David Gillman

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EDUCATION

PhD, Mathematics, MIT — 1993
BA, Mathematics, Yale — 1986

EMPLOYMENT

New College of Florida — 2013 – present
Associate Professor of Computer Science — tenured 2019

Akamai Technologies, Inc. — 2000 – present
Senior Architect, part time in the faculty research group since 2013

Peakstone Corporation — May, 2000 – July, 2000
Principal Scientist

Iterated Systems, Inc. (later MediaBin, acquired by Interwoven, Inc.) — 1996 – 2000
Principal Scientist

University of Toronto — 1994 – 1996
Assistant Professor, Computer Science

Institute for Mathematics & Its Applications, University of Minnesota. — 1993 – 1994
Postdoctoral Research Associate

LEADERSHIP

- Created Computer Science program, New College; curriculum, recruitment, mentorship, 2013-2024
- Co-created Data Science masters program, New College; structure, curriculum, recruitment, 2014-16
- Created and organized Liberal Arts Data Science Workshop, New College, 2018

SERVICE

- New College committees: Provost Advisory (2020-2022), Education Policy (2015-16, 2018-20, 2023-24 co-chair), Natural Science Division Budget (2015-18, 2019-2023), Data Science Curriculum (2015-18), Diversity Task Force (2016-2017), Scholarship (fall 2017), Campus Development (fall 2017), Data Science Admissions (2015-16), Technology (2013-14)
- New College recruitment: Computer science visitor searches (2015, 2018, 2022-2023), Data Science faculty search (2020-21), Computer Science faculty search (2014-15, 2015-16 co-chair, 2019-20 chair, 2023-24 chair), Data Science director search (2017-18 co-chair), adjunct recruitment (2016, 2017, 2022)
- Collaboration on TEAm grant proposal for joint four-college computer science program (2013-14)

PEER-REVIEWED PUBLICATIONS

Student co-authors appear with asterisks.

- with Andrey Skripnikov, Ahmet Cemek*, "Leveraging Minute-by-Minute Soccer Match Event Data to Adjust Team's Offensive Production for Game Context," submitted to the Journal of Quantitative Analysis in Sports, 2024.
- with Uday Goyat* and Atalay Kutlay*, "Teach Yourself Georgian Folk Songs Dataset: A Corpus Of Traditional *A Cappella* Vocal Polyphony," International Symposium on Music Information Retrieval (ISMIR) 2022.
- with D. Randall, "Slow Convergence of Ising and Spin Glass Models with Well-Separated Frustrated Vertices," Analysis of Algorithms 2018 .
- with C. Arias*, E. Craig*, "Predicting readmission from doctors' notes," poster (peer-reviewed) at ML4H, Neural Information Processing Systems Conference, 2017. (https://arxiv.org/abs/1711.10663)
- with B. Maggs, R. Sitaraman, Y. Lin*, "Protecting mission-critical Web sites from attacks," Computer, volume 48, number 4, pages 26-34, April 2015.
- with M Sipitca*, R. Mersereau, "Conditional DCT event coding without side information in video compression," IEEE International Conference on Image Processing, September, 2000.
- with M. Sipitca*, "Conditional entropy coding of DCT coefficients for video compression," Proceedings of the SPIE Symposium on Image and Video Communications and Processing, January, 2000.
- with M. Sipitca*, L. Hurd, "Reconstruction of bilevel images from a low quality JPEG," Proceedings of the SPIE Symposium on Image and Video Communications and Processing, January, 2000.
- "A Chernoff bound for random walks on expander graphs," SIAM Journal of Computing, volume 27, number 4, 1998.
- with M. Mohtashemi and R. L. Rivest, "On breaking a Huffman code," in IEEE Transactions on Information Theory, vol. 42, no. 3, pp. 972-976, May 1996.
- with R. Rivest, "Complete variable-length 'fix-free' codes," Designs, Codes, and Cryptography, volume 5, pages 109-114, 1995.
- with M. Sipser, "Inference and minimization for hidden Markov chains," Proceedings of the ACM Symposium on Computational Learning Theory, July 1994.
- with H. Kaper, M. K. Kwong, "L2-norm inequalities for the differentiation operator on compact intervals," Proceedings of the Royal Society of Edinburgh, volume 110A, pages 335-342, 1988.

