Debangan Dey, Ph.D.

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Overview

Summary — A biostatistician focused on developing methods to analyze intensive multilevel multimodal longitudinal data and big geospatial data. Applications focus on Digital Health Technologies (DHTs) and Environmental Sciences.

Areas of interest — Functional data analysis, longitudinal data, spatial statistics, stochastic processes, semiparametric statistics.

Work Experience

2022 – · · · · **Postdoctoral fellow.** National Institute of Mental Health. Lead analyst for Motor Activity Research Consortium for Health (mMarch).

2021 **Applied Scientist Intern.** Amazon.

2020 **Analyst.** Baltimore City Health Department - Johns Hopkins Data Analysis Support Team for COVID-19 Response.

2015, 2016 **Summer Intern.** Johns Hopkins Bloomberg School of Public Health Dept. of Biostatistics.

Education

2017 – 2022 **Ph.D., Johns Hopkins Bloomberg School of Public Health** in Biostatistics.
Thesis title: *Topics in Modeling of Multivariate Mixed Data Types and Highly Multivariate Spatial Data*

2015 – 2017 **Masters, Indian Statistical Institute** in Statistics.
Thesis title: *On Investigation of Genotypic Association with Longitudinal Observations of Traits*.

2012 – 2015 **Bachelors, Indian Statistical Institute** in Statistics.

Research Publications and Repositories

Journal Articles

1. **D. Dey**, S. Banerjee, M. A. Lindquist, and A. Datta, "Graph-constrained analysis for multivariate functional data," *Journal of Multivariate Analysis*, p. 105 428, 2025.

2. **D. Dey**, R. Ghosal, K. Merikangas, and V. Zipunnikov, "Functional principal component analysis for continuous non-gaussian, truncated, and discrete functional data," *Statistics in Medicine*, 2024.

3. T. M. Lateef, **D. Dey**, A. Leroux, L. Cui, M. Xiao, V. Zipunnikov, and K. R. Merikangas, "Association between electronic diary–rated sleep, mood, energy, and stress with incident headache in a community-based sample," *Neurology*, vol. 102, no. 4, e208102, 2024, **Article featured at CNN, Nat Geo, NIH Director's blog and others**.

4. **D. Dey**, A. Datta, and S. Banerjee, "Modeling multivariate spatial dependencies using graphical models," *The New England Journal of Statistics in Data Science*, pp. 1–13, 2023.

5. J. Glaus, S. J. Kang, W. Guo, F. Lamers, M.-P. F. Strippoli, A. Leroux, **D. Dey**, K. J. Plessen, J. Vaucher, P. Vollenweider, *et al.*, "Objectively assessed sleep and physical activity in depression subtypes and its mediating role in their association with cardiovascular risk factors," *Journal of psychiatric research*, vol. 163, pp. 325–336, 2023.

6. E. K. Stapp, V. Zipunnikov, A. Leroux, L. Cui, M. M. Husky, **D. Dey**, and K. R. Merikangas, "Specificity of affective dynamics of bipolar and major depressive disorder," *Brain and Behavior*, e3134, 2023.
7. **D. Dey**, A. Datta, and S. Banerjee, "Graphical gaussian process models for highly multivariate spatial data," *Biometrika*, vol. 109, no. 4, pp. 993–1014, 2022.
8. M. R. Kaufman, **D. Dey**, C. Crainiceanu, and M. Dredze, "# metoo and google inquiries into sexual violence: A hashtag campaign can sustain information seeking," *Journal of interpersonal violence*, vol. 36, no. 19-20, pp. 9857–9867, 2021.
9. **D. Dey** and V. Zipunnikov, "Discussion of "an epidemiological forecast model and software assessing interventions on the covid-19 epidemic in China"," *Journal of Data Science*, vol. 18, no. 3, pp. 433–436, 2020.
10. S. Deb and **D. Dey**, "Spatial modeling of shot conversion in soccer to single out goalscoring ability," *Journal of Sports Analytics*, vol. 5, no. 4, pp. 281–297, 2019.
11. V. R. Varma, **D. Dey**, A. Leroux, J. Di, J. Urbanek, L. Xiao, and V. Zipunnikov, "Total volume of physical activity: TAC, TLAC or TAC (λ)," *Preventive medicine*, vol. 106, pp. 233–235, 2018.
12. A. Spira, V. Zipunnikov, M. Wu, **D. Dey**, E. Simonsick, L. Ferrucci, C. Davatzikos, and S. Resnick, "Association of circadian rest and activity rhythms with brain volumes in cognitively normal older adults," *Innovation in Aging*, vol. 1, no. suppl_1, pp. 866–866, 2017.
13. V. R. Varma, **D. Dey**, A. Leroux, J. Di, J. Urbanek, L. Xiao, and V. Zipunnikov, "Re-evaluating the effect of age on physical activity over the lifespan.," *Preventive medicine*, vol. 101, pp. 102–108, 2017, **Article featured at TIME, Washington Post, WSJ, BBC, WPYR and others**.
14. V. Zipunnikov, **D. Dey**, A. Leroux, J. Di, J. Urbanek, J. Schrack, and C. Crainiceanu, "Total physical activity and its circadian allocation are independent predictors of mortality," *Innovation in Aging*, vol. 1, no. Suppl 1, p. 1239, 2017.

