

Dr. Kobi A. Abayomi

CONTACT INFORMATION Head of Science
Gumbel Demand Acceleration
Adjunct Professor of Statistics & Data Science Faculty Council
Seton Hall University
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abayomko at shu dot edu
<https://www.shu.edu/profiles/abayomi.html>

RESEARCH WORK **Data Science:** Stochastic Processes, Bayesian Estimation, Imputation, Augmentation, Dimension Reduction, Machine Learning: Neural, Large Language, Multi-Layer, Time-Indexed Models
Music Information: Source Separation, Hilbert Space & Kernel Representations, Data Science for Digital Media
Probability & Statistics: Measurements of Inequality, Simplexed Distributions, Fixed Margin Distributions, Copulas, Hilbert Spaces, Probabilistic Metric Spaces, Probabilistic Search & Sort Algorithms
Environmental Science: Sustainability, Quotas, Stocks, Shares, Concentration, Resource Distribution
Economics: Inequality Metrics, Environmental & Ecological Economics, Labor Market Outcomes
Education: DFW/Grade Prediction, College Undermatching, Data Science Curriculum Design.

EARNED DEGREES **Columbia University**, Manhattan, New York USA

Ph.D., Probability and Statistics, Feb 2008
M.Phil., Statistics, May 2007
M.A., Statistics, February 2002

Georgia Institute of Technology, Atlanta, Georgia USA

B.S., Industrial Engineering & Public Policy, August 2000

POST-DOCTORATE TRAINING **Stanford University**, Palo Alto, CA USA, 2008

Duke University, Durham, NC USA, 2007-2008

EMPLOYMENT

Gumbel Demand Acceleration, San Diego, CA USA
Head of Science
2023-Present

Warner Music Group, NY, NY USA
SVP, Data Science & Analytics
2020-2023

WarnerMedia, NY, NY USA
Director, Linear & Cross Platform Monetization
2019-2020

Barnes & Noble Education, Manhattan, NY USA
Head - U.S. Data Science
2018-2019

Dun & Bradstreet, Short Hills, NJ USA
Senior Data Scientist
CEO's Office
2016-2018

Universidad de Cuenca, Cuenca, EC
Prometeo Professor
Facultad de Ingenieria
2014-2016

Binghamton University, Binghamton, NY USA
SUNY Faculty Professor
Environmental Studies Program &
Department of Mathematical Sciences
2012-2015

Duke University, Durham, NC USA
Visiting Research Fellow
Social Science Research Institute.
2011

Georgia Tech School of Industrial & Systems Engineering, Atlanta, GA USA
Assistant Professor
ISyE-Statistics
2008-2012

Stanford University, Palo Alto, CA USA
VIGRE Visiting Scholar
Department of Statistics
2008.

Statistical and Applied Mathematical Sciences Institute (SAMSI), Research Triangle Park, NC USA
Postdoctoral Associate
Risk working group. Bayesian/Multivariate Extreme Value Distribution theory
2007-2008.

Duke University, Durham, NC
Visiting Assistant Professor
Department of Statistics
2007-2008

Haverford College, Haverford, PA
Visiting Instructor
Department of Mathematics
2006-2007

University of Chicago, Chicago, Illinois USA
Research Intern
Center for Integrating Statistical and Environmental Science (CISES).
Spatial Covariance of Ground Level Ozone.
2004.

Center for International Earth Science Information Network (CIESIN) at Lamont-Doherty Earth Observatory, Columbia University. Palisades, NY USA
Research Associate
Global Disaster Risk Map; El Niño Drought Risk
2002
Research Assistant. Environmental Sustainability Index (ESI).
2000-2002

School of Industrial and Systems Engineering
Georgia Institute of Technology
Research Fellow
Extinction Risk/Probability under Repeated Jeopardy.
1999-2000

**School of Public Policy
Georgia Institute of Technology**

Research Assistant

Environmental Trade-Off in Post Soviet Bulgaria
1999-2000

PROFESSIONAL
AFFILIATIONS

Mechanical Licensing Collective (MLC)
Digital Data Exchange (DDEX)
American Statistical Association
INFORMS - Member since 2006
INFORMS - Minority Cluster Chair INFORMS 2009
INFORMS - Session Chair 2007-2012

SCHOLARLY
ACCOMPLISH-
MENTS:
PAPERS,
PATENTS—
REFEREED.

