMRI data by minimizing the estimated misclassification probability

48. **R. Nandy.** Nonparametric mixture modeling and power analysis.

49. K. Nandy, **R. Nandy.** Hierarchical Bayes State-level Estimates of Smoking Prevalence Among Nurses: An Analysis of the Tobacco-Use Supplement to the Current Population Survey 2010-2011.

*Doctoral student
[1]Senior author

Abstracts from Proceedings (peer reviewed citable publications):

1. **R. Nandy**, C. Green, D. Cordes. Hippocampal Activation during Memory Related Tasks and Canonical Correlation Analysis. ISMRM (2002).

2. **R. Nandy**, C. Green, D. Cordes. Canonical Correlation Analysis and Modified ROC Methods for fMRI Techniques. ISMRM (2002).

3. **R. Nandy**, C. Green, D. Cordes. Non-parametric Analysis of fMRI data using Bootstrap in Autoregression. ISMRM (2002).

4. **R. Nandy**, L. Stanberry, D. Cordes. A novel nonparametric estimation of p-values in fMRI using resting state data. ISMRM (2003).

5. **R. Nandy**, Y. Gel, D. Cordes. A geostatistical approach to the modeling of the spatial structure of the brain. ISMRM (2003).

6. **R. Nandy**, D. Cordes. Solving the multiple comparison problem in fMRI with a novel nonparametric approach using bootstrap in autoregression. ISMRM (2003).

7. **R. Nandy**, D. Cordes. Canonical correlation analysis and a novel assignment scheme for fMRI activation. ISMRM (2003).

8. **R. Nandy**, D. Cordes. A novel ROC type method based on real (non-simulated) fMRI data. ISMRM (2003).

9. **R. Nandy**, D. Cordes. Solving the multiple comparison problem in fMRI using a method based on bootstrapping the Order Statistics of the resting state data. ISMRM (2004).

10. **R. Nandy**, D. Cordes. Modeling of the spatial covariance structure of the brain using variograms with a non-Euclidean metric. ISMRM (2004).

11. **R. Nandy**, D. Cordes. Analysis of the spatial specificity of canonical correlation analysis in fMRI. ISMRM (2004).

12. L. Stanberry, D. Cordes, T. Richards, **R. Nandy**, V. Berninger. Comparing functional connectivity in normal and dyslexic readers with cluster analysis using a continuous phonological task. ISMRM (2004).

13. D.Cordes, **R. Nandy**. Investigating the Reliability of ICA Sources Obtained After PCA Preprocessing. ISMRM (2004).

14. Y. Gel, D. Cordes, T. Richards, **R. Nandy**, V. Berninger. Spatial Analysis of Structural MR Data using a Geostatistical Method: Empirical Variogram Approach. ISMRM (2004).

15. **R. Nandy**, D. Cordes. Robust bilateral hippocampal activation with a visual encoding paradigm using Canonical Correlation Analysis. ISMRM (2005).

16. **R. Nandy**, D. Cordes. Comparing sensitivities of head coils in fMRI using ROC methods with real data. ISMRM (2005).

17. **R. Nandy**, D. Cordes. A semi-parametric approach to estimate p-values for activation in fMRI correcting for multiple testing and low frequency processes. ISMRM (2005).

18. **R. Nandy**, D. Cordes. An empirical diagnostic tool to estimate the true

dimension of fMRI data. ISMRM (2005).

19. **R. Nandy**. Nonparametric mixture modeling for mapping of brain activation using functional MRI data ISMRM (2006).

20. **R. Nandy**. A Semi-parametric Approach To Estimate the Family-Wise Error Rate in fMRI Using Resting-State Data, Joint Statistical Meeting, Seattle (2006)

21. **R. Nandy**. Investigation of a dual thresholding scheme in fMRI using ROC methods with real data. ISMRM (2007).

22. **R. Nandy**. Stochastic Search Variable Selection method with anatomical prior to detect brain activation from functional MRI data, 7th World Congress in Probability and Statistics, National University, Singapore (2008)

23. D.Cordes, M. Jin, **R. Nandy.** Discriminant analysis and prediction of aMCI subjects and normal controls using encoding and recognition fMRI tasks. ISMRM (2011).

