GAMZE GÜRSOY

email: gg584@cam.ac.uk
website: www.g2lab.org

POSITIONS HELD

- **Assistant Professor**, Department of Applied Mathematics and Theoretical Physics (DAMTP), April 2026 - present
  University of Cambridge
  - Affiliate, Department of Genetics & Department of Genomic Medicine

- **Herbert Irving Assistant Professor of Biomedical Informatics**, Jul 2024 – Mar 2026
  Columbia University

- **Assistant Professor**, Jan 2022 – Mar 2026
  Department of Biomedical Informatics
  Columbia University
  - Full Member, Program in Mathematical Genomics
  - Affiliate, Computer Science Department & Department of Systems Biology
  - Associate Member, Herbert Irving Comprehensive Cancer Center
  - Associate Member, Data Science Institute

- **Core Faculty Member**, Jan 2022 – Mar 2026
  New York Genome Center

- **Postdoctoral Research Associate**, Nov 2016 – Jan 2022
  Department of Molecular Biophysics & Biochemistry
  Program in Computational Biology and Bioinformatics
  Yale University

- **Fellow,** Benjamin Franklin College, Jan 2018 – Jan 2022
  Yale University

EDUCATION AND TRAINING

- **Postdoctoral Research Associate**, 2016 – 2022
  Computational Biology and Bioinformatics
  Yale University, **Advisor:** Mark Gerstein

- **Ph.D.**, Dec 2016
  Bioinformatics (Under Biomedical Engineering and Computer Science)
  University of Illinois at Chicago (UIC), **Advisor:** Jie Liang
  Thesis: Three-dimensional Chromosome Organization in Eukaryotes: Novel Computational Approaches

- **B.S.,** Jan 2008
  Chemical Engineering
  Bogazici University, Istanbul – Turkey, **Advisors:** Mehmet Camurdan and Turkan Haliloglu

HONORS AND AWARDS

- **2025**, Best poster award, IEEE Symposium on Security and Privacy

- **2024-2027**, **Irving Scholar**, Columbia University Irving Medical Center [named Professorship and 3 years discretionary funding]

- **2022-2027**, **R35 NIH/NIGMS Maximizing Investigators' Research Award**

- **2021, Intersections Science Fellow**, https://www.intersectionssciencefellows.com

- **2020-2025, K99/R00 NIH/NHGRI Pathway to Independence Award**
  - **Press:** https://bioe.uic.edu/news-stories/searching-for-new-ways-to-keep-dna-data-secure/

- **2019,** Third place, iDASH Secure Genome Analysis Competition Track 1 (http://www.humangenomeprivacy.org/2019/)

- **2018,** First place, iDASH Secure Genome Analysis Competition Track 1 (http://www.humangenomeprivacy.org/2018/)

- **2018,** NIH/BD2K IBM Young Investigator Award (awarded to 5 young researchers); First prize for the best presentation among young investigators

- **2016**, **UIC Outstanding dissertation award** (given to one Ph.D. among all STEM dissertations)

- **2014, UIC Chancellor's Graduate Fellowship**

- **2010**, Mathematical Sciences Research Institute Summer School scholarship for "Algebraic, Geometric, and Combinatorial Methods for Optimization", Berkeley, CA

- **2007**, Honorarium for research internship at the **NASA Center for Advanced Microgravity Materials Processing**, Boston, MA

- **2002-2007**, Turkish Education Foundation Scholarship (tuition and stipend for 5 years)

FUNDING
(Major awards as the Principal Investigator)

Active:

- **Warren Alpert Foundation:** Advancing precision psychiatry through integration of genetic and clinical data**, Total over 3 years=** $2,200,000
- **UKRI Global Talent Fund:** Research in evolutionary and computational biology**, Total over 5 years=** £1,300,000
- **UKRI Advanced Research + Invention Agency (ARIA):** LOCKSEQ — Physical-Layer Encryption for Sequencing, **Total over 2 years=** £500,00

Ended or transferred:

- **NIH,** Federated learning algorithms to overcome statistical and algorithmic bias and privacy concerns in machine learning for health**, Total over 4 years=** $1,432,448

- **NIH,** Tools to address the challenges of preserving privacy in sharing and analysis of biomedical data, **Total over 5 years =** $2,213,032

- **NIH,** Privacy Preservation in Transcriptomic Data Analysis, **Total over 1 year =** $855,711

- **NIH,** Realistic quantification of potential privacy loss from genomic summary results**, Total over 3 years =** $747,000

- **MacMillan Family Foundation,** Genetic determinants of chromatin organization in solid tumors**, Total over 3 years =** $750,000

- **NIH,** Delineating the functional impact of recurrent repeat expansions in ALS using integrative multiomic analysis**, Total over 1 year =** $323,817

PUBLICATIONS
(Students/postdocs who I directly mentored are underlined, * denotes co-first authorship, # denotes co-last authorship)

Last author Peer Reviewed Papers from Gürsoy Lab

- Kirill Nikitin, Afsana Ferdous, **Gamze Gürsoy#** and Lucy Simko #, "On practical privacy challenges of medical research in the US". ***To appear at the Proceedings of Privacy-Enhancing Technologies Symposium (PoPeTs'26)***

- Florent Pollet, Kirill Nikitin, Tong Wang, Rahul Gupta, Noemie Elhadad#, and **Gamze Gürsoy#**, "Privacy audits for clinical large language models", *Proceedings of the 11th Machine Learning for Healthcare Conference*, ***PMLR,*** 2026