Abayomi K. “Modeling & Optimization for Streaming Listening Demand” accepted, to appear *Mathematics Association of America Monthly: Special Issue - Data Science*. 2024

Abayomi K., De Mori J., Liu Z “Open Set Recognition: An Engine for Automated Music Genre Discovery” *U.S. Provisional Patent Application Pending* (2022)

Abayomi K., Schwarm A. “Demand Based Marketing Analysis & Recommendation Engine” *U.S. Provisional Patent Application Pending* (2018)

Abayomi K., Scriffignano A. “Diagnostic Engine and Classifier for Discovery of Behavioral and other Clusters Relating to Entity Relationships to Enhance Modeling for De-Randomized Entity Behavior Identification and Classification” *U.S. Provisional Patent Application No. 62/368,457* (2016)

Girma A., Abayomi K., Garuba M. “The Design, Data Flow Architecture, and Methodologies for a Newly Researched Comprehensive Hybrid Model for the Detection of DDoS Attacks on Cloud Computing Environment.” In: Latifi S. (eds) *Information Technology: New Generations. Advances in Intelligent Systems and Computing*, vol 448. Springer (2016)

Hill, S., Vastola, J. & Abayomi K., “Statistics for Re-Identification in Network Models.” *Network Links: Connecting Social, Communication and Biological Network Analysis*. University of Minnesota Press. (2015)

Abayomi K., Pizarro, G. “Monitoring the United Nations Millennium Development Goals: A Simple (Bayesian) Methodology for a Cross-National Index”. *Social Indicators Research: Volume 110*, Issue 2 (2013), Page 489-515

Abayomi, K. and Yandle, T. "Using conditional Lorenz Curves to examine ITQ Consolidation in New Zealand Commercial Fishing." *Marine Resource Economics*. Volume **27**. pp 303-321. 2012.

Cao, F., Abayomi, K. and Gebraeel, N. "Probabilistic 'best set' sorting algorithms for multivariate prognostic data." *Algorithms and Computation* 2012.

Abayomi, K., Gabel J., Jennings, O. "Copula Based Multi-state Hazard Model: An Inferential Methodology for the Innocence Project." *JSM Proceedings, Statistical Computing Section*. Alexandria, VA: American Statistical Association August 2011.

Abayomi, K. "On Inequality" *Encyclopedia of Race and Racism*. **2nd edition**. Edited Volume, Editor in Chief: Mason, P. MacMillan Reference. 2012.

Abayomi, K., Thomas, V., and Luo, D. "Statistical Evaluation of the Effect of Ethanol in US Corn Production: A Kolmogorov-Smirnov Test for Independence on a Constrained Sum via the Empirical Copula." *International Journal of Ecological Economics & Statistics*. **20**. Winter 2011.

Abayomi, K., de la Pena, V., Lall, U., and Levy, M. "Quantifying Sustainability: Methodology for and Determinants of an Environmental Sustainability Index", chapter in *Green Finance and Sustainability: Environmentally Aware Business Models and Technologies*., ed. Z. Luo. 2010

Abayomi, K. and Hawkins, L. "Copulas for Tunable Markov Processes: Heuristics for extreme-valued labor market outcomes, for African American males. Fortune 500 CEO's vs. Professional Athletics" *Proceedings of the 2010 Joint Mathematics Meetings*. Spring 2009.