24. D.Cordes, M. Jin, **R. Nandy**. The Bleeding Artifact of Spatially Constrained Canonical Correlation Analysis in Functional MRI. ISMRM (2011).

25. M. Jin, D.Cordes, **R. Nandy**. Investigation of Efficient Implementation of Local Constrained Canonical Correlation Analysis for fMRI. ISMRM (2011).

26. M. Jin, V. Pelak, T. Curran, **R. Nandy**, and D. Cordes. Altered medial temporal lobe activations in aMCI subjects during encoding and recognition tasks. ISMRM (2011).

27. **R. Nandy**, D. Cordes. A multivariate regression framework for the analysis of fMRI data accounting for spatial correlation. ISMRM (2011).

28. D. Cordes, M. Jin, T. Curran, and **R. Nandy**. Artifacts and Spatial Dominance Constraints using Canonical Correlation Analysis in Functional MRI, Human Brain Mapping Conference, (2011).

29. D. Cordes, T. Curran, M. Jin, and **R. Nandy**. Optimization of Contrast Power using Probabilistic Behavioral Information, Human Brain Mapping Conference, (2011).

30. D. Cordes, M. Jin, T. Curran, V. Pelak, and **R. Nandy**. Differentiation of aMCI Subjects and Normal Controls using Multivariate Analysis of fMRI Data, Human Brain Mapping Conference, (2011).

31. M. Jin, V. Pelak, T. Curran, **R. Nandy**, D. Cordes. Abnormal resting-state activity in default mode network of aMCI subjects, Human Brain Mapping Conference, (2011).

32. M. Jin, V. Pelak, T. Curran, **R. Nandy**, D. Cordes. Memory activation changes of aMCI subjects in subregions of the medial temporal lobe, Human Brain Mapping Conference, (2011).

33. D. Cordes, G. Herzmann, **R. Nandy**, T. Curran. Memory Activation for Recollection and Familiarity in the Medial Temporal Lobes using fMRI. Human Brain Mapping Conference, Beijing, (2012).

34. D. Cordes, **R. Nandy**, S. Schafer, T. Wager. Characterization and Reduction of Cardiac- and Respiratory- Induced Noise as a Function of the Sampling Rate (TR) in fMRI, Proceedings ISMRM, Milan, (2014).

35. M. Merener, R. Byrd, **R. Nandy**, D. Cordes. A New Model for Canonical Correlation Analysis with Spatial Constraints, Proceedings ISMRM, Milan, (2014).

36. M. Merener, T. Curran, R. Byrd, **R. Nandy**, D. Cordes. A study of new constraints in Canonical Correlation Analysis for detection of activation patterns, HBM conference, Hamburg, (2014).

37. M. Merener, T. Curran, R. Byrd, **R. Nandy**, D. Cordes. A new cross-validation technique for active-voxel detection methods based on groups of voxels, HBM conference, Hamburg, (2014).

38. **R. Nandy**. Estimating the intrinsic dimension of fMRI data using ICA, HBM conference, Honolulu (2015).

39. **R. Nandy**. A novel non-parametric threshold-free method to produce fMRI activation maps, HBM conference, Vancouver (2017).

40. Z. Yang, X. Zhuang, K. Sreenivasan, V. Mishra, T. Curran, R. Byrd, **R. Nandy**, D. Cordes. 3D Spatially-Adaptive Canonical Correlation Analysis for Episodic Memory Task fMRI Data: Local and Global Methods, Proceedings ISMRM, Paris, (2018).

41. Xiaowei Zhuang, Zhengshi Yang, **Rajesh Nandy**, Tim Curran, Dietmar Cordes Multivariate Second Level Analysis in fMRI with Canonical Correlation Analysis, Proceedings ISMRM, Paris, (2018).

42. **R. Nandy**. A novel entropy based approach to estimate the number of components for ICA in noisy fMRI data, HBM conference, Singapore (2018).

43. Empirical Mode Decomposition and Energy-Period Characteristics of Brain Networks in Group fMRI Resting-State Data, Proceedings ISMRM, Montreal, (2019).