- Bianca Brown*, Xiaoting Li*, Monica R. Grasty, Isabel R. Lopez, Sara Dzigurski, Maya N. Geradi, Michael R. Weed, John D. Elsworth, Matthew Lawrence, **Gamze Gürsoy#** and Andrew Miranker #, "African Green Monkeys Respond to Synthetic AB oligomers with persistent alzhemier's-like activation", ***Communications Biology, accepted,*** *2026*

- Kirill Nikitin, **Gamze Gürsoy,** "Private information leakage from polygenic risk scores", ***Genome Research, accepted,*** *2026 [RECOMB'26 special issue]*
  Github: https://github.com/g2lab/prsprivacy
  - A news article about this publication was featured in *New Scientist*: Swain, F. 'Sharing genetic risk scores can unwittingly reveal secrets': https://www.newscientist.com/article/2518761-sharing-genetic-risk-scores-can-unwittingly-reveal-secrets/, 2025

- Jacob Blindenbach, Shaunak Soni, **Gamze Gürsoy,** "Privacy preserving pangenome graphs", ***Nature Communications,*** **17, 1805,** *2026 [also accepted at RECOMB'26]*
  Github: https://github.com/g2lab/panmixer

- Ahmed Elhussein, Florent Pollet, **Gamze Gürsoy,** "PlayerFL: A principled approach to personalized layer-wise cross-silo federated learning", ***Proceedings of Machine Learning and System'26 Conference,*** *2026*

- Abigail Newbury, Xinzhuo Jiang, Karthik Natarajan#, **Gamze Gürsoy#,** "Cross biobank comparison of phenomic profiles", ***Proceedings of AMIA'25 Symposium,*** *2025*

- Ahmed Elhussein, **Gamze Gürsoy,** "A Universal Metric of Dataset Similarity for Cross-silo Federated Learning", **Proceedings of *2025 IEEE International Conference on DataMining*** *(**IEEE ICDM**), 2025*
  Github: https://github.com/g2lab/ot-cost

- Abigail Newbury, Ahmed Elhussein, **Gamze Gürsoy,** "Multi-domain phenotyping rules result in improved GWAS outcomes", 8(1): 499, ***npj Digital Medicine,*** 2025

- Ahmed Elhussein, Paul Meddeb, Abigail Newbury, Jeanne Mirone, Martin Stoll, **Gamze Gürsoy,** "KEEP: Integreating medical ontologies with clinical data for robust code embeddings", 287:43-62, *Proceedings of the 6th conference on Health, Inference, and Learning,* ***PMLR****,* 2025

- J. Carlos Angel, Narjis El Amraoui, **Gamze Gürsoy,** "pC-SAC: Method for High-Resolution 3D Genome Reconstruction from Low-Resolution Hi-C Data", 53 (7), ***Nucleic Acids Research,*** 2025
  Github: https://github.com/g2lab/pcsac

- Seungwan Hong, Conor R. Walker, Yoolim A. Choi, **Gamze Gürsoy,** "Secure and scalable gene expression quantification with pQuant", 16, 2380, ***Nature Communications,*** 2025
  Github: https://github.com/g2lab/pQuant

- Rashid Al-Abri, **Gamze Gürsoy,** "ScatTR: Estimating the Size of Long Tandem Repeat Expansions from Short-Reads", in the proceedings of ***29th Annual International Conference on Research in Computational Molecular Biology (RECOMB'25),*** 2025
  RECOMB special issue in ***Genome Research***
  Github: https://github.com/g2lab/scattr

- Yoolim A. Choi, Yebin Kim, Peihan Miao, Tuuli Lappalainen, **Gamze Gürsoy,** "Secure and Federated Quantitative Trait Loci Mapping with privateQTL", 5(2): 100769, ***Cell Genomics,*** 2025
  Github: https://github.com/g2lab/privateQTL
  - A preview of this article was published in the same issue: Zhang, W., Wu, X. & Gong, J. Overcoming collaboration barriers in quantitative trait loci analysis. Cell Genom 5, 100773 (2025).

- Jacob Blindenbach, Jiayi Kang, Seungwan Hong, Caline Karam, Thomas Lehner, **Gamze Gürsoy,** "Ultra-secure storage and analysis of genetic data for the advancement of precision medicine", 25, 314, ***Genome Biology***, 2024
  Github: https://github.com/g2lab/squid

- Conor Walker, Xiaoting Li, Manav Chakravarthy, William Lounsbery-Scaife, Yoolim A. Choi, Ritambhara Singh, **Gamze Gürsoy,** "Private information leakage in single cell count matrices", *187*(23), 6537-6549, ***Cell***, 2024
  Github: https://github.com/g2lab/scprivacy
  - A preview of this article was published in *Patterns*: Cho, H. Privacy of single-cell gene expression data. *Patterns (N Y)* **5**, 101096 (2024).
  - A news article about this publication was featured in *Nature*: Kudiabor, H. 'Anonymous' genetic databases vulnerable to privacy leaks. *Nature Publishing Group UK* http://dx.doi.org/10.1038/d41586-024-03236-1 (2024)

