Dr. Ami Gates

Ph.D. Computer Engineering and Data Science

PROFESSOR
APPLIED MATH & DATA SCIENCE

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MathAndStatistics.com

GatesBoltonAnalytics.com

SUMMARY

Dr. Gates is a Principal Professor in the Applied Math Department at the University of Colorado, Boulder. Dr. Gates teaches and develops courses. SME includes Data Science, Neural Networks, Machine Learning, Text Mining and NLP, Data Visualization, Applied Math, and Statistics. Before assuming the current role of Professor at CU Boulder, Dr. Gates served as **Director and Professor for the Georgetown University Data Science and Analytics Program** for several years. Dr. Gates has over 20 years of experience and expertise in teaching and student support (online/digital and traditional), program and product inception-to-production, management and leadership, team building, administration, CRM, development and learning-experience design, and data and performance analytics. Dr. Gates has a PhD in Computer Engineering and Data Science.

EDUCATION

Doctor of Philosophy Computer Engineering
University of Florida, Dec.2008

Dissertation Publication: *Protein Secondary Structure Prediction Using a Machine Learning Ensemble*
Focus: *Data Science, Analytics, Machine learning, Data Mining, Support Vector Machines, Bioinformatics.*
http://ufdc.ufl.edu/UFE0023862/00001

Service & Awards:
University of Florida Presidential Recognition Award
University of Florida Graduate Fellow and TA
Computer Science Graduate Student Organization President
Industrial Advisory Board Graduate Representative
Woman in Engineering ACM Speaker
Children's Cancer Volunteer
"Learn to Read" Volunteer
Welfare-to -Work (4 years with highest job success rate

Master of Science
Computer Information Science & Engineering
University of Florida, Dec.2002

Master of Science Education
Nova Southeastern University, Dec.1997

Bachelor of Arts Mathematics
Florida Atlantic University, Dec.1991

EXPERIENCE

Principal Teaching Professor, Department of Applied Math and Data Science

University of Colorado, Boulder (2022-present)

Dr. Gates teaches and develops courses, serves as a faculty mentor, assists with several administrative tasks and events, and supports student learning and success. Dr. Gates developed and teaches graduate level courses in the areas of Data Science, Machine Learning, Neural Networks, Text Mining and NLP, Statistics, Programming in R and Python, Data Visualization, and related advanced math.

Director and Full Teaching Professor, Data Science and Analytics

Georgetown University, Washington, DC (2015-2022)

As the Director of Data Science and Analytics at Georgetown University, Washington DC, Dr. Gates owned, lead, managed, and developed all aspects of the program including team building, hiring, support, and mentorship, academic product planning and design (inception to execution), program analytics and decision-making, advertising, admissions, budget management, student support, technological advancements, curriculum development and delivery (remote and traditional), and instruction (remote and traditional).

Georgetown is a highly matrixed organization with a range of cross-functional departments, programs, and administrative teams. Dr. Gates established and executed methods and models to assure program excellence, growth, rigor, and achievement, developed and supported a high-performing faculty team, encouraged engagement and research, and promoted inclusion, diversity, and equality. These policies and practices resulted in transforming the Data Science Program into the largest MS program in Georgetown's Graduate School of Arts and Sciences.

Additional Graduate Courses

- *STA 6166 Statistical Methods I*
- *STA 6167 Statistical Methods II*
- *STA 6329 Statistics and Linear Algebra*
- *MAA 6236 Mathematical Analysis for Statistics*
- *STA 6326 Theoretical Statistics I*
- *MAT689 Probability and Statistics*
- *CAP 6610 Machine Learning*
- *BIST 510 Adv. Probability Theory*
- *BIST 515 R and SAS Programming for Data Analysis*
- *BCH 6206 Advanced Bio Metabolism (including protein dynamics)*
- *BCH 6415 Advanced Molecular and Cellular Biology (with Virology)*
- *BCH 6156 Research Methods in Biochemistry*
- *BCH 6296 Advanced Topics in Metabolic Control*
- *CIS6930 Computational Neuroscience*
- *BCH 6936 Biochemistry Seminar*
- *EME 6405 Educational Technology in Teaching*

In addition to directorship and management, Dr. Gates regularly developed and taught classes in the areas of Data Science and Analytics (including Machine Learning and Deep Learning, Data Science Lifecycle, Text Mining and NLP, Data Visualization, Data Communication, Statistical Modeling), Programming, such as R and Python, C++, Java, Computer Science/IT (such as Data Structures, Algorithms, Full Stack Web Development, Database, etc.), and Math and Statistics (several areas). Student reviews are exemplary and available upon request.

