

Daniel Andrés Díaz-Pachón

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Google Scholar

Education

Biola University <i>M.A. Science and Religion</i>	La Mirada, California 2021–
Universidade de São Paulo <i>Ph.D. Probability</i>	São Paulo, Brasil 2005–2009
Universidad Nacional de Colombia <i>B.S. Statistics (Minors: Mathematics, Biostatistics)</i>	Bogotá, Colombia 1998–2004
Facultad de Teología y Estudios Religiosos <i>B.A. Theology</i>	Bogotá, Colombia 1999–2005

Experience

Biostatistician <i>Miami Center for AIDS Research - University of Miami</i>	Miami, Florida 2022–
Biostatistician <i>Biostatistics Collaboration and Consulting Core - University of Miami</i>	Miami, Florida 2022–
Research Assistant Professor <i>Division of Biostatistics - University of Miami</i>	Miami, Florida 2015–
Postdoctoral Research Associate <i>Division of Biostatistics - University of Miami</i>	Miami, Florida 2011–2015
Risk Analyst <i>ACCION International</i>	Bogotá, Colombia 2008
Consultant <i>Universidad Nacional de Colombia</i>	Bogotá, Colombia 2003

Edition and translation

Book translator and editor <i>Freelance</i>	2004–2013
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More than 30 books translated or edited from English to Spanish for 3 different Publishing Houses.

Honors and awards

NSF travel award <i>Latin American Congress of Probability and Mathematical Statistics</i>	Cartagena, Colombia 2014
NSF travel award <i>Topics in Percolative and Disordered Systems, PASI</i>	Buenos Aires, Argentina; Santiago, Chile 2012
CAPES merit-based scholarship, Ph.D. in Probability <i>Instituto de Matemática e Estatística - Universidade de São Paulo</i>	São Paulo, Brasil 2009
Mensa member <i>High IQ society</i>	Worldwide 2004–
NSF travel award <i>Latin American Congress of Probability and Mathematical Statistics</i>	Punta del Este, Uruguay 2004
Scholarship, B.A. in Theology <i>Facultad de Teología y Estudios Religiosos</i>	Bogotá, Colombia 1999–2004
Merit-based scholarship, B.S. in Statistics <i>Universidad Nacional de Colombia</i>	Bogotá, Colombia 1999
Best admission exam, B.S. in Statistics <i>Universidad Nacional de Colombia</i>	Bogotá, Colombia 1998

Funded Research

- **Title:** Covid-19 testing bias with missing not at random data.
Funding Agency: Department of Public Health Sciences - University of Miami.
Role: Principal Investigator.
Dates: 03/02/2022 – 05/31/2022.
Reference: Copeland Foundation COVID19 Award Initiative 2022.
Total: \$10 000.
- **Title:** IUCRC Planning Proposal Grant University of Miami: Center for Standards and Ethics in Artificial Intelligence (CSEAI).
Funding Agency: National Science Foundation.
Role: Principal Investigator: 1,5% effort.
Dates: 02/15/2022 – 01/31/2023.
Reference: NSF 2137148
Total: \$20 000.
- **Title:** Measuring Fine-Tuning Using Maximum Entropy and Active Information.
Funding Agency: Walter Bradley Center for Natural and Artificial Intelligence.
Role: Principal Investigator: 25% effort.
Dates: 06/01/2020 – 06/31/2021.
Reference: AWD-005895.
Total: \$35 000.

- **Title:** Epigenetic biomarkers of response to azacytidine in myelodysplastic syndromes.
Funding Agency: NIH-NHLBI.
Role: Co-Investigator: 25% effort (4 months).
Dates: 06/01/2018 – 05/31/2019.
Reference: GR008159 NHLBI 7 R01HL 126947-03-669406
Total: \$390 375

- **Title:** Survival Bump Hunting for Finding Informative Subgroups in High Dimensional Data.
Funding Agency: NIH-NCI.
Role: Co-Investigator: 30% effort.
Dates: 03/01/2013 – 02/28/2017.
Reference: R01 CA16050593A1
Total: \$261 828.

Professional societies

IEEE Computational Intelligence Society, IEEE Computer Society, IEEE Information Theory Society, American Mathematical Society, Institute of Mathematical Statistics, American Statistical Association, INFORMS, Bernoulli Society.

Languages

Spanish: Native
English: Fluent
Portuguese: Fluent
Italian: Basic
Greek: Basic

Media appearances

4. [Researchers Develop a Mathematical Model for Knowledge Acquisition](#) **DPHS-UM**. December 20, 2022.