- Ahmed Elhussein, Ulugbek Baymuradov, NYGC ALS Consortium, Noemie Elhadad, Karthik Natarajan, **Gamze Gürsoy,** "A framework for sharing of clinical and genetic data for precision medicine applications", 30(12):3578-3589, ***Nature Medicine***, 2024
  Github: https://github.com/g2lab/precisionchain
  - A patent from this work has been obtained: G Gürsoy, A Elhussein - US Patent 18/419,923, 2024

- Seungwan Hong*, Yoolim A. Choi*, Daniel S. Joo, **Gamze Gürsoy,** "Privacy-preserving model evaluation for logistic and linear regression using homomorphically encrypted genotype data, 156:104678, ***Journal of Biomedical Informatics***, 2024
  Github: https://github.com/g2lab/privateML

- Ahmed Elhussein, Murad Megjhani, Daniel Nametz, Miriam Weiss, Jude Savarraj, Soon Bin Kwon, David J. Roh, Saachin Agarwal, Sander Connolly, Angela Velazquez, Jan Claassen, Huimahn Choi, Gerrit Schubert, Soojin Park#, **Gamze Gürsoy#.** "A generalizable physiological model for detection of delayed cerebral ischemia using federated learning", Proceedings of *2023*

*IEEE International Conference on Bioinformatics and Biomedicine (**IEEE BIBM**)*
doi: https://doi.org/10.1109/BIBM58861.2023.10385383
Github: https://github.com/G2Lab/DCI_FL

- Ahmed Elhussein and **Gamze Gürsoy**, "Privacy-preserving patient clustering for personalized federated learning", 219:150-166, *Proceedings of the 8th Machine Learning for Healthcare Conference*, ***PMLR,*** 2023
Github: https://github.com/G2Lab/pcfbl

- Rockwell J Weiner, Chriag Lakhani, David Knowles, **Gamze Gürsoy.** "LDmat: Efficiently queryable compression of linkage disequilibrium matrices" , 39(2):btad092, ***Bioinformatics***, 2023
Github: https://github.com/g2lab/ldmat

- **Gamze Gürsoy, "**Genome Privacy and Trust", (5) 163-181, ***Annual Review of Biomedical Data Science***, 2022 (invited review)

Contributed Papers & Preprints from Gürsoy Lab:

- Xinhe Xue, Zoran Z. Gajic, Christina M. Caragine, Mateusz Legut, Conor R. Walker, James Y.S. Kim, Xiao Wang, Rachel E. Yan, Hans-Hermann Wessels, Congyi Lu, Neil Bapodra, Gamze Gürsoy, Neville Sanjana, **"**Paired CRISPR screens to map gene regulation in cis and trans**",** **accepted, *Nature Genetics*,** 2026
doi: https://doi.org/10.1101/2024.11.27.625752

- David Iyangson, Sahbaaz Ansari, Tushar M. Jois, Rosario Gennaro, **Gamze Gürsoy**, Gabriel Kaptchuk, Moti Yung, Diogo Barradas, "TriftyMPC: Reducing the cost of large-scale MPC in the cloud", Cryptology e-print archive, 2026/977

- Mohammadjavad Zohrabi, **Gamze Gürsoy**, Russel Bowler, Katerina Kechris, Farnoush Banaei-Kashani, "AE-AEPD: Repurposing adversarial evasion for cross-omics linkage defense, to appear in the proceedings of ACM Bioinformatics and Computational Biology, 2026

- Robin Linzmayer, Chao Pang, Iñigo Urteaga, **Gamze Gürsoy**, Amanda A. Shea, Virginia J Vitzthum, Noémie Elhadad, "A foundation model for capturing complexity of menstrual health data", ***npj Women's Health***, 2026

- Jack Humphrey, Ali Oku, Marta Byrska-Bishop, Anna O Basile, Uday S Evani, André Corvelo, Alex Tokolyi, Kailash Bp, Aline Réal, Yebin Kim, Marielle L Bond, Wayne E Clarke, Rui Fu, Heather Geiger, Sei Chang, Tatsuhiko Naito, Beomjin Jang, Rajeeva Musunuri, Winston H Dredge, Rashid Al-Abri, Benjamin N Hoover, Dina Manaa, Jaime McClintock, Faith P Singh, Maria H Pedersen, Alexi Runnels, Nadia Propp, Samantha Fennessey, Hong-Hee Won, Michael C Zody, Giuseppe Narzisi, Nicolas Robine, Tuuli Lappalainen, Delphine Fagegaltier, **Gamze Gürsoy**, David A Knowles, Towfique Raj, Matthew B Harms, Hemali Phatnani, NYGC ALS Consortium, "The New York Genome Center ALS Consortium resource integrates postmortem tissue transcriptomics and whole genome sequencing to empower biological discovery", ***medRxiv***, 2026

- Eric Ni, Xiangru Tang, Xiao Zhou, Danielle Lee, Ahmed Elhussein, Elizabeth Knight, **Gamze Gürsoy**, Mark Gerstein, "Recent advances and future prospects for blockchain in biomedicine" 101114, ***Cell Reports Methods***, 2025

- Fangyi Chen, Kenrick Cato, **Gamze Gürsoy**, Patricia C Dykes, Graham Lowenthal, Sarah Rossetti, "Toward Identifying New Risk Aversions and Subsequent Limitations and Biases When Making De-identified Structured Data Sets Openly Available in a Post-LLM world", 262, ***AMIA Annual Symposium Proceedings***, 2025