Instruction & Development (Traditional and Online/Remote)

- Data Science and Analytics
- Data Mining (R and Python)
- Text Mining and NLP (R and Python)
- Data Visualization (R, Python, Interactive, Tableau, etc.) & Image Analytics
- Programming (R, Python, C++, Java) & Data Structures and Algorithms
- Probability and Statistics & Statistical Modeling
- Database/SQL/NoSQL (Amazon Dynamo, MongoDB)
- Cloud Computing Services/AWS

PUBLICATIONS

A. Gates, "State of the Art Protein Secondary Structure Prediction Using a Novel Two-Stage Alignment and Machine Learning Method" *Dissertation Publication: University of Florida Library,* 2008

A. Gates, "The Future of Learning and Teaching Math and Statistics: A Video is Worth 1000 Pages", *Center of Teaching and Learning Educational Conference,* 2012

A. Gates and T. Kelley, "Step Ahead with Pre-Term Proactive Outreach: Getting Learners Ready for Day 1", *Center of Teaching and Learning Educational Conference,* 2012

A. Gates and M. Lis, "Preterm Outreach and the Instructor Live Binder (ILB) Initiative" *Virtual General Education Conference Innovative Strategies,* 2013

J. Bolton, P. Gader, and **A. Gates**, "Embedding Multiple Instances: Applications to Hyperspectral Image Analysis", *Proceedings of the IEEE Workshop on Hyperspectral Image Signal Processing: Evolution in Remote Sensing*, Gainesville, 2013

P. Hohensee, L. Johnson, **A. Gates**, "Leveraging Google Apps to Enhance Online Learning in Mathematics", *AMAYTC: American Mathematical Association of Two Year Colleges,* 2014

A. Gates, "Methods of Statistical Analysis Using Google Form Data and Excel", *Center for Teaching and Learning Conference*, Kaplan University, 2014

A. Gates, R. Lockwood, "Methods and Perceptions of Grading: A Balanced Approach", *Kaplan General Education Conference*, 2014

J. Bolton, **A. Gates**, "Utilizing Google+ and Google Sites for Improved Course Leadership, Mentorship, and Collaboration", *Kaplan Virtual Education Conference*, 2014

Visiting Professor, School of Information Studies (Online), Applied Data Science

Syracuse University, Syracuse, NY (2017 - 2022)

As a member of the Syracuse University Online team, Dr. Gates teaches, develops, and creates code and examples in R and Python. The following offers a list of courses taught and the general content.

Instruction (Online/Remote)

- **Machine Learning**
  - R and Python/Sklearn
  - Unsupervised:
    - Association Rule Mining/apriori
    - Text Analytics
    - Clustering (several)
    - Visualization
  - Supervised
    - Decision Trees
    - Naïve Bayes
    - Support Vector Machine
    - ML Ensembles
    - Regression (several)

- **Text Mining and NLP**
  - Text Management in Python
    - CountVectorizer/TfidfVectorizer
    - Sentiment Analysis
    - Topic Modeling and LDA
    - Twitter Mining
    - N-grams
  - Corpus Analytics in R
  - Machine Learning for Text Data

A. Gates, "eBook: (MOOT) Video and Visual Textbook for Introduction to Statistics", http://www.mathandstatistics.com/introduction-to-statistics-video-moot, 2014

Invited Speaker Series: Kaplan University, "The Development and Utilization of Google Communities in Faculty Support and Professional Development", **A. Gates**, 2015

Conference Session Host: Kaplan General Education Conference 2015, 2016

Gates, A. & Bolton, J. , The Effectiveness of Twitter as an Adjunctive Pedagogical Tool for Online Statistics Education: An Empirical Study. In *Proceedings of Society for Information Technology & Teacher Education International Conference* (pp. 2834-2840). Chesapeake, VA: Association for the Advancement of Computing in Education (AACE/SITE) 2015.