Sims, R.C., Madhere, S., Clark, E., Gordon, S., Abayomi, K.A., Callender, C.O., Campbell, A.L. Relationships between blood pressure, triglycerides, and verbal learning in African Americans, *Journal of the National Medical Association*., **102**. 2008

K Abayomi, A Gelman, M Levy "Diagnostics for Multivariate Imputation." *Journal of the Royal Statistical Society-C*. **57**, Part 3, 1-19. 2008

MC Thompson, K Abayomi, A G Barnston, M Levy, M Dille "El Niño and drought in southern Africa" *The Lancet*. **361**. February 1, 2003.

K Abayomi, R Barke, A Bostrom, S Gen, S Kapplin "Does Trust affect judgements of risk acceptability? A survey based case study from Burgas, Bulgaria." *Population and Environmental Psychology Bulletin*. **27**. No. 1, Winter, 2001.

Unpublished

Abayomi K., Baer P. “Statistical approximations for sustainably selective welfare functions.”

Abayomi, K., Darity Jr., W. “A Friendly Amendment of the Theil Index and a Consequent Test for Across and Within Theil Inequality.” (2011)

Abayomi, K., Gabel, D., and Jennings, O. “Determinants of Wrongful Conviction and Exoneration: A Statistical, Legal and Operational Study of Innocence Project Data.”

Abayomi K., Lacer, M., Lupton, D. “Thresholding for Multivariate Extreme Values applied to Environmental Hazards”

OTHER PUBLICATIONS

Abayomi, K. “Report: Determinants of College UnderMatching for High School Students in the New York City Department of Education, with Case-Control Addendum” (2017)

Abayomi, K. “United Nations Millennium Development Goals Prediction & Visualization Module; Univariate & Multivariate Predictions” (2015)

Pizarro, G., Abayomi, K. et. al “The Millennium Development Goals Systematic Time-bound Evaluation of Performance and Systems (STEPS) Index.” United Nations Development Program, Millennium Development Goals. *Working Paper*. 2009.

K Abayomi, U Lall, V De la Pena “Copula based Independent Component Analysis.” *Ph.D Thesis, Columbia University* 2008.

World Bank-SEDAC Report “Natural Disaster Hotspots: A Global Risk Analysis” *Technical Report*.

Abayomi, K. “Multivariate time series: Ground Level Ozone” Chicago, CISES - University of Chicago: 11. 2004.

Abayomi, K., “Bayesian Network Analysis of Multiple Hazards: Initial Example” ProVention Consortium Assessment of High-Risk Disaster Hotspots, Palisades, N.Y. November 2002.

Available at http://www.proventionconsortium.org/files/hotspots2002/abayomi_lall.pdf

World Economic Forum. 2002 Environmental Sustainability Index.

Available at <http://www.ciesin.org/indicators/ESI/downloads.html>

World Economic Forum 2001 Environmental Sustainability Index.
Available at <http://www.ciesin.org/indicators/ESI/downloads.html>

REFEREE
ACTIVITY

Statistics and Computing

Marine Resource Economics

Journal of Policy Analysis and Management

Annals of Operations Research

Computational Statistics and Data Analysis

International Journal of Health Geographics

International Statistical Review

Fonds de recherche sur la nature et les technologies de Québec.

Electronic Journal of Statistics

IEEE Transactions on Neural Networks

Environmental Science and Technology

Statistica Sinica

PRESENTATIONS Chan Stanek Lecture MAA Joint Meetings. “From Sound to Demand - What a DJ knows. An RKHS approach to demand representation from sound information.” Invited Talk. August 2024

CUNY/Hunter College Statistics Seminar. “From Sound to Demand - What a DJ knows.” Invited Talk. February 2024

Mathematical Association of America Joint Meetings. “From Sound to Demand - What a DJ knows.” Invited Talk. August 2023

INFORMS 2022. “Hierarchical modeling for digital media demand.” Invited Talk. November 2022.

AUC Data Science Colloquium. “Hierarchical modeling for digital media demand.” Invited Talk. January 2022.