- Jacob Blindenbach, Jung Hee Cheon**, Gamze Gürsoy,** Jiayi Kang**,** "On the overflow of p-adic theory applied to homomorphic encryption"**, at *The International Symposium on Cyber Security, Cryptology, and Machine Learning (CCML),*** 2024 [Authers listed alphabetically]

- Fangyi Chen, Syed Mohtashim Abbas Bokhari, Kendrick Cato, **Gamze Gürsoy**, Sarah Collins Rosetti. "Examining the Generalizability of Pretrained De-identification Transformer Models on Narrative Nursing Notes", ***Applied Clinical Informatics***, 1:1-198, 2024

Significant Publications Prior to Gürsoy Lab

- Suchen Zheng*, Nitya Takkar*, Hannah L Harris, Megan Zhang, Susanna Liu, Mark Gerstein, Erez Lieberman Aiden, Jordan Rowley, William S Noble, **Gamze Gürsoy#,** Ritambhara Singh#. "Predicting A/B compartments from histone modifications using deep learning", ***iScience,*** 27 109570
Github: https://github.com/rsinghlab/CoRNN

- Joel Rozowsky*, Jiahao Gao*, Beatrice Borsari*, Yucheng Yang*, Timur Galeev*, **Gamze Gürsoy*,** Charles Epstein*, Kun Xiong*, Jinrui Xu*, …, Michael Schatz#, Roderic Guigo,# Bradley Bernstein#, Thomas Gingeras#, and Mark Gerstein#. The EN-TEx resource of multi-tissue personal epigenomes & variant impact models", ***Cell***, 186(7):1493-1511.e40, 2023

- Graham Ervin*, **Gamze Gürsoy*,** Rashid Al-Abri, Ashwini Suriyaprakash, Egor Dolzhenko, Kevin Zhu, Christian R. Hoerner, Shannon M. White, Lucia Ramirez, Ananya Vadlakonda, Alekhya Vadlakonda, Konor von Kraut, Julia Park, Charlotte M. Brannon, Daniel A. Sumano, Raushun A. Kirtikar, Alicia A. Erwin, Thomas J. Metzner, Ryan K. C.Yuen, Alice C. Fan, John T. Leppert, Michael A. Eberle, Mark Gerstein, Michael P. Snyder, "A genome-wide atlas of recurrent repeat expansions in human cancer", ***Nature***, 613:96-102, 2023
Github: https://github.com/rashidalabri/cancer-rre-paper-analysis

- Amol Khanna, Vincent Schaffer, **Gamze Gürsoy#,** Mark Gerstein#. "Privacy-preserving model training using federated learning with differential privacy", ***Conf Proc IEEE Eng Med Biol Soc.,*** 1358-1361, 2022
Github: https://github.com/gersteinlab/idash20fl

- **Gamze Gürsoy*,** Charlotte Brannon*, Sarah Wagner, and Mark Gerstein. "Storing and analyzing a genome on a blockchain", ***Genome Biology***, 23, 134, 2022
Github: https://github.com/gersteinlab/SAMChain

- **Gamze Gürsoy*,** Eduardo Chielle*, Charlotte Brannon, Mihalis Maniatakos, and Mark Gerstein. "Privacy-preserving genotype imputation using homomorphic encryption", ***Cell Systems***, 13(2): 173-181, 2022
Github: https://github.com/gersteinlab/idash19he

- **Gamze Gürsoy,** Tianxiao Li, Susanna Liu, Eric Ni, Charlotte Brannon, and Mark Gerstein. "Functional genomics data: Privacy risk assessment and technological mitigation", ***Nature Reviews Genetics***, 23: 245-258, 2021

- **Gamze Gürsoy,** Nancy Lu, Sarah Wagner, and Mark Gerstein. "Recovering genomes and phenotypes using allele-specific gene expression." ***Genome Biology***, 22, 263, 2021
Github: https://github.com/gersteinlab/privaseq4

- **Gamze Gürsoy,** Prashant Emani, Charlotte Brannon, Otto A. Jolanki, Arif Harmanci, J. Seth Strattan, J. Michael Cherry, Andrew Miranker, and Mark Gerstein. "Data sanitization to prevent private information leakage in functional genomics", ***Cell***, 183(4): 905-917, 2020

Website: https://privaseq3.gersteinlab.org
Github: https://github.com/ENCODE-DCC/ptools

- ASHG Press Release in 2018: New file type improves genomic data sharing while maintaining participant privacy.
- Yale Press Release: Yale team finds way to protect genetic privacy in research.
- Science Daily News: Researchers simulate privacy leaks in functional genomics studies.
- Q & A with The Scientist: A new tool for ensuring genetic privacy.

- **Gamze Gürsoy**, Charlotte Brannon, Fabio C.P. Navarro, and Mark Gerstein. "FANCY: Fast estimation of privacy risk in functional genomics data", ***Bioinformatics,*** btaa661, 2020
  Website: https://fancy.gersteinlab.org
  Github: https://github.com/gersteinlab/FANCY

- **Gamze Gürsoy*,** Charlotte Brannon*, Mark Gerstein. "Using Ethereum blockchain to store and query pharmacogenomics data via smart contracts", ***BMC Medical Genomics,*** 13:74, 2020
  Github: https://github.com/gersteinlab/idash19bc

- **Gamze Gürsoy,** Rob Bjornson, Molly E. Green, and Mark Gerstein. "Using blockchain to log genome dataset access: efficient storage and query", ***BMC Medical Genomics,*** 13(Suppl 7):78, 2020
  Github: https://github.com/gersteinlab/iDASH-blockchain