A. Gates, Developing and Sharing Asynchronous, Personalized, and Interactive Learning Solutions: An E-Learning Workshop for Interactive Google, *AACE Association for Advancement in Computing, eLearn World Conference, Washington, DC* 2016

A. Gates, "Statistics Education: Directed Personalized Learning with Video-Supported Interactive Google Forms", *Kaplan General Education Conference*, 2016

A. Gates, "Scholarship Methods: From Statistical Analysis to Time Management", *Kaplan Virtual Education Conference*, 2016

A. Gates, "Programming in R and Exploratory Data Analysis", *CAPWIC: 2017 ACM Capital Region Celebration of Women in Computing Conference*, Workshop, 2017

A. Gates, "Research Case Studies: Exploratory Data Analysis Using Excel", *Kaplan General Education Conference*, 2017

A. Gates, "Association Rule Mining With Tweets: Thinking Outside the Basket", The 2018 Washington DC R Conference, 2018

A. Gates, "Using NetworkD3 and R: Visualize and Explore Relationships in Data", The 2019 Washington DC R Conference, 2019

A. Gates, "The Mathematics of Growth", The MedStar MI2 Annual Conference and Forum, 2019

Books and Channels:

1) MathAndStatistics.com
2) GatesBoltonAnalytics.com
3) YouTube Learning Channel: ProfessorAmiGates (1.1+ Million views)

MEMBERSHIPS

- Advisory Board Member for The Data Community DC: http://www.datacommunitydc.org/
- American Statistical Association (ASA)
- Institute of Electrical and Electronic Engineers (IEEE)
- Association for Computing Machinery (ACM)
- ACM Capital Region Celebration of Women in Computing Conference (CAPWIC)
- Association for the Advancement of Computing in Education (AACE)

Visiting Research Scientist with SMART Group Johns Hopkins

Johns Hopkins Bloomberg School of Public Health: (2015 –2017)

Project Description: The utilization of independent component analysis methodologies, combined with the exploitation of information gained from potential brain homotopy and symmetries, in the design and development of a novel gICA method (H-gICA). This project focused on the development of a new group ICA approach, Homotopic Group ICA (H-gICA), for use on blind source separation of resting state functional magnetic resonance imaging (fMRI) data. Brain functional homotopy is the high degree of synchrony in spontaneous activity which exists between geometrically corresponding inter-hemispheric regions. The project utilized information intrinsic to brain homotopy to advance network estimates and discover, as well as computational efficiency.

RE: http://www.smart-stats.org/

Manuscript: *In Progress* Juemin Yang, Ani Eloyan, **Ami Gates**, Anita Barber, Mary Beth Nebel, Stewart Mostofsky, James Pekar, Ciprian Crainiceanu, Brian Caffo. "Homotopic Group ICA for Multi-Subject Brain Imaging Data"

Visiting/Adj. Professor, School of Information Studies (Online), Applied Data Science

South New Hampshire University (Online) (2013 - 2022)

As a member of the SNHU team, Dr. Gates developed and regularly teaches graduate Statistics for Social Sciences.

Instruction (Online/Remote)

- Statistics for Social Science

Visiting Professor, Data Analytics Program (Online)

University of Maryland – Online Global Campus (2017 -2022)

As a member of the UMGC team, Dr. Gates teaches graduate machine learning and participates in development, course updates, and resource building.

Instruction (Online/Remote)

- Machine Learning (in R)

Full Professor of Mathematics and Statistics

Purdue Global/Kaplan University (2011 - 2018)

As a member of the Kaplan (now Purdue Global) team, Dr. Gates taught and developed graduate and undergraduate classes, mentored new faculty, offered leadership and service, and engaged in program analytics.