RStudio Forum: Data Science Business Leaders. Invited Panel. March 2021

“Statistics in Data Science” Invited Talk. Columbia University GSAS Seminar. January 2021

“Statistics in Data Science” Invited Talk. Columbia University Student Seminar. December 2020

“Natural Language in B2B Unstructured Data” Invited Talk. Seton Hall University. May 2018

“Beyond Correlation” Invited Talk. Morehouse College. May 2016

“Further Beyond Correlation” Invited Talk. Oberlin College - Series in Science. April 2016

“Non-Gaussian Computer Experiments” Invited Talk. Universidad de San Francisco de Quito. Quito, Ecuador. July 2014.

“Statistical Methodology for Innocence Project Data.” Invited Talk. American Society of Criminology. Chicago, USA. November 2012.

“Probabilistic Versions of ‘Best Set’ Sorting Algorithms, with Measure Theoretic Limits Using Copulas”. Invited Talk. INFORMS, Phoenix AZ. November 2012.

“Beyond Correlation” Invited Talk. Oberlin College. October 2012

“Statistical Approaches for Constrained/Limited Sums.” Invited Talk. Georgia Tech Economics Department Seminar. January 2012.

“Statistics in Social and Environmental Good(s)”. Invited Talk. Morehouse College Mathematics Seminar. September, 2011.

“Conditional Lorenz Curves for Inequality Data” Duke Conference on Health and Inequality Measurement. August 2011.

“Multi-State Hazard Models for Exoneration Data” with J. Gabel and O. Jennings, Invited Talk, Joint Statistical Meetings, August 2011.

“Statistics for Re-identification in Networked Data” with Justin Vastola and Shawndra Hill, Invited Talk, Baruch College, May 2011.

“Understanding change in Individual Tradable Quotas (ITQs): A spatial analysis of ITQ ownership in New Zealand inshore fisheries”, Invited Talk, North American Association of Fisheries Economists, April 2011.

“Statistics for Sorting Multivariate Prognostic Data.” with Fang Cao and Nagi Gebrael, Invited Talk, INFORMS 2010

“A Straightforward Bayesian Approach to Indexing: The Millennium Development Goals” with Gonzalo Pizarro, Invited Talk, INFORMS 2010

“Theil’s Index and a Test for Equi-Inequality.” with William Darity, Jr., Invited Talk, INFORMS 2010

“Statistics for Re-identification in Networked Data” with Justin Vastola and Shawndra Hill, Invited Talk, INFORMS 2010

“Competition in Corn Yield from Ethanol Biofuel Production” with Dexin Luo and Valerie Thomas, Invited Talk, INFORMS 2010

“Multivariate Extreme Value Thresholding.” with Drew Lupton, Invited Talk, INFORMS 2010

“Theil’s Index and a Test for Equi-Inequality.” with William Darity, Jr., Invited Talk, Hendricks Symposium 2010

“Statistics for Re-Identification Signatures in Networked Data.” Vastola, J., Abayomi, K. and Hill, S. ‘ *WIN Workshop on Information Networks* 2010.

“Theil’s Index and a Test for Equi-Inequality. Invited Talk, Duke University, March 2010

“Statistics in Forensic Analysis.” Invited Talk, Georgia State University College of Law, March 2010.

“Copulas for Tunable Markov Processes.” Invited Talk, Joint Mathematics Meetings. Jan 2010.

“Dependency/Competition in Corn Yield: A Proxy for Land Use Change.” ISYE-Stats Seminar. Fall 2009

“Indexing Methodology for Millennium Development Goals”, Invited Talk: Pizarro, G., Abayomi, K. and Chen, Y., INFORMS 2009.

“A Friendly Amendment of the Theil Index.” Contributed Talk, INFORMS 2009.

“Copula Based Independent Component Analysis.” Invited Talk. Georgia State University Statistics Seminar. Spring 2009.

“Copula Based Independent Component Analysis.” Invited Talk. City University of New York Statistics Seminar. Fall 2008.

“Sustainably Selective Welfare Functions.” Contributed talk. INFORMS 2008, section on Environmental and Economic Statistics.

“Copula Based Independent Component Analysis.” Invited Talk. Delivered at 2007 INFORMS, Data Mining Section. Seattle, WA.