- **Gamze Gürsoy,** Yun Xu, and Jie Liang. "Spatial organization of budding yeast genome in cell nucleus and identification of specific chromatin interactions from multi-chromosome constrained chromatin model", ***PLoS Comput Biol.,*** 13(7):e1005658, 2017
  Github: https://github.com/uic-lianglab/mCSAC

- **Gamze Gürsoy*,** Yun Xu*, Amy Kenter, and Jie Liang. "Computational construction of 3D chromatin ensembles and prediction of functional interactions of α-globin locus from 5C data", ***Nucleic Acids Research,*** 45(20):11547-11558, 2017
  Github: https://github.com/uic-lianglab/nCSAC

- **Gamze Gürsoy,** Anna Terebus, Youfang Cao, and Jie Liang. "Mechanisms of Stochastic Focusing and Defocusing in Biological Reaction Networks: Insight from Accurate Chemical Master Equation (ACME) Solutions", ***Conf Proc IEEE Eng Med Biol Soc.***1480-1483, 2016

- **Gamze Gürsoy,** Yun Xu, and Jie Liang. "Computational predictions of structures of budding yeast genome", ***Conf Proc IEEE Eng Med Biol Soc.,*** 3945-8, 2014

- **Gamze Gürsoy*,** Yun Xu*, Amy Kenter and Jie Liang. "Spatial confinement is a major determinant of folding landscape of human genome", ***Nucleic Acids Research,*** 42(13):8223-8230, 2014
  Github: https://github.org/uic-lianglab/CSAC

Contributed Papers Prior to Gürsoy Lab:

- Esha Sarkar, Eduardo Chielle, **Gamze Gürsoy**, Oleg Mazonka, Mark Gerstein, and Michail Maniatakos. "Fast and Scalable Private Genotype Imputation Using Machine Learning and Partially Homomorphic Encryption", ***IEEE Access***, vol.9, pp. 93097-93110, 2021

- Prashant Emani, Maya N. Gradi, **Gamze Gürsoy**, Monica R. Grasty, Andrew Miranker, and Mark Gerstein. "Assessing and mitigating privacy risks of sparse, noisy genotypes by local alignment to haplotype databases", ***Genome Resarch,*** 33:2156-2173, 2023

- Jing Zhang, Jason Liu, Donghoon Lee, Shaoke Lou, Zianlin Chen**, Gamze Gürsoy**, and Mark Gerstein. “DiNeR: a differential graphical model for analysis of co-regulation network rewiring”, ***BMC Bioinformatics***, 21:281, 2020

- Jing Zhang, Donghoon Lee**,** … , **Gamze Gürsoy**, … , Mark Gerstein. “An integrative ENCODE resource for cancer genomics”, ***Nature Communications***, 11:3696, 2020

- Jie Liang, Youfang Cao, **Gamze Gürsoy**, Hammad Naveed, Anna Terebus, and Jieling Zhao. “Multiscale modeling of cellular epigenetic states and tissue patterning: stochasticity in molecular networks, chromatin folding in cell nucleus, and cell-cell interactions in tissue patterning”, ***Crit Rev Biomed Eng***., 43(4):323-46, 2015

- Sara M. Camp, Ermelinda Ceco, Carrie L. Evenoski, Sergei M. Danilov, Tong Zhou, Eddie T. Chiang, Liliana Moreno-Vinasco, Brandon Mapes, Jieling Zhao, **Gamze Gürsoy**, Mary E. Brown, Djanybek M. Adyshev, Shahid S. Siddiqui, Hector Quijada, Saad Sammani, Eleftheria Letsiou, Laleh Saadat, Mohammed Yousef, Ting Wang, Jie Liang, and Joe G. N. Garcia. **“**Unique Toll-Like Receptor 4 Activation by NAMPT/PBEF Induces NFκB Signaling and Inflammatory Lung Injury”, ***Scientific Reports****,* 14(5):13135, 2015

- Reka Albert, Bhaskar DasGupta, Rashmi Hedge, Gowri Sangeetha Sivanathan, Anthony Gitter, **Gamze Gürsoy,** Pradyut Paul, Eduardo Sontag. “Computationally efficient measure of topological redundancy of biological and social networks”, ***Physical Review E****,* 84:036117, 2011

- Georgi Z. Genchev, Morten Kallberg, **Gamze Gürsoy**, Anuradha Mittal, Lalit Dubey, Ognjen Perisic, Gang Feng, and Hui Lu. “Mechanical signaling on the single protein level studies using steered molecular dynamics”, ***Cell Biochemistry and Biophysics***, 55:141-152, 2009

- Mariam N. Ismail, Naftali D. Fraiman, Dennis M. Callahan Jr., **Gamze Gürsoy**, Edward Viveiros, Onnaz Ozkanat, Zhaoxia Ji, Ronald J. Willey, Juliusz Warzywoda and Albert Sacco Jr. “First unseeded hydrothermal synthesis of microporous vanadosilicate AM-6”, ***Microporous and Mesoporous Materials***, 120:454-459, 2009

Book Chapters:

- **Gamze Gürsoy.** “Criticality of data sharing in genomic research and public views of genomic”, in Responsible Genomic Data Sharing: Challenges and Approaches, ***Elsevier***, 2020

Opinion & Commentary:

- **Gamze Gürsoy** and Mark Gerstein. “As coronavirus testing expands, new personal privacy issues arise” in Hartford Courant.