Instruction (Online/Remote)

- Graduate Applied Statistics for Psychology and Social Science Research (SPSS)
- Undergraduate Statistics (Excel)

Course Development

- Graduate Applied Statistics for Psychology and Social Science Research with SPSS (eCollege) (SME)
- Statistics with Excel (eCollege) (SME)

INDUSTRY EMPLOYMENT

Project Manager
Aquinity Interactive, Inc. (2001 - 2002)

Daily Tasks:

- Programming: C#/.Net, SQL,Python/ IronPython
- Technical training
- Technical writing
- Team building
- General and product management
- Technical, code, and framework documentation

Project Manager, Programmer, and Mathematician
Mitsubishi Power Systems (2000-2001)

- Database analysis and development (Oracle 9i, PL/SQL, XML)
- Performance Tuning on 35 million inserts per day into Oracle database. Fine-tuned SQL statements and processing to allow fast retrieval of data without affecting the insertion and deletion speed.
- Real-time data flow analysis of database with 24/7/365 uptime. Performed statistical analysis of every critical point of data flow.
- Numerical and statistical analysis (prediction analysis, pattern analysis, assessment)
- Created graphical Java/Swing applets integrated with PL/SQL to dynamically generate radar charts, 3D bar graphs, line graphs, scatter plots based on real-time streaming data from Oracle Database.
- Web and graphical development (Perl, Java, JavaScript, Flash, C++)
- Development of Mitsubishi's dynamic website using Oracle Portal, JavaScript, DHTML menus, Oracle Portal SSO, Java graphing applets.
- Developed Mitsubishi Power System's commercial website using PL/SQL, DHTML, XML, Java servlets, JSP.
- Management and Integration
  - Multiple departmental specification integration
  - International cooperation and coordination
  - Team management

- Statistics for Health Sciences

Leadership & Service

- Course Lead: Graduate and Undergraduate Statistics
- New Faculty Mentor
- Publication and Presentation Committee Leader

Innovation and Research

Engaged in on-going, but proprietary program analytics, research, and development involving novel and effective methods and models for virtual and technology-based learning environments, adjunctive technology-based learning tools, adaptive and personalized learning methods, modularization and self-directed learning, as well as faculty and student support and retention methods.

Faculty Development and Support

Development and management of the **Publication Group**, a support and team-building g+ Community to facilitate and promote publication and presentation partnerships, collaboration, and inclusion.

Visiting Professor of Computer Science and Statistics
Florida Technical University (Online) (2004 -2022)

As a member of the FIT team, Dr. Gates taught courses in the areas of statistics and computer science.

Instruction (Online/Remote)

- Statistics
- Computer Programming (C++, VB, Java, Python)

Computer Science and Statistics Instructor and Developer
University of Florida (1999 – 2008, 2012) (Traditional)

As a member of the UF team, I taught and developed several undergraduate classes.

Instruction (Traditional)

- Discrete Math (C++)
- Numerical Methods (C++ and MATLAB)
- Statistics
- Operating Systems (UNIX)
- Problem Solving Using Computer Software and IT(C++/Java)

Senior Teaching Professor, Computer Science Department
Florida Atlantic University (1999 – 2002)

As a member of the FAU team, I taught and developed several undergraduate classes.

Instruction (Traditional)

- Analysis of Algorithms
- Formal Languages and Computation Theory
- Database (SQL, Oracle)
- Internet Programming (XHTML/DHTML,CSS, XML, XSL, JavaScript, Perl/CGI)
- Data Structures and Algorithms
- Software Engineering

Software Engineer and Web Developer
Citrix Systems (1999-2000)

Global Engineering web site design and development.

- Developed for the design of internal / external company web pages, including graphics, animation, and functionality.
- Developed web page infrastructure and applications related to pages with more advanced graphics and features.
- Maintenance of web server and site technical performance.
- Developed, accessed, and communicated web site usage and security policies and standards

Tech: *Perl, R, Python, CGI, DHTML/CSS, JavaScript, ASP, XML/XSL. Citrix MetaFrame 2.0, Nfuse 1.8, MS Windows NT Server 3.51& 4.0,MS SQL, MS Visual Basic, ASP, MS IIS, Active-x, ADO, RDBMS design*

VOLUNTEER

- Welfare to Work Program
- Children's Cancer Volunteer
- Special Instruction for Visually Impaired
- **YouTube Channel**: ProfessorAmiGates
- Personal Site: www.MathAndStatistics.com
- Free open eBook: http://www.mathandstatistics.com/introduction-to-statistics-video-moot
- CTU Mentorship Program