1. Invited Speaker "Spectral gap for Markov chains and coupling" Indian Statistical Institute, Calcutta (1997)

2. Invited Speaker "Quantum probability: A functional approach" University of Washington, Seattle (1998)

3. Invited Speaker "Quantum integrals" University of Washington, Seattle (2000)

4. Invited Speaker "Quantum stochastic calculus" University of Washington, Seattle (2001)

5. Invited Speaker "A non-parametric approach to multiple comparison problem using resting state data" ISMRM, Toronto (2003)

6. Invited Speaker "Canonical correlation analysis and a novel assignment scheme for fMRI activation" ISMRM, Toronto (2003)

7. Invited Speaker "Investigating the frequency dependence of the spatial gradient artifacts for the analysis of resting state data" ISMRM, Toronto (2003)

8. Invited Speaker "ROC methods in fMRI with real data using repeated trials: Limitations and Improvements" ISMRM, Kyoto (2004)

9. Invited Speaker "Choosing the optimal set of basis functions for fMRI data analysis using ROC methods with real data" ISMRM, Miami (2005)

10. Invited Speaker "ROC methods with real fMRI data" Departments of Biostatistics and Epidemiology, University of Illinois, Chicago (2006)

11. Invited Speaker "Canonical Correlation Analysis in functional MRI" International Conference on Multivariate Statistical Methods in the 21st Century, Kolkata (2006)

12. Invited Speaker "A Semi-parametric Approach to Estimate the Family-wise Error Rate in fMRI Using Resting-state Data" Departments of Statistics, University of Maryland, Baltimore County (2007)

13. Invited Speaker "A Bayesian approach to fMRI data analysis using Stochastic Search Variable Selection" 2nd Probability and Statistics Day at University of Maryland, Baltimore County (2008)

14. Invited Speaker "Stochastic Search Variable Selection method with anatomical prior to detect brain activation from functional MRI data" 7th World Congress in Probability and Statistics, National University, Singapore (2008)

15. Invited Speaker "A Novel Test Statistic for Local Canonical Correlation Analysis of fMRI Data" Human Brain Mapping conference, San Francisco (2009)

16. Invited Speaker "ROC methods in functional MRI using real data" Graduate Student workshop at Clarkson University, Potsdam, New York (2009).

17. Invited Speaker "Restricted Canonical Correlation Analysis and Multivariate Regression for analyzing Neuroimaging data with custom contrasts" International conference in Mathematics and applications (ICMA - MU 2009), Bangkok. Also presented at 7th International Triennial Calcutta Symposium on Probability and Statistics, India

18. Invited Speaker "General talk on fMRI data analysis" Department of Statistics, University of Tampere, Finland (2010).

19. Invited Speaker "Regression for Analyzing Functional MRI Data with Custom Contrasts" Part of Invited session "Advances in the Spatio-Temporal Analysis of Functional Magnetic Resonance Imaging (fMRI) Data", ENAR 2011 Spring Meeting, Miami

21. Invited Speaker "Estimating the intrinsic dimensionality of multivariate data in the presence of strong correlated noise" 2014 IISA Conference. Riverside, CA

22. Invited Speaker "Independent Component Analysis in the presence of unknown correlated Gaussian noise" UC Riverside Statistics Colloquium, May 2015.

23. Invited Speaker "Analysis of Spatial and Spatio-Temporal Data", 4th Institute of Mathematical Statistic Asia Pacific Rim Meeting, June 2016, Hong Kong

24. Invited Speaker "Noisy ICA", Applied Statistics Unit, Indian Statistical Institute, Dec 2017, Kolkata, India

25. Invited Speaker "Contributions to Optimality Issues in Real Life Statistical Design", Annual Conference of the International Indian Statistical Association, Dec 2017, Hyderabad, India

26. Invited Speaker "An Ecological Momentary Assessment of Mood Among Permanent Supportive Housing Residents in Texas: Observations from the Mobile Community Health Assistance for Tenants (m.chat) Program", 2018 USPHS Scientific and Training Symposium, June 2018, Dallas

27. Offered a workshop on innovative analysis of functional MRI data at University of Maryland Baltimore County, Department of Mathematics and

Statistics, Nov 2018

28. Keynote speaker at 6th African International Conference on Statistics (Ethiopia, May 2019)

29. Keynote speaker at International Conference on Environmental and Medical Statistics, Postgraduate Institute of Science, University of Peradeniya, Sri Lanka, Jan 2020