- **Gamze Gürsoy**, Megan Doerr, John Wilbanks, Jennifer K Wagner, Haixu Tang, Steven E Brenner. “Navigating ethical quandaries with the privacy dilemma of biomedical datatets”, ***Proceedings of Pacific Symposium on Biocomputing***, 2020

- **Gamze Gürsoy**, Arif Harmanci, Haixu Tang, Erman Ayday, Steven E Brenner. “When Biology gets personal: Hidden Challenges of Privacy and Ethics in Biological Big Data”, ***Proceedings of Pacific Symposium on Biocomputing***, 2019
- **Gamze Gürsoy** and Jie Liang. “3D Chromosome Structures from Energy Landscape“, ***PNAS***, 2016, 113, (43), 11991-11993

TEACHING AND MENTORING

PhDs/PhD Candidates:

- **Ahmed Elhussein, MD, PhD:** Biomedical Informatics'25 (Columbia University), Current Position: Quantitative Researcher at CITADEL
- **Yoolim Annie Choi, PhD:** Biomedical Informatics'25, (Columbia University), Current Position: Safety Research Engineer at ZOOX
- **Jacob Blindenbach:** Computer Science (Columbia University)
- **Abigail Newburry:** Biomedical Informatics (Columbia University)
- **Juan Carlos Angel Castellan:** Pharmacology (Columbia University)
- **Rashid Al-Abri:** Computer Science (Columbia University)
- **Sobhan Shukueian Tabrizi:** DAMTP (University of Cambridge)

Postdoctoral Scientist:

- **Conor R. Walker, PhD:** Feb 2022 – Aug 2024, Current Position: Scientist at MODERNA
- **Gediminas Drabavicius, PhD:** Aug 2022 – Sep 2024, Current Position: Group Leader at Vilnius University
- **Anoushka Joglekar, PhD:** Jan 2023 – Sep 2024, Current Position: Senior Computational Biologist at ImmunAI
- **Seungwan Hong, PhD:** Mar 2022 – Dec 2025: Current Position: Postdoctoral Research Associate at Yale University
- **Kirill Nikitin, PhD** (at Columbia University)
- **Sydney Conner, PhD** (at University of Cambridge)
- **Xiaoting Li, PhD** (at University of Cambridge)
- **Alison Sutherland, PhD** (at University of Cambridge)
- **Bianca Brown, PhD** (at University of Cambridge)
- **Veysel Ogulcan Kaya, PhD** (at University of Cambridge)
- **Xin Huan, PhD** (at University of Cambridge)

Courses:

- **Michaelmas 2026:** Lecturer, DAMTP, University of Cambridge
  - Genomics I**:** Fundamentals
  - Designed a new course for the Computational Biology MPhil Program

- **Lent 2026:** Lecturer, DAMTP, University of Cambridge
  - Genomics II**:** Emerging Data Science Techniques in Biology and Medicine
  - Designed a new course for the Computational Biology and Data Intensive Sciences MPhil Programs

- **Fall 2022/2023/2024/2025:** Instructor, Columbia University
  - BINF G4001 & COMS W4560**:** Introduction to Computational Biomedicine and Health
  - Cross-listed with Columbia Engineering (Computer Science)
    Website: www.g2lab.org/binf4001

- **Spring 2023/2024:** Guest Lecturer, Columbia University
  - Mathematical Genomics

- **Spring 2022:** Guest Lecturer, Columbia University
  - Psychiatric Genomics Lecture Series

- **Fall 2019:** Guest Lecturer, Yale University
  - MB&B 594. Integrated workshop.

- **Spring 2013:** Guest Lecturer, UIC

- BIOE 101. Introduction to Bioengineering.

- **Spring 2012:** Guest Lecturer, UIC
  - CS502. Algorithms in Computational Biology.

- **Fall 2008 – Summer 2009:** Teaching Assistant, UIC
  - BIOE 240. Modeling Physiological Data and Systems.
  - BIOE 594. Biodatamining and Machine Learning
  - BIOE 483. Molecular Modeling

INSTITUTIONAL SERVICE & LEADERSHIP

- **University of Cambridge, DAMTP — Convenor, Mathematical and Computational Biology Theme** (2026–Present)
  - Coordinate the department's activities and strategic development in mathematical and computational biology.
  - Support collaboration, community-building, and academic planning across faculty working at the interface of mathematics, computation, and biology.
- **University of Cambridge, MPhil in Computational Biology Programme** (2026–Present)
  - Contribute to the academic and administrative management of the programme.
  - Design and develop two new courses in computational genomics, machine learning, and privacy-preserving biomedical data analysis.
  - Support curriculum planning, assessment design, programme delivery, and other administrative activities.
- **University of Cambridge, DAMTP High-Performance Computing Working Group** (2026–Present)
  - Assess the department's current and future computational requirements.
  - Advise on high-performance computing infrastructure, equipment purchasing, storage, and related research-computing needs.
  - Provide strategic advice to the Head of Department on computational infrastructure and investment priorities.

- **University of Cambridge, Faculty of Mathematics Equality, Diversity and Inclusion Initiative** (2026–Present)
  - Support the Faculty's welcome event for women and non-binary students.
  - Contribute to the development and delivery of the women and non-binary student mentorship programme.