REFERENCES

- **Dr. Jane Wall,** Director of Data Science, University of Colorado, Boulder, CO, j.wall@colorado.edu
- **Dr. Osita Onyejekwe,** Assistant Teaching Professor, University of Colorado, Boulder, Osita.Onyejekwe@Colorado.edu
- **Dr. Purna Gamage,** Director and Teaching Professor of Data Science and Analytics, Georgetown University, Purna.Gamage@georgetown.edu
- **Dean Alex Sens,** Dean Graduate School of Arts and Sciences, Georgetown University, sensa@georgetown.edu, 202-687-7634
- **Dr. Paul Bohman**, Director of Training, Deque Systems and Adjunct Professor Georgetown University, Washington DC, Paul.Bohman@deque.com, 703-930-8500
- **Lauren Juiliani, Program Manager, M.S. Applied Data Science**/Enterprise Data Systems/Information Management, School of Information Studies, (315) 443.4229, lkjuilia@syr.edu , 110 Hinds Hall, Syracuse, NY 13244, ischool.syr.edu, Syracuse University
- **Dr. Rob Segan**, Head of Technical Direction, Data Elevates (703)-678-4752, rsegan@dataelevates.com

Mathematics and Statistics Teaching Professor
Nova Southeastern University (1997 - 1999)

As a member of the NSU team, I taught and developed several graduate math and statistics classes.

Instruction (Traditional)

- Statistics
- Discrete Mathematics
- Analysis of Calculus
- History of Math
- Linear Algebra
- Number Theory

AWARDS

- Teacher of the Year Award, Florida Technical University, College of Engineering and Science, Award presented by: Dr. Phil Bernhard, Director, School of Computing, FIT
- Dedicated Faculty Award (to student engagement and success)
- General Education Promotion and Information Video Award
- Scholarship Award Nominee
- Faculty Spotlight for Excellence
- Outstanding Full Time Faculty Member for the School of General Education
- Educator of the Year Finalist in the category of Instruction (1 of 613)
- New Teacher of the Year Award
- Nova Southeastern University Alumni Honors Award
- Teacher Recognition Award-Mathematics Santa Fe Community College
- Colorado Technical University "The Student Comes First" Award
- Colorado Technical University "Special Achievement Award"
- Colorado Technical University "Faculty Service Award"
- Distinguished Faculty Award
- Faculty of the Year Award
- Nova Southeastern University Alumni Honors Award for Outstanding Educational Intervention
- University of Florida Presidential Recognition Award
- Outstanding Student in Mathematics Award
- Outstanding Student in Science Award
- Welfare-to-Work Highest Dedication and Success

TRAININGS

- FACDEV 112: *Coaching Strategies for Learning and Academic Success*
- Diversity and Equality Training
- Georgetown University Canvas Training
- Georgetown University CNDLS Training https://cndls.georgetown.edu/
- Georgetown University Zoom Training
- University of Syracuse Zoom and online active teaching Training
- 2U LMS Training
- University of Syracuse Adobe Training
- University of Syracuse 2-month online teaching training program (synchronous and asynchronous)
- R Programming Coursera Certificate with Distinction
- CTL 026: Adaptive Learning
- CTL025 Measuring Student Performance
- CTL 028 Learning Management Systems and Professional Competency
- ADJ221 Rubric Utilization Workshop
- Training: Motivating by Appreciation

- ADJ220 Fostering Effective Online Student Discussion Areas
- ADJ130 Utilization of Online Learning Resources
- Using Adobe for Education
- ETS 160 Approaches to Teaching and Learning and Designing Online Classes
- CTL 018 LOM Implementation Training
- CTL 019 Utilization of Digital Textbooks Online
- Training: Teaching and Learning Online: Workshop for Designing and Teaching Online Classes
- Training: Creating Multimedia Objects for Online Learning
- Training: Constructivist Learning in Higher Education: Decreasing Students' Cognitive Conflict While Increasing Learner Reflection and Peer Interaction
- ED 102 and RT 101 Student Retention Methods in Online Learning
- PD 101, 102, 103: Teaching Online