

Berkeley

SCHOOL OF  
INFORMATION

**Advancing  
knowledge and  
practice  
wherever  
people  
interact with  
information and  
technology**



# ABOUT

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UC Berkeley's School of Information (I School) studies the relationships between people, information, and technology.

In a world that is technology-driven, the I School is **HUMAN-CENTERED**. At the I School, interdisciplinary scholars advance knowledge the Berkeley way: by innovating, collaborating, and creating. In addition to asking "How?," at the I School we also ask "Why?"

I School faculty take a **MULTIDISCIPLINARY** approach, with interests at the intersection of technology, social sciences, and the humanities. Our current faculty's training includes the fields of computer science, economics, political science, law, linguistics, sociology, design, media studies, and classics. Located in the heart of campus, faculty collaborate closely with peers in the Colleges of Engineering; Letters & Science; Computing, Data Science, and Society; and professional schools of Law, Public Policy, Journalism, Public Health, and others.

Our research themes include those central to UC Berkeley's **PUBLIC SERVICE MISSION**, with faculty making strides on technology and social justice, on data for good, on the battle for trustworthy information, on technology to improve education, on visualizing and explaining data for wider understanding, and on technology policy questions surrounding privacy, algorithm equity, and urban economics. More recent work investigates data auditing for climate change monitoring.

**THE SCHOOL OFFERS A UNIQUE LEARNING EXPERIENCE AT THE WORLD'S GREATEST PUBLIC UNIVERSITY.** The I School is a pioneer in the delivery of exceptional online education, offering two online professional master's degrees in addition to one on-campus interdisciplinary master's degree and a renowned Ph.D. program.