3. On fine-tuning. **Mind matters podcast** (four episodes):
 - [Why is there fine-tuning everywhere?](#) September 23, 2021;
 - [The universe is so fine-tuned!](#) September 16, 2021;
 - [Life is fine-tuned in a fearful and wonderful way.](#) September 9, 2021;
 - [Run the gambit of complexity.](#) September 2, 2021.

2. [Miller School Professors Develop Model To Correct COVID-19 Sampling Bias.](#) **InventUM**. February 11, 2021.

1. [Covid-19: How 900 bytes changed the world.](#) **Mind matters podcast**. April 23, 2020.

Publications

Key: * denotes student.

Journal and conference articles

15. Pablo Rivas, Jorge Ortiz, **Daniel Andrés Díaz-Pachón**, and Laura Montoya. Bridging Industry, Government, and Academia for Socially Responsible AI: The CSEAI Initiative. *2023 IEEE International Symposium on Ethics in Engineering, Science, and Technology (ETHICS)*. 1-1, 2023. [[Conference](#)].
14. Tianhao Liu*, **Daniel Andrés Díaz-Pachón**, J. Sunil Rao, and Jean-Eudes Dazard. High-Dimensional Mode Hunting Using Pettiest Components Analysis. *IEEE Transactions on Pattern Analysis and Machine Intelligence*. 45(4):4637-4649, 2023. [[arXiv](#)], [[Code](#)], [[Journal](#)].
13. **Daniel Andrés Díaz-Pachón**, Ola Hössjer, and Robert J. Marks II. Sometimes size does not matter. *Foundations of Physics*. 53(1), 2023. [[pdf](#)], [[Poster](#)], [[Journal](#)].
12. Pablo Rivas, Jorge Ortiz, **Daniel Andrés Díaz-Pachón**, and Laura Montoya. Planning a Center for Standards and Ethics in Artificial Intelligence. *Proceedings of the International Conference on Machine Learning Research*, 1-10, 2022. [[pdf](#)].
11. Ola Hössjer, **Daniel Andrés Díaz-Pachón**, and J. Sunil Rao. A Formal Framework for Knowledge Acquisition: Going Beyond Machine Learning. *Entropy*, 24(10):1469, 2022. [[PsyArXiv](#)], [[Journal](#)].
10. **Daniel Andrés Díaz-Pachón** and Ola Hössjer. Assessing, testing and estimating the amount of fine-tuning by means of active information. *Entropy*, 24(10):1323, 2022. [[arXiv](#)], [[Journal](#)].
9. **Daniel Andrés Díaz-Pachón**, Ola Hössjer, and Robert J. Marks II. Is cosmological tuning fine or coarse? *Journal of Cosmology and Astroparticle Physics*, JCAP07(2021)020, 2021. [[arXiv](#)], [[Journal](#)].
8. **Daniel Andrés Díaz-Pachón** and J. Sunil Rao. A simple correction for Covid-19 sampling bias. *Journal of Theoretical Biology*, 512:110556, 2021. [[arXiv](#)], [[Journal](#)].
7. **Daniel Andrés Díaz-Pachón** and Robert J. Marks II. Active Information Requirements for Fixation on the Wright-Fisher Model of Population Genetics. *BIO-Complexity*, 2020(4):1–6, 2020. [[arXiv](#)], [[Journal](#)].
6. **Daniel Andrés Díaz-Pachón** and Robert J. Marks II. Generalized active information: Extensions to unbounded domains. *BIO-Complexity*, 2020(3):1–6, 2020. [[arXiv](#)], [[Journal](#)].
5. **Daniel Andrés Díaz-Pachón**, Juan P. Sáenz, and J. Sunil Rao. Hypothesis testing with active information. *Statistics & Probability Letters*, 161:108742, 2020. [[arXiv](#)], [[Journal](#)].
4. **Daniel Andrés Díaz-Pachón**, Juan P. Sáenz, J. Sunil Rao, and Jean-Eudes Dazard. Mode hunting through active information. *Applied Stochastic Models in Business & Industry*, 35(2):376–393, 2019. [[arXiv](#)], [[Journal](#)].
3. **Daniel Andrés Díaz-Pachón**, Francisco J. P. Zimmermann, and Luis Alberto López-Pérez. F tests for the strip-split plot design. *Revista Brasileira de Biometria*, 34(2):279–303, 2016. [[arXiv](#)], [[Journal](#)].

2. **Daniel Andrés Díaz-Pachón**. Percolation for the stable marriage of Poisson and Lebesgue with random appetites. *Stochastics*, 85(2):252–261, 2013. [[arXiv](#)], [[Journal](#)].
1. **Daniel Andrés Díaz-Pachón**. A note on large deviations for the stable marriage of Poisson and Lebesgue with random appetites. *Journal of Theoretical Probability*, 25(1):77–91, 2012. [[arXiv](#)], [[Journal](#)].