- **University of Cambridge, DAMTP Faculty Search Committee — Assistant Professor in Computational Biology** (2026)
  - Served on the faculty search and hiring committee for an Assistant Professor position in computational biology.
  - Contributed to candidate evaluation, interviews, and appointment recommendations.

- **Columbia University, Biomedical Informatics Training Committee (2023 - 2026)**
  - Oversee PhD and Master's programs, including admissions, interviews, curriculum development, and milestone evaluations.
  - Manage activities related to NLM T15 training grants.
  - Organize departmental retreats, certificate programs, and training initiatives.
  - Participate in weekly committee meetings.

- **Columbia University, AI Initiative Research Working Group (2024 - 2026)**
  - Lead development of a medical school-wide survey on AI tools and datasets.
  - Organize a federated learning workshop.
  - Organize and moderate the AI and Cancer panel at the Columbia AI Summit.
  - Attend biweekly meetings.

- **Columbia University, Irving Institute for Clinical and Translational Research (2024 - 2026)**
    - Lead AI-focused initiatives in medicine, including infrastructure development and grant renewals.

- **Columbia University, Herbert Irving Comprehensive Cancer Center (2022 - Present)**
    - Member of the Cancer Genomics and Epigenomics Working Group.

- **Columbia University, Data Science Institute (2022 - Present)**
    - Member of the Privacy & Security and Health Analytics Working Groups.

INVITED TALKS

- **International Genome Graph Symposium**, keynote speaker, 05-09/07/2026
- **Summer Research Conference of the Department of Genomics Medicine,** 06/26/2026, Cambridge, UK
- **University of Cambridge's Computational Biology Annual Symposium**, 05/13/2026, Cambridge, UK
- **International Society for Computational Biology UK Conference**, 04/15/2026, Cambridge, UK
- Dagstuhl seminar "**Computational Privacy for Rapidly Sharing Biomedical Data on a Global Scale",** invited attendee and speaker, 02/15/2026, Dagstuhl, Germany
- **AI in Radiation Oncology Course**, invited instructor, 01/15/2026, Geneva, Switzerland
- **Weill Cornell Physiology, Biophysics and Systems Biology (PBSB) Seminar Series**, 12/10/2025, New York, NY
- **Columbia University AI @ VP&S Initiative Foundation Models Workshop,** 11/11/2025, New York, NY
- **AAAI Fall Symposium Series**, Safe, Ethical, Certified, Uncertainty-aware, Robust, and Explainable AI, 06/11/2025, Washington DC
- **New York Institute of Technology**, Center for Biomedical Data Science, 31/10/2025, New York, NY
- **Broad Institute**, Model, Inference, Algorithms Seminar Series, 09/10/2025, Boston, MA
- **Yale University**, Department of Molecular Biophysics and Biochemistry, 09/15/2025, New Haven, CT
- **Computational Genomics Summer Institute at UCLA**, 07/14/2025, Los Angeles, LA
- **Columbia University Center for Precision Medicine Scholars' Day**, 06/18/2025, New York, NY
- **Multi Omics NETwork Analysis Workshop (MONET) Keynote Speaker,** 06/08/2025, Colorado University Anschutz Medical Campus, CO
- **2nd International Caparica Conference on Prescriptomics and Precision Medicine**, 05/26/2025, Caparica, Portugal
- **Federated Learning for Health Workshop: Why, What, How**?, AI @ VP\&S Initiatives at Columbia Medical School, 05/16/2025, New York, NY
- **Spring 2025 NYC Privacy Day (invited speaker),** 04/18/2025, New York, NY
- **Columbia University Genomics Seminar Series**, 04/10/2025, New York, NY
- **University of California Los Angeles,** Department of Computational Medicine, 04/09/2025, Los Angeles, CA
- **Massachusetts General Hospital,** Center for Precision Psychiatry seminar series, 03/14/2025, Boston, MA
- **CSHL Probabilistic Modeling in Genomics** Conference (invited Discussion Leader), 03/06/2025, Long Island, NY
- **University of Chicago**, Program in Computational Biology, 02/14/2025, Chicago, IL
- **Columbia University Data Science for Public Health Summit**, 01/31/2025, New York, NY
- **CSHL Biological Data Science Conference**, 11/13/2024, Long Island, NY
- **Department of Computational Medicine and Biology at University of Michigan**, 10/30/2024, Ann Arbor, MI
- **GSTEM Symposium at NYU** (keynote speaker), 08/09/2024, New York, NY