Preprints and Under Revision

1. **D. Dey** and V. Zipunnikov, *Semiparametric gaussian copula regression modeling for mixed data types (SGCRM)*, 2022. arXiv: 2205.06868 [stat.ME].
2. **D. Dey** and V. Zipunnikov, *Connecting population-level auc and latent scale-invariant R^2 via semiparametric gaussian copula and rank correlations*, 2019. arXiv: 1910.14233 [stat.ME].

Packages and Repositories

1. **D. Dey** and R. Ghosal, *R package – SGCTools: Analysis tools for multivariate mixed data and continuous/truncated/discrete functional data using Semiparametric Gaussian Copula (SGC)*, https://github.com/Ddey07/SGCTools, 2023.
2. **D. Dey** and A. Pita, *The Good, The Bad, and The Ugly of the Beautiful Game — Analyzing FIFA World Cup 2018 data*, https://ddey07.github.io/open-data/, 2018.

Books and Chapters

1. S. Deb and **D. Dey**, *Mathematical Techniques for Competitive Examinations*, English, Paperback, ISBN: 978-9393330109. URL: https://lead.to/amazon/com/?op=bt&la=en&cu=usd&key=9393330107.

Miscellaneous Experience

Awards and Achievements

- 2022 **Inducted into the Alpha chapter of Delta Omega**, national honorary society in public health.
- 2021 **Selected among top six presenters**, Opta Pro Fourm, 2021, one of the biggest soccer analytics conferences attended by professionals from over 80 clubs and federations worldwide.
- **Joint Statistical Meetings paper award**, *Section on Bayesian Statistical Science* of American Statistical Association.
- 2020 **Joint Statistical Meetings paper award**, *Section on Survey Research and Methods* of American Statistical Association.
- 2018 **Top five finalist**, US Soccer Hackathon 2018, Chicago, USA, July 14-15, 2018.
- 2012 **INSPIRE scholarship**, Department of Science and Techonology, Govt. of India.
- 2011 **Top 5%**, UNESCO Science Olympiad.
- 2011, 2012 **Awardee**, Regional Math Olympiad, India.

Conferences

- 2023 **JSM 2023**. Organized the session "Recent developments in methods for digital Brain Health data".
- 2022 **24th Anuual NIMH IRP Scientific Training Day**. Presented the poster *Influences of mood, energy and sleep on incident headache assessed with prospective real time electronic assessments*.
- 2021 **ICAMPAM 2021**. Presented the talk *Using Mobile Technologies to Investigate Impaired Sleep, Mood, and Energy as Real-Time Triggers of Migraine*.
- **MASS 2021**. Presented the talk *Modelling of mixed type intensive longitudinal data via Semiparametric Gaussian Copula and its application to real-time mobile monitoring of daily health behaviors*.

Teaching

- 2018-2019 Teaching assistant for Probability Theory I-IV, PH.140.721-724.
- 2019-2022 Teaching assistant for Statistical Methods in Public Health I-IV, 140.621-140.624.
- 2015-2017 Instructor at Ramanujan School of Mathematics for two years, giving lessons on advanced high school mathematics.

Mentoring

- 2020-2022 Mentor for final term Capstone projects for a diverse group of multi-ethnic international students (25 countries) from non-statistical backgrounds, taking the popular MPH course at Johns Hopkins Bloomberg School of Public Health.
- 2022-2024 Mentoring two PostBacs at NIMH - Ananya Swaminathan, Rene Chaudhuri on the statistical components of their projects.

Reviewer

- 2021– Journal of Computational and Graphical Statistics, Annals of Applied Statistics, Econometrics and Statistics, Mental Health and Physical Activity, TEST, Environmetrics, Sensors.

Skills

Languages	Strong reading, writing and speaking competencies for English, Bengali, Hindi.
Coding	R, Python, HTML, LaTeX

References

Dr. Vadim Zipunnikov, *PhD advisor*
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Dept. of Biostatistics
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Dr. Abhirup Datta, *PhD advisor*
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Dr. Kathleen Merikangas, *Postdoc advisor*
Chief of the Genetic Epidemiology Research Branch
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Dr. Sudipto Banerjee, *Collaborator*
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