Book chapters

1. **Daniel Andrés Díaz-Pachón**, Jean-Eudes Dazard, and J. Sunil Rao. Unsupervised Bump Hunting Using Principal Components. In S. Ejaz Ahmed, editor, *Big and Complex Data Analysis: Methodologies and Applications*, pp. 325–345. Springer International Publishing, 2017. [[arXiv](#)].

Submitted papers

4. Glauco Amigo*, **Daniel Andrés Díaz-Pachón**, and Robert J. Marks II. Forecast ergodicity: Prediction Modeling Using Algorithmic Information Theory. Submitted, 2023.
3. Ola Hössjer, **Daniel Andrés Díaz-Pachón**, Chen Zhao*, and J. Sunil Rao. An Information Theoretic Approach to Prevalence Estimation and Missing Data. *IEEE Transactions of Information Theory* (Second review), 2023 [[arXiv](#)], [[Code](#)].
2. J. Sunil Rao, Tianhao Liu*, and **Daniel Andrés Díaz-Pachón**. Back-to-the-future projections for COVID-19 surges. *PLOS One* (Second review), 2023. [[arXiv](#)], [[Code](#)].
1. Lili Zhou*, **Daniel Andrés Díaz-Pachón**, Chen Zhao*, and J. Sunil Rao. Correcting prevalence estimation for biased sampling with testing errors. *Statistics in Medicine* (Second review), 2023. [[medRxiv](#)], [[Code](#)].

Working papers

5. **Daniel Andrés Díaz-Pachón**, Ola Hössjer, and J. Sunil Rao. The role of active information in statistics.
4. Tianhao Liu*, **Daniel Andrés Díaz-Pachón**, and J. Sunil Rao. Dimension reduction for bump-hunting using mutual active information.
3. **Daniel Andrés Díaz-Pachón** and Alison Etheridge. Spatial Λ -Fleming-Viot process in discrete time.
2. **Daniel Andrés Díaz-Pachón**. Poisson multi-matchings.
1. **Daniel Andrés Díaz-Pachón**. Continuum percolation in high dimensions with random radii.

Non-peer-reviewed articles

2. **Daniel Andrés Díaz-Pachón**. On the Mind-Machine Problem. *Inference*. 5(2), May 2020. [[Journal](#)]. Written by invitation. Originally published in Spanish as: El desenlace del escritor [[Blog](#)].
1. **Daniel Andrés Díaz-Pachón**. Faith is the most fundamental of the mathematical tools. *MindMatters*. January 2020. [[Article](#)]. Originally published in Spanish as: De Hilbert y Gödel [[Blog](#)].

Dissertations.....

2. **Daniel Andrés Díaz-Pachón**. Advisor: Serguei Popov. Algumas propriedades de alocações para o processo pontual de Poisson. Doctoral dissertation (Portuguese). Instituto de Matemática e Estatística, Universidade de São Paulo, Brazil, 2009. [Tese](#).
1. **Daniel Andrés Díaz-Pachón**. Advisors: Luis Alberto López-Pérez, Francisco J. P. Zimmermann. Hipótesis lineales sobre medias para experimentos de franjas en parcelas divididas. Undergraduate dissertation (Spanish). Departamento de Estadística, Universidad Nacional de Colombia, 2004. [Tesis](#).

Invited talks and presentations

20. *Correcting prevalence estimation for biased sampling with testing errors* (Invited talk). **IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI'23)**. Pittsburgh, PA, USA. October 15-18, 2023.
19. *Concentración normal: Una introducción a la norma subgaussiana* (Spanish). [Seminario de estadística Statistics Department, Universidad Nacional de Colombia](#). Bogotá, Colombia. May 26, 2023.
18. *Active information, learning, and knowledge acquisition*. **Allen Discovery Center, Tufts University**. Boston, MA, USA. March 28, 2023.
17. *Size does not matter... sometimes*. **PLEP (Poster)**. Nazareth, Israel. May 9-12, 2022.
16. *Active information: Theory and applications*. **Department of Biostatistics, Florida International University**. Miami, FL, USA. March 24, 2022.
15. *A simple correction for COVID-19 sampling bias*. **CLADAG2021 (Plenary talk)**. Firenze, Italy. September 10, 2021.
14. *Active Information and some applications*. Colloquium, **Department of Mathematics, Florida International University**. Miami, FL, USA. October 24, 2019.
13. *Allocations: Some results and some open problems*. Probability Workshops, **Department of Statistics, Oxford University**. Oxford, England. June 13, 2016.
12. *On the explanatory power of Principal Components*. **XIII Latin American Congress of Probability and Statistics (CLAPEM)**. Cartagena, Colombia. September 25, 2014.
11. *Principal Components Analysis and Bump Hunting using PRIM*. Biostatistics Seminar, **Biostatistics Division, University of Miami**. Miami, FL, USA. September 14, 2013.
10. *Optimization of PRIM under normality*. **Sco 2013, Politecnico di Milano**. Milan, Italy. September 10, 2013.
9. *Optimization of PRIM under normality*. **Joint Statistical Meetings**. Montreal, Canada. August 5, 2013.