“Statistical approximations for sustainably selective welfare functions.” Contributed Talk. Delivered at 2006 INFORMS, Statistics Section. Pittsburgh, PA.

“Copula methods for flood forecasting.” Invited Talk. Delivered at 2005 INFORMS, Environmental Data Mining Section. San Francisco, CA.

“Using Software to Estimate Copulas.” Invited Talk. Delivered at Risk Seminar, October 2005, Columbia University. Manhattan, NY.

“Divining Dependency from Bayesian Networks.” APAM/IGERT Seminar, October 2005, Columbia University. Manhattan, NY.

“Expedient Methods in Environmental Indexing.” Delivered at JSM 2005. Minneapolis, MN.

“Expedient Methods in Environmental Indexing” Invited Talk. Delivered at 2004 INFORMS, Environmental Data Mining Section. Denver, CO.

“Bagging Bayesian Networks: Determinants of Disaster Risk” Delivered at 2004 CAARMS. Berkeley, CA.

A Bostrom, R Barke, S Gen, K Abayomi, S Kapplin “Sustainability and Transformation at the Local Level in Post-Socialist Bulgaria: The Case of Burgas” Delivered at the Bulgarian Research Symposium May 2000. Atlanta, GA.

Available at <http://cherry.iac.gatech.edu/bg/sym/proceed/bostrom.pdf>

A Bostrom, R Barke, S Gen, K Abayomi, S Kapplin “Economic and Environmental Risk Tradeoffs” Delivered at the 1999-2000 Society for Risk Analysis, Atlanta, GA.

“Bayesian Network Analysis of Multiple Hazards: Initial Example” Invited Talk. Delivered at ProVention Consortium Assessment of High-Risk Disaster Hotspots, Palisades, N.Y. November 2002.

Available at http://www.proventionconsortium.org/files/hotspots2002/abayomi_lall.pdf

Environmental Sustainability Index Methodology Workshop. October 2001. Cambridge, MA.

SERVICE -
PROFESSIONAL
AND CAMPUS

Chapter Advisor, AI 2030, 2024-Present

Board Member, Ivan Allen College, Georgia Institute of Technology, 2021-Present

Board Member, Modal Learning, 2021-Present

Board Member, Barnes & Noble Education, 2021-Present

Division of Mathematical Sciences, National Science Foundation, Statistics Panel. 2012

Prisoner Representative, Georgia Tech Institutional Review Board, 2011-2013

Session Chair, Statistical Approaches in Data Mining, INFORMS 2011

Session Chair, Statistical Approaches in Data Mining, INFORMS 2010

Session Chair, Statistical Issues in Public Policy, INFORMS 2010

Cluster Chair, Minority Issues Forum, INFORMS 2009

Session Chair, Environmental and Economic Statistics, INFORMS 2008

Session Chair, Environmental Statistics, INFORMS 2007

SERVICE -
CAMPUS

Data Science Advisory Council; Seton Hall University, 2018-Present

Curriculum Design: Masters of Data Science, Data Science for Digital Media; Seton Hall University, 2023

Curriculum Design: Masters of Data Science, Statistics Sequence; Seton Hall University, 2017-2018

Georgia Tech SURE Faculty Mentor, Summer 2009.

ISYE Workplace Communication Lab 1-on-1 presentation sessions for ISYE 2028A and B, Spring 2009.

GRANTS,
CONTRACTS,
OTHER

Principal Investigator, on *Early Behavioral Determinants of Psoriatic Arthritis*, **No-vartis Pharmaceuticals**. August–November 2019.

Principal Investigator, on *College Undermatching*, **New York City Department of Education (NYCDOE)**. September–December 2016.

Principal Investigator, on *Multivariate Production Process Control Statistics*, **Kedrion Pharmaceuticals**. September–December 2015.

Principal Investigator, on *Aggregating determinants of MDGs*, **United Nations Development Programme, LATAM**. January–May 2015.

Principal Investigator, on *Application to Predict Millennium Development Goals*, **United Nations Development Programme**. May–December 2014.