## By the Numbers

4 degree programs

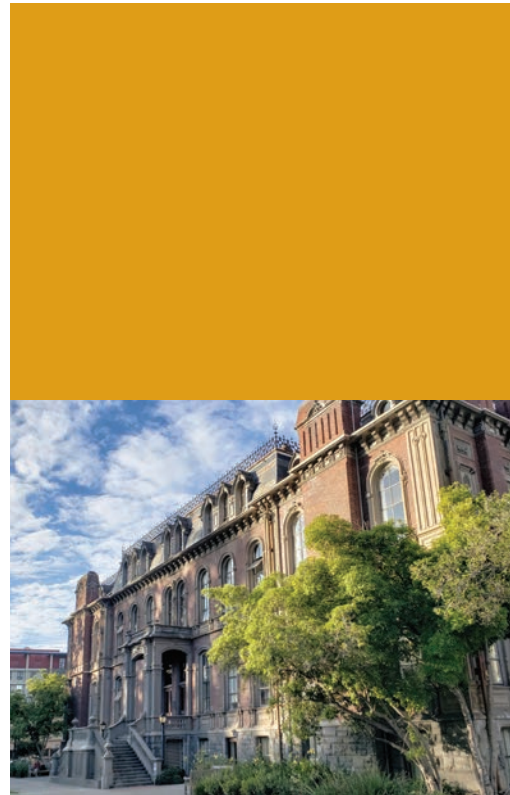
1,300+ Students

7,000+ Alumni

#1 online master of cybersecurity\*

#2 online master of data science\*

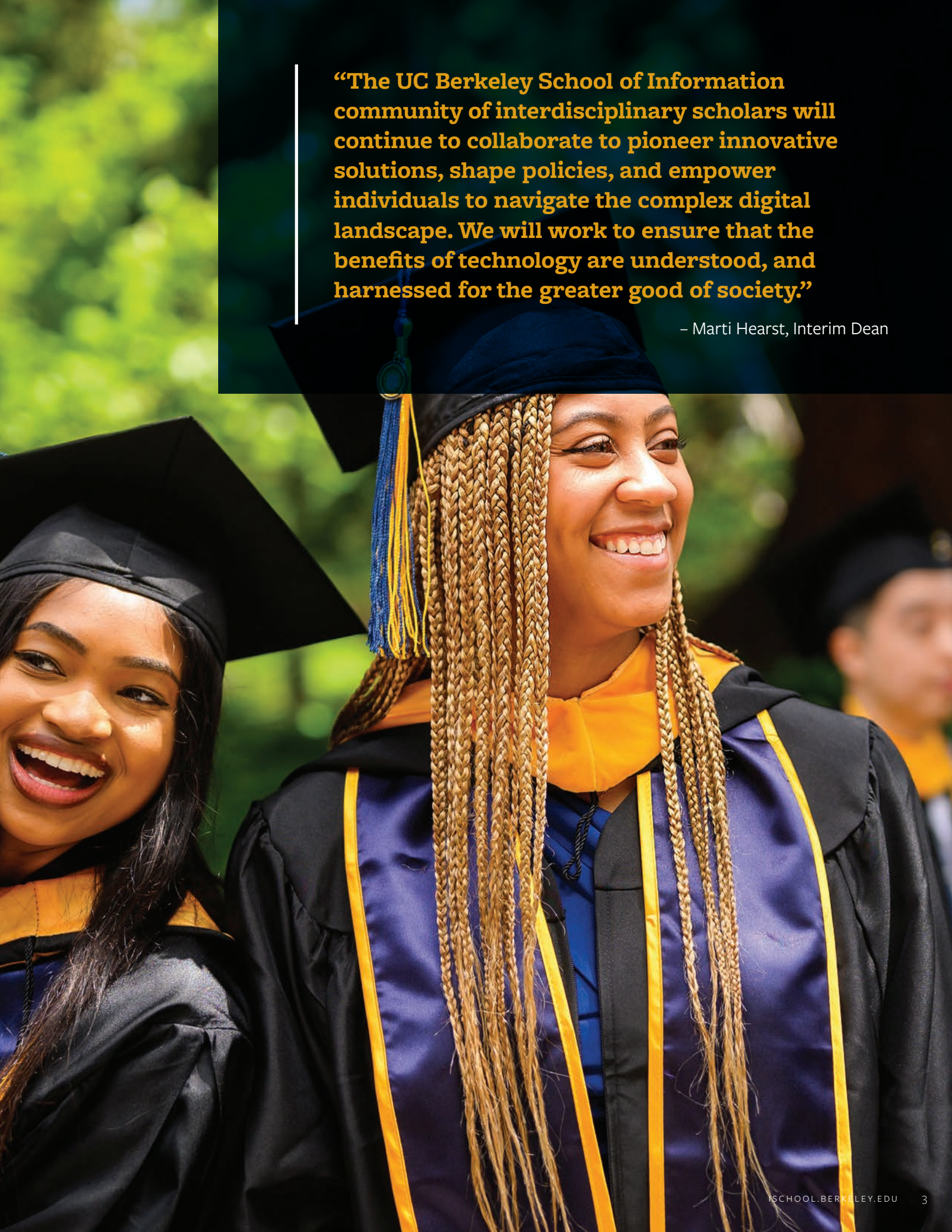
\*according to 2023 rankings by Fortune Magazine





**“The UC Berkeley School of Information community of interdisciplinary scholars will continue to collaborate to pioneer innovative solutions, shape policies, and empower individuals to navigate the complex digital landscape. We will work to ensure that the benefits of technology are understood, and harnessed for the greater good of society.”**

– Marti Hearst, Interim Dean



# OUR RESEARCH

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As society and technology evolve, I School scholars seek answers to questions of great societal impact. A sample of recent research efforts includes:

**DATA FOR GOOD:** Professor Joshua Blumenstock's research lies at the intersection of machine learning and development economics and focuses on using novel data and methods to better understand the causes and consequences of global poverty. In one project, in response to the COVID-19 pandemic, Prof. Blumenstock helped design Togo's flagship social protection program, Novissi, in collaboration with the local government to help identify those Togolese citizens with the greatest need for humanitarian support. He has also applied his work to improve the accuracy, transparency, and inclusiveness of algorithms for assessing credit risk for unbanked and underbanked households in emerging markets.

**RESTORATIVE JUSTICE IN TECHNOLOGY:** Restorative justice takes the view that the people who have been harmed might be better served by processes repairing the harm than by punishment. Assistant Professor Salehi's projects take a restorative justice stance and re-envision content moderation on online platforms through this lens. Another project found that current algorithmic-matching algorithms do not allow people to express community goals over their personal preferences, and proposed remedies for this problem.

**INFLUENCING TECHNOLOGY POLICY:** Professor Deirdre Mulligan brings legal expertise and a values-driven methodology to technology policy issues, working with technical subject matter experts to recast that technology in a legal and policy framework. She has applied these techniques to matters as diverse as autonomous vehicle design and privacy protection algorithms. Professor Anno Saxenian reexamines innovation policy through the lens of the current era of cloud computing, arguing that the public sector has a regulatory role as well as a nurturing one to play in fostering innovation ecosystems.

**UNCOVERING GENERATIVE AI'S UPSIDES AND DOWNSIDES:** For tools like ChatGPT, key questions revolve around their development and use. Uncovering hidden information about Large Language Model (LLM) training datasets can help answer questions about the accuracy, potential biases, and potential copyright infringements that result from their use. Professor David Bamman's recent research used special techniques to reveal this hidden information, providing evidence that one major provider was trained on copyrighted books. Professor Marti Hearst and colleagues have shown that an LLM-powered text editor that includes verification and auditing capabilities can improve the editing experience and help authors identify and fix errors produced by these models.

**CREATING USABLE DATA SCIENCE TOOLS:** Associate Professor Aditya Parameswaran's research has made substantial contributions to making one of the most widely used tools in data science more scalable, efficient, and reliable to use. He and collaborators have put the pandas framework into a stronger theoretical foundation, applying formal data modeling from the theory of databases, and showing that this was expressive enough to represent the pandas data model.