30. Presenter at NIMH Workshop on Advanced Statistical Methods and Dynamic Data Visualizations for Mental Health Studies, Jun 2021

RESEARCH SUPPORT (current)

R01 AG058537, O'Bryant (PI)   04/01/2018 – 05/31/2021
1.20 CY mo.
NIH/NIA $365,342
An Alzheimer's Blood Test for Primary Care (ADPC Study
The major goals of this study are to determine if our AD Blood test can (1) detect AD in primary care settings and (2) detect prodromal AD in primary care settings.
Role: Co-Investigator

1R21 EY032320, Dimitrios (PI)   09/01/2020 – 005/31/2022
0.60 CY mo.
NIH/NIE $275,000
Exploring the Role of Gonadotropins in Down Syndrome
The proposed study aims to determine and validate the role of gonadotropins in the DS population with the keratoconus co-morbidity with the long-term goal to better understand the underlying mechanisms that result in increased risk for ocular co-morbidities such as keratoconus among this population.
Role: Co-Investigator

R01 AG058533, O'Bryant (PI)   08/01/2020 – 04/30/2025
2.4 CY mo.
NIH/NIA $45,656,674
Health and Aging Brain Among Lation Elders (Hable-AT(N)) Study.
This study will examine both PET-based and blood-based biomarkers of amyloid (A), tau (T) and neurodegeneration (N) at baseline and follow-up examinations. The information gained will (1) provide data to determine if the 2018 AT(N) Framework requires ethnic adjustments, (2) create a multi-tiered system that can be deployed in primary care settings to screen Mexican Americans with blood-based tools into novel trials and (3) provide methods and data to support ethnically-appropriate tailored novel clinical

trials aimed at treating and preventing AD among this underserved population.
Role: Co-Investigator

U19 AG068054, O'Bryant (PI)   09/01/2020 – 08/31/2025
3.0 CY mo.
NIH/NIA $20,980,417
Alzheimer's Biomarker Consortium – Down Syndrome (ABC–DS)
The major goal of this study is to test hypotheses related to how Alzheimer's Disease in Down syndrome may parallel sporadic Alzheimer's Disease within an amyloid, tau, neurodegeneration AT(N) framework and to identify modifiers of risk of conversion/progression.
Role: Co-Investigator

CxPM (RP00040), O'Bryant (PI)   05/01/2020 – 05/31/2022
0.24 CY mo.
CxPM $509,204
Blood-Based Screen for Detecting Neurological Diseases in Primary Settings
The goal of this study is to provide simple proteomics based test kits in primary care settings to rule out AD.
Role: Co-Investigator

R01 AG071566   04/01/2021 – 03/31/2026
1.2 CY mo.
NIA (MPI: Cordes, Lowe) $500,000
Machine and deep learning for finding multimodal imaging biomarkers in prodromal AD
The proposed study focuses on developing deep neural networks and sophisticated multivariate analysis methods for studying episodic memory activations in prodromal AD subjects and age-matched normal controls.
Role: Sub-contract PI

RESEARCH SUPPORT (pending)

R01 AG070862-01A1 (JIT processed)   09/01/2021 – 08/31/2026
1.2 CY mo.
NIA (PI: Barber) $3,500,000
Epigenetic Risk Factors for AD Age at Onset and Health Disparities: HABLE Epigenetics Study
The goal of this study is to identify DNA methylation patterns associated with Alzheimer's disease (AD) presence and progression among Mexican American participants in the Health & Aging Brain Study of Latino Elders (HABLE) cohort, and their association with amyloid, tau and neurodegeneration [AT(N)] biomarkers.

RESEARCH SUPPORT (past)

U01AG051214S2 NIH/NIA Shupf (PI)   09/01/2018 – 08/31/2020
Biomarkers of Alzheimer's Disease in Adults with Down Syndrome
The goal of this study is to generate unbiased proteomics in the ABC-DS consortium in order to (1) identify blood-based biomarkers associated with incident MCI/AD among adults with Down syndrome and (2) identify blood-based biomarkers associated with amyloid and tau PET positivity among adults with Down syndrome.
Role: Co-I