Principal Investigator, with Jessica Gabel and Otis Jennings, on *Determinants of Exoneration*, using the Innocence Project Network Data. **GT-FIRE**. March 2010–2011.

Consultant on Duke University Research Network on Racial and Ethnic Inequality National Asset Scorecard. PI: Dr. William Darity Jr. **Ford Foundation**. 2010–2011.

Summer funding for Ph.D. student Justin Vastola’s work on “Statistics for Signal Re-Identification in Networked Data.” (with Shawndra Hill). **Office of Naval Research**. Summer 2010.

Consultant on *Weighting Methodology for United Nations Development Program, Millennium Development Goals Index*. **UNDP**. Fall 2009.

National Science Foundation, VIGRE visiting scholar at Stanford University Statistics Department. Summer 2008.

National Science Foundation, IGERT Scholar/Doctoral Fellow (Columbia University). 2003–2006.

HONORS AND AWARDS

Alumni of the Year Georgia Institute of Technology, Ivan Allen College. 2021

Adjunct Teacher of the Year Seton Hall. 2016–2017

Class of 1969 Teaching Fellow Georgia Tech. 2011–2012.

GT-FIRE Program to Support Innovative Research. 2010–2011

Young Practitioner INFORMS Conference on Practice, Applying Science to the Art of Business. 2009

VIGRE Fellow Stanford University Statistics Department. Summer 2008.

SAMSI Postdoctoral Fellow Statistical and Applied Mathematical Sciences Institute (SAMSI). Research Triangle, NC. 2007-2008

CFD Predoctoral Fellow. Haverford College. 2006-2007

IGERT Fellow. National Science Foundation Integrative Graduate Education and Research Traineeship (IGERT) in the Mathematical and Earth Sciences. 2003-2007.

Best Algorithm. CAARMS. June 2004.

REU Fellow. National Science Foundation Undergraduate Research Fellowship. 1999-2000

HOPE Scholar. Georgia Institute of Technology. 1998-2000.

TEACHING
EXPERIENCE

Seton Hall University, South Orange, NJ

Spring 2016-Present Statistics for Biologists - Math 2111NA, Mathematical Statistics - Math 3711, Statistics for Data Science - Math 6611, Operations Research for Data Science - Math 6811, Data Science for Digital Media - TBA

Universidad de Cuenca, Cuenca, Ecuador

Probabilidad y Estadística para Aprendizaje Automático.

Binghamton University, Vestal, NY

Differential Equations, Math 371, Probability, Math 501, Finite Sampling, Math 445, Measure Theoretic Statistics, Math 502

Georgia Tech, Atlanta, GA

Design of Experiments, ISYE 6413, Linear Statistical Models, ISYE 6414, Linear Statistical Models, ISYE 6414. Basic Statistical Methods, ISYE 2028, Statistical Dependency, ISYE 8803. Linear Statistical Models, ISYE 6414, Basic Statistical Methods, ISYE 2028, Discrete Math.

Duke University, Durham, NC

Introduction to Statistics, Introduction to Probability.

Haverford College, Haverford, PA

Applied Dependency Modeling. Stochastic Processes.

Columbia University, Manhattan, NY

Graduate Mentor, Summer Undergraduate Research Program, Introduction to Statistics for Engineers, Introduction to Statistics, Advanced Differential Calculus, Minority Pre-Freshman Summer Program for Engineers, Introduction to Statistics.

Morehouse College, Atlanta, GA

Introduction to Calculus.

CITIZENSHIP,
LANGUAGES,
REFERENCES

United States Citizen, Work Visa - Ecuador, Native English, Conversational Spanish.
Dr. Erica Walker, Professor, Teacher's College, dean.oise@utoronto.ca
Dr. Gonzalo Pizarro, Director, Latin American Program, gonzalo.pizarro@un.org
Dr. Joseph Zhou Director of Risk and Credit, Access Financial/TEMPOE, LLC,
junlizhou@yahoo.com