**COMBATING MISINFORMATION:** Professor Coye Cheshire's research sheds light on the processes by which people adopt conspiracy theories, and under what circumstances debunking does and does not have an effect. Professor Hany Farid's work employs a combination of technical approaches to image processing, human-centered investigation, and algorithmic reverse engineering to study the effects on the world of the ever-increasing ability of technology to create false images.



## The Center for Long-Term Cybersecurity

Founded in 2015, the mission of the Center for Long-Term Cybersecurity (CLTC) is to help decision-makers act with foresight, and expand who has access to and participates in cybersecurity. CLTC acts as a convening platform, translator, and two-way bridge between cutting-edge academic research and the needs of decision-makers in government, industry, and civil society.

A multidisciplinary and inclusive approach drives the center's research agenda. Major programs include Cybersecurity Futures, AI Security, Public Interest Cybersecurity, and Internet Infrastructure Security. CLTC research has contributed to policy and standards efforts including the NIST AI Risk Management Framework, the National Cyber Workforce and Education Strategy, and corporate governance of data, cybersecurity, and AI. Since its founding, CLTC has also supported over 100 graduate students with fellowships and research grants.

CLTC, in collaboration with the I School, hosts the Citizen Clinic, a trailblazing public-interest digital security clinic. Through a model similar to university clinics in law and medicine, it trains teams of students to help civil society organizations build the capabilities they need to proactively defend themselves against cyber attacks. CLTC-affiliated faculty and staff co-founded the international Consortium of Cybersecurity Clinics, which has expanded the reach and visibility of university-based cybersecurity clinics, and lowered the barriers for other institutions of higher education to successfully establish their own clinics.

### **CREATING TECHNOLOGY TO SUPPORT MENTAL HEALTH:**

Professor Kimiko Ryokai converts the impersonal assumptions behind the design of technology to make it more fitting for human mental health. For instance, her answer to the “quantified self” movement is to devise technology to help loved ones capture and share one another’s laughter in a physical form. Her Heart Sounds Bench uses technology to convert the utilitarian goals of the “smart city” technology-centric movement into a method of bringing a sense of belonging to the urban environment.

### **CRITIQUING TECHNOLOGY’S INFLUENCE ON SOCIETY:**

Professor John Chuang’s work with biosensors discovered the inability of subjects’ attempts to hide their intent when using virtual reality technology augmented with algorithmic predictions. Professor Morgan Ames’s work has shown how the culture of hype and optimism behind technology development can have negative social consequences, as demonstrated in the unsuccessful “One Laptop Per Child” project. Research Scientist Xiao Qiang studies technology and human rights, AI-empowered surveillance, and digital authoritarianism.



# FACULTY SPOTLIGHT: HANY FARID

Professor Hany Farid, a noted pioneer in the field of digital forensics, joined the School of Information in 2019. The goal of digital forensics is the development of computational and mathematical techniques for authenticating digital media. Professor Farid's lab employs a combination of technical approaches to image processing, human-centered investigation, and algorithmic reverse engineering to study the effects on the world of the ever-increasing ability of technology to create false images.

Farid's book *Fake Photos* captures the state of the art in digital forensics in an accessible manner intended to make these techniques for identifying fake photos more widely understood. The book reflects on and clearly explains the details, in terms of strategy, in mathematical and in physical terms. In a 2020 article published in *PNAS*, Farid and his co-author critique the use of pattern manipulation of photographs by the criminal justice system, and propose a replicable method to determine the reliability of these techniques prior to their use in legal proceedings. This and other work has earned him an Alfred P. Sloan Fellowship and a John Simon Guggenheim Fellowship.

Professor Farid's work goes beyond the lab, calling out bad actors, and working directly with industry to develop and deploy technology for a wide range of critical social ends. His past work has included efforts to protect children from online sexual predators and efforts to fight politically motivated disinformation campaigns. In recent years, as generative AI and deepfakes have grown more accessible, Farid has spoken out about the importance of platform accountability and the dangers of misinformation. He has provided testimony to the U.S. House Energy & Commerce Committee on the topic of disinformation.

Dr. Farid has served on TikTok's advisory board and recently joined the Content Authenticity Initiative, a community working to promote the adoption of the open industry standard for content authenticity and provenance. At UC Berkeley, he participates in the Berkeley Artificial Intelligence Lab, Berkeley Institute for Data Science, Center for Innovation in Vision and Optics, Development Engineering, Vision Science Program, and Center for Long-Term Cybersecurity.



# OUR FACULTY

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**MORGAN G. AMES** (*Assistant Professor of Practice*) researches the ideological origins of inequality in the technology world, with a focus on utopianism, childhood, and learning. Her recent book *The Charisma Machine: The Life, Death, and Legacy of One Laptop per Child* (MIT Press, 2019) won the 2020 Best Information Science Book Award, the 2020 Sally Hacker Prize, and the 2021 Computer History Museum Prize.



**DANIEL ARANKI** (*Assistant Professor of Practice*) focuses on topics around predictive health, telehealth, and cybersecurity. He studies the