OTHER PUBLICATIONS

Student co-authors appear with asterisks.

- with Sam Kellam*, "Teach Yourself Georgian Music on the Web," poster, The XII International Symposium on Traditional Polyphony 2024.
- with Ahmet Cemek*, Andrey Skripnikov, "Statistical Adjustment for 'Prevent Defense' When Evaluating Team's Offensive Output in Soccer," poster, Cascadia Symposium on Statistics in Sports (CASSIS) 2024. This research, under the title, "Studying the Effects of 'Prevent Defense' Tactic on Team's Offensive Output Across Five Major European Club Soccer Leagues," won 2^{nd} place in the Spring 2024 Undergraduate Statistics Competition of the Consortium for the Advancement of Undergraduate Statistics Education and the American Statistical Association.

PRESENTATIONS

- "DDoS Attack Detection Using Tsallis Entropy,"Akamai Internal Research Symposium, Cambridge MA, 2018
- "Akamai Forcefield Log Mining," Akamai Internal Research Symposium, Cambridge MA, 2017
- "Data Science at New College of Florida," MIT Club of Southwest Florida, Sarasota FL, 2017
- "Ants and Bees: Some properties of cellular automata," Mathematics Department, Florida International University, Miami, 2016
- "Data Science at New College of Florida," Sarasota Economic Development Council, 2015

PATENT

- with M. Sipitca, L. Hurd, U.S. patent 6434273, "Method for reconstructing a bi-level image from a low quality discrete transform image," filed June 28, 2000.

UNDERGRADUATE THESES SUPERVISED

- Ahmet Cemek, 2024, "Studying The Effects Of Score Differential On Offensive Output When Evaluating Team Performance In Soccer" (with Prof. Andrey Skripnikov).
- Hunter Chasens, 2024, "The Discovery, Disclosure, and Investigation of cve-2024-25825."
- Zachary East, 2024, "Effects of COVID-19 on the PC and PC Games Market: An Analysis of Time Use."
- Chloe Jones, 2024, "OCR of Greek."
- Sebastian Mark, 2024, "Sleep."
- Damien Razdan, 2024, "Honorguard: A Visual Novel/RPG Experience."
- Devon Gardner, 2023, "Exploring Robot Kinematics: an Engineering Approach."
- Robert Kleszczynski, 2023, "Play it for me. A Study in Melodic Password Usability."
- Vlad Tsimoshchanka, 2023, "Logos Sanctum: Endless Tomes of Knowledge You Create."
- Jacob Adkins, 2022, "Single-Agent and Multi-Agent Bandits."
- Atalay Kutlay, 2022, "Effects Of Multicollinearity in Variable Selection Algorithm" (with Prof. Andrey Skripnikov).
- Austin LoPresto, 2022, "Automated Modernization of Shakespearean English: Using Natural Language Processing to Capture Writing Style."
- Trevor Flint, 2021, "Creating a Hero Recommender System for Newer Players in DOTA 2."
- Amelia Maddox, 2021, "Dance of the Soul: An AI Chhoreographer."
- Peter Chief Nelson, 2021, "Making a First-Person Shooter in Unity."
- Maria Shehata, 2021, "Group Delivery iOS App."
- Serena Bonci, 2020. "Using Sustainable Development to Mitigate and Respond to Climate Change: A Data Analysis of Climate Change in Taiwan using R."
- Rain Kwan, 2020, "Clustering Heart Disease Patients Using Machine Learning."
- Thomas J. Maranzatto, 2020, "Tree Trace Reconstruction: Some Results."
- Dylan Purvis, 2020, "Raspberry Pi Granular Synthesizer."
- Erik Ridd, 2020, "Circus Lyfe: A Narrative Life Simulation Game."
- Andrey Leonov, 2019, "IN RUST WE TRUST: Integrating Rust code into a C codebase on MINIX 3."
- Diana Tarazi, 2019, "NCF Mobile: A Mobile Application to Provide Centralized Information About Services and Resources at New College."
- Sarah Cohen, 2018, "An Introduction to Computational Thinking"
- David Duffrin, 2017, "Estimating the Pronunciation of Japanese Kanji."
- Ben Carothers, 2017, "Building Monitored, Secured, And Self-sustaining IOT Hydroponic Gardens."
- Vinushka Schalk, 2016, "Silicon Chemist 3: Guiding students through electron flow pathways," with a Web application for solving chemical reaction problems.
- David Weinstein, 2015, "Infocatch: A more powerful feed provider built on Webscraping."
- Calvin Troutt, 2015, "Competency Assessment and IRT", with a Web application for the New College Calculus readiness test.