8. *Allocations: What they are and some open problems*. Graduate Seminar, **Department of Mathematics, University of Miami**. Miami, FL, USA. March 30, 2012.
7. *Grandes desvíos en el matrimonio estable de Poisson y Lebesgue con apetitos aleatorios*. Statistics Seminar, **Statistics Department, Universidad del Valle**. Cali, Colombia. May 10, 2011.
6. *Large deviations for the stable marriage of Poisson and Lebesgue with random appetites*. [Stochastic Processes Seminar](#), **Centro para la Optimización y la Probabilidad Aplicada, Universidad de los Andes**. Bogotá, Colombia. September 22, 2010.
5. *Tail bounds for the stable marriage of Poisson and Lebesgue with random appetites*. Seminar of theory and methods, **Statistics Department, Universidad Nacional de Colombia**. Bogotá, Colombia. September 6, 2010.
4. *Some properties of allocations with random appetites (Poster)*. **13th Brazilian Probability School**. Maresias, SP, Brazil. August 2–8, 2009.
3. *Percolación para asignaciones estables con apetitos aleatorios*. Stochastic Processes Workshop, **Mathematics Department, Universidad de los Andes**. Bogotá, Colombia. April 9, 2008.
2. *Percolación para el matrimonio estable de Poisson y Lebesgue con apetitos aleatorios*. Seminar of theory and methods, **Statistics Department, Universidad Nacional de Colombia**. Bogotá, Colombia. March 30, 2008.
1. *Hipótesis lineales sobre medias para experimentos de franjas en parcelas divididas*. **IX Latin American Congress of Probability and Statistics (CLAPEM)**. Punta del Este, Uruguay. March 22–26, 2004.

Teaching

Instructor.....

Advanced Survival Analysis

Ph.D. in Biostatistics - University of Miami
Martingales approach.
Created and taught.

Miami, Florida, USA
Fall, 2013–2016, 2018, 2020

Advanced Statistics and Probability

Ph.D. in Biostatistics - University of Miami
Measure-theoretic approach to asymptotics.
Created and taught.

Miami, Florida, USA
Spring 2013–2021

Intermediate Probability

Ph.D. in Biostatistics - University of Miami
Stochastic processes for biostatisticians.
Created and taught.

Miami, Florida, USA
Fall, 2017, 2019, 2021

Topics in Biostatistical Research

M.S./Ph.D. in Biostatistics - University of Miami
Philosophical foundations of mathematics, statistics, information, computation, and science.
Created and taught.

Miami, Florida, USA
Spring, and Fall 2017–current

Introductory Probability

M.S./Ph.D. in Biostatistics - University of Miami

Calculus based.

Created and taught.

Miami, Florida, USA

Fall, 2020–current

Probability and Statistics

Undergraduate - Instituto Politécnico Gran Colombiano

Counting approach.

Bogotá, Colombia

Spring and Fall, 2004

Teaching Assistant.....

Probability

Instituto de Matemática e Estatística - Universidade de São Paulo

Calculus based.

São Paulo, Brasil

2007

Administrative

M.S. Biostatistics Committee

Division of Biostatistics - University of Miami

Miami, Florida, USA

2015–current

Editorial

- **Peer-reviewer:**

IEEE Transactions on Systems, Man, and Cybernetics. IEEE Transactions on Information Theory. Bioinformatics Advances. International Journal of Epidemiology. Qeios. PLOS Computational Biology.

- **Associate Editor:**

Revista Colombiana de Estadística.
2013–current.

- **Scientific Committee:**

Comunicaciones en estadística
2008–current.

Certifications

- **Curso anual de novela.** Annual course on creative writing. *Escuela Cursiva.*

- **Taller de poesía con Carlos Pardo.** Four-months poetry course. *Escuela Cursiva.*

Interests

Creative writing and poetry.

Crossfit.

References

J. Sunil Rao

Professor and Director of Masonic Comprehensive Cancer Center,
Department of Biostatistics, University of Minnesota.

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Email: JRao@miami.edu

Robert J. Marks II

Distinguished Professor,
Electrical & Computer Engineering, Baylor University.

Phone: +1 (254) 710 7302

Email: Robert_Marks@baylor.edu

Ola Hössjer

Professor,
Department of Mathematics, Stockholm University.

Phone: +46 706721218

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