17958 O'Bryant (PI)   09/01/2019 – 05/31/2020
Michael J. Fox Fnd for Parkinson's Res
Blood Biomarkers for Discriminating Amongst Neurodegenerative Diseases
The goal of this project is to identify blood biomarkers for successful prediction of onset of Neurodegenerative Diseases
Role: Co-I

UMBC Nandy, R (PI)   10/01/2017 – 03/31/2019
The Center for Interdisciplinary Research and Consulting - Department of Math/Stat, UMBC
A Novel Nonparametric Threshold Free Method to Produce fMRI Activation Maps using Minimum Misclassification Rate.
This award supports a novel approach to detect fMRI activation using misclassification rate.
Role: PI

R56AG058533 NIH O'Bryant (PI)   09/20/2018 – 08/30/2019
Amyloid Burden among Mexican Americans
The goals of this study are (1) demonstrate feasibility of recruitment of Mexican Americans into PET amyloid and tau studies and (2) generate pilot data regarding blood and cerebral amyloid and tau levels among Mexican Americans in the HABLE cohort.
Role: Co-I

Florida Children's Hospital   Nandy, R (PI) 04/04/2017-10/03/2017
Safety of Autologous Stem Cell Treatment for Acquired Hearing Loss in Children
Role: PI

DSRIP 138980111.2.6, Walters, S (PI)   06/01/2013-12/31/2017
Centers for Medicare & Medicaid Services (Federal Non-NIH)
Health Navigation Incentives for Dual Diagnosis Patients
Objective: This project was aimed at developing and testing a technology-assisted

health-coaching program for adults residing in Tarrant County permanent supportive housing programs.
Role: Co-Investigator

NIH, R01   Cordes, D (PI)   06/01/13-05/31/16
Improving the Detection of Activation in High Resolution fMRI using Multivariate Methods
Role: sub-contract local PI / consultant

NIH, 1R21AG026635-01A2   Cordes, D (PI)   9/01/07-6/30/09
Functional MRI and Alzheimer's Disease
Role: sub-contract local PI (18% support)

NIH, RO1 AG01338:11   6/01/07-5/30/12
Combined fMRI, structural MRI, 18MPPF PET and APOE status to detect AD Risk
This program proposes to use high resolution functional MRI of the hippocampus in combination with critical unfolding techniques, and 18F MPPF PET, a 5HT1a receptor ligand, to identify early changes in hippocampal structure and function in subjects with a genetic risk for Alzheimer's Disease, possessing a APOE-4 allele.
Role: Co-Investigator

NIMH, 1 P50 MH077248-01   9/01/06-/30/11
CIDAR: Translational Research to Enhance Cognitive Control (TRECC)
This CIDAR conducts translational research to examine brain circuit and pharmacology involved in attention deficit/hyperactivity disorder (ADHD) and chronic tic disorder (CTD).
Role: Co-Investigator

NIH, PO1 AG025831-01   2/1/06-2/1/11
Amyloid plaque and tangle imaging in aging and dementia
This program project uses FDDNP to measure amyloid burden in patients with MCI and AD. Project 3 uses structural and functional MRI to
measure the relationship between amyloid birden, functional abnormalities and hippocampal atrophy.
Role: Co-Investigator

NIH, P20 DA022539   9/30/06 – 4/30/07
Methamphetamine Abuse, Inhibitory Control: Implications for Treatment
This program proposes to use high resolution functional MRI of the hippocampus in combination with critical unfolding techniques, and 18F MPPF PET, a 5HT1a receptor ligand, to identify early changes in hippocampal structure and function in subjects with a genetic risk for Alzheimer's Disease, possessing a APOE-4 allele.
Role: Co-Investigator

NIH/NICHD P50 33812   **03/01/96 - 11/30/05**
Learning Disabilities: Links to Schools and Biology
The major goal of this project is to use MR spectroscopy and functional MRI to study brain activation in children with learning disabilities.
Role: Co-Investigator

INTRAMURAL SUPPORT

Co-investigator: UNTHSC Faculty Pilot Grant for FY15 - "Effects of acute muscle fatigue on postural control in persons with Parkinson's disease". PI (Evan Papa, Physical Therapy).

Co-investigator: UNTHSC Faculty Pilot Grant for FY15 - "A CBPR model for providing neighborhood level and personalized air quality data in Fort Worth". PI (David Sterling, Environment and Occupational Health Sciences).