- **Computational Genomics Summer Institute at UCLA**, 07/29/2024, Los Angeles, LA
- **Meet the jury lecture at KU Leuven**, 07/05/2024, Leuven, Belgium
- **MD Anderson Data Science Forum**, 04/22/2024, virtual
- **10th International Workshop on Genome Privacy and Security**, 11/17/2023, virtual
- **World Congress in Psychiatric Genomics** (plenary speaker), 10/12/2023, Montreal, CA
- **Festival of Genomics**, 10/05/2023, Boston, MA
- **Rockefeller University**, 09/20/2023, New York, NY
- **International Conference on Complex Acute Illness**, 09/08/2023, Ausburg, Germany
- **New York University Biology Departmental Seminar,** 05/09/2023, New York, NY
- **NIH Biomedical Information Science and Technology Seminar Series,** 03/02/2023, virtual
- **Columbia University Engineering in Medicine Symposium,** 02/23/2023, New York, NY
- **Sanavia Oncology Seminar Series,** 02/09/2023, New York, NY
- **Haverford University Early Career Seminar Series,** 02/07/2023, Haverford, PA
- **NHGRI eMERGE Steering Committee Meeting (virtual),** 02/01/2023, Los Angeles, LA
- **NIDA Single Cell Opioid Responses in the Context of HIV, Analysis Working Group (virtual),** 01/05/2023, Bethesda, MD
- **Colorado University Anschutz Medical Center, Computational Bioscience Program,** 12/12/2022, Aurora, CO
- **University of Pittsburgh, Department of Biomedical Informatics (virtual),** 12/02/2022, Pittsburgh, PA
- **Columbia University and NIH,** Omics Approaches to Investigate Neurobiology of Suicide meeting, 11/17-18/2022, New York, NY
- **Brown University, Data Science Institute,** 10/05/2022, Providence, RI
- **Saint Luis University Bioinformatics and Computational Biology Program (grad orientation keynote),** 8/22/2022, St. Louis, MO
- **NIMH Genomics Team Seminar Series (virtual),** 8/16/2022, Bethesda, MD
- **ISMB'22 Genome Privacy Workshop,** 7/12/2022, Madison, WI
- **NYU Institute for Systems Genetics Nano Seminar,** 5/19/2022, New York, NY
- **Bioinfocongress (virtual),** 3/20/2022**,** Istanbul – Turkey
- **Columbia University, Herbert Irving Cancer Center,** 3/16/2022, New York, NY
- **University of British Columbia Cancer Center (virtual),** 3/7/2022, Vancouver, BC
- **Weill Cornell, Institute for Computational Biology,** 2/14/2022, New York, NY
- **Institute for Mathematical and Statistical Innovation workshop: Private AI: Machine Learning on Encrypted Data,** 2/9/2021, Chicago, IL
- **Columbia University, Data Science Health Initiative Workshop,** 12/10/2021, New York, NY
- **AI for Genomics Workshop at New York Genome Center,** 12/3/2021, New York, NY
- **Columbia University, Department of Biomedical Informatics,** 10/4/2021, New York, NY

OUTREACH AND LEADERSHIP

- **Expert scientific panel member,** NIH ML/AI Tools to Advance Genomic Translational Research Consortium**,** 2026-present
- **Public Policy Projects** roundtable "Trusted Research Environments as the Backbone for Global Genomics and Rare Disease Research**",** invited expert attendee**,** 3/3/2026**,** virtual
- **Ad Hoc Subject Matter Expertise** for All of Us Research Program Resource Oversight, NIH
- **Invited Expert,** NHGRI on Functional Variant Interpretation Community Input Discussion**,** NIH
- **Guest editor**, PLOS Computational Biology
- **Editorial Board**, Journal of Computational Biology
- NIH Center for Scientific Review ad-hoc reviewer for
    - Biodata Management and Analysis (BDMA)
    - Small Business: Computational, Modeling, and Biodata Management (MCST)
- **Poster Chair** at RECOMB 2025, Seoul, Korea
- **Program Committee**, IEEE ICHI 2024 & 2025

- **Chair and Co-organizer** at ASHG'24 featured symposium on open data sharing and privacy in precision medicine – Denver, CO
- **Invited general chair** at GenoPri'24 (Genome Privacy workshop) – San Francisco, CA
- **RECOMB-Privacy satellite steering committee,** 2024- present
- **RECOMB- Privacy founding satellite chair** at RECOMB 2024 – Boston, MA
- **Area chair** (biomedical data privacy) at ISMB 2022 / 2023 / 2024 / 2026
- **Keynote Chair** at RECOMB 2023 – Istanbul, Turkey
- **Co-organizer** of Ethics & Privacy workshop at **Pacific Symposium on Biocomputing** conference 2023 – Kona, HI
- **Chair** of Genome Privacy Panel at AMIA 2023 – Washington DC
- **Chair** of Genome Privacy Workshop at RECOMB 2022 – San Diego, CA
- **Co-organizer** of Ethics & Privacy workshop at **Pacific Symposium on Biocomputing** conference 2022 – Kona, HI
- **Program committee**, IEEE BIBM 2022
- **Tutorial organizer** on genomics applications of homomorphic encryption, ACM-BCB 2020
- **Program committee**, GenoPri Genome Privacy Workshop 2020, 2021
- **Mentor** at Athena by Women's Inclusion in STEM (https://www.athenabywistem.org), 2020
- **Program committee**, iDASH Privacy & Security Workshop 2018
- **Program committee,** RECOMB 2022-present
- **Program committee,** ISMB 2019-present
- **500 Women Scientists** New Haven Pod Co-Coordinator, 2019-2022
- Postdoctoral representative for **Yale MB&B Committee on Diversity and Climate** (2018-2019)
- **Co-organizer** of Biological Data Privacy session at **Pacific Symposium on Biocomputing** conference 2019 – Kona, HI
- **Co-chair** of Genome Security and Privacy session at **IEEE Biomedical and Health Informatics** conference 2019 – Chicago, IL
- **Spring 2018:** Panel Reviewer, Yale Institute for Biospheric Studies small grant program
- **April 2014**: Judge, Chicago Area Undergraduate Research Symposium
- **Memberships:** International Society for Computational Biology, The American Medical Informatics Association, The American Society of Human Genetics, The Biophysical Society