COURSES TAUGHT AT NEW COLLEGE, 2013-2024

- **Undergraduate Core Courses** Introduction to Programming (Python 4x, C 2x, Racket), Object-Oriented Programming (3x), Software Engineering, Databases, Algorithms, Software Development Projects, Data Structures (2x)
- **Undergraduate Topics Courses** Hacking, Distributed Computing, Signal Processing, Image Processing, Natural Language Processing, Computer Vision, Randomized Algorithms, Mobile App Development, Computer Systems and Architecture, Machine Learning, Artificial Intelligence, Reinforcement Learning
- **Graduate Courses** Databases (7x), Practical Data Science, Machine Learning (3x), Natural Language Processing, Deep Learning
- **Selected Tutorials** Automated Chemical Reaction Solver, Game Development (C++, Unity), Python for GIS, Natural Language Processing, Compilers, Java, Clojure, 3D Data Visualization, Information Theory & Coding, Discrete Mathematics, Introduction to Mathematical Proof, Game Theory, Hacking (3x), Software Projects (5x), Quantum Computing, Computational Geometry, Ultimate Frisbee
- **Undergraduate Research** Cellular automata, Internet measurement, automated chemistry education, music information retrieval

STUDENT COMMUNITY SOFTWARE PROJECTS

Principal student participants appear with asterisks.

- Design of website on Brazilian Spiritism for private client, Shawn Nash* and Ariella Russin*, 2022
- "Staying Healthy," mobile app designed and developed for the Florida Literacy Coalition, Erik Ridd*, 2018-2019
- Software redesign, LifeJournal, Dalen Brauner*, 2016.
- NASA Space Apps Challenge, New College, 2016
- Programming projects with geographical data (with Justin Saarinen), 2015-16
- Mobile application for citizen science, Mote Marine Laboratory, Miriam Zeitz*, 2015
- Database and web application, Center for Engagement and Opportunity, New College, David Weinstein*, 2014-15
- Calculus readiness test web application, Mathematics Dept., New College, Calvin Troutt*, 2014-15
- Inventory and scheduling, Planned Parenthood of Southwest and Central Florida, Vinushka Schalk* and Jonathan Niles*, 2014
- Database and web application, MobileBits Holdings Corp., 2014
- Social media startup, Certrek, 2014
- Interdisciplinary projects in computer science and other fields: painting, classics, chemistry education, literature and games, reading education, robotics and animal behavior, hydroponic gardening, language learning, music composition, Chinese history, dance, sports statistics, 2013-24

STUDENT RESEARCH SPONSORED

- Sam Kellam, website for teaching Georgian songs, 2023
- David Castillo, automated chemistry education, 2022
- Uday Goyat (high school student) and Atalay Kutlay, music information retrieval, 2020-22
- Maria Shehata, automated chemistry education, 2019
- Sarah Cohen, Internet measurement, 2018
- Zachary Halladay, Isermann Fellowship project, cellular automata, 2016

OUTREACH

- Hour of Code, Bay Haven School of Basics Plus, Sarasota FL, 2015-19
- SRQHacks hackathon, New College, 2016
- National Day of Civic Hacking, Tampa, 2016; followup project on chronic homelessness with Tampa activist and Tampa Hillsborough Homelessness Initiative

PROFESSIONAL ORGANIZATIONS

- Association for Computing Machinery

ACTIVITIES

Music
Conductor, Nateli community folk choir, 2001 – 2007
Member, The Other Georgia folk trio, 2007 – 2017
Leader, New College Shape-Note and Georgian choir, 2014, 2022
Performer, Inside In C, outdoor musical performance, New College, 2015, 2022

Bird Street Community Center, Dorchester, MA, 2010 – 2013
Board member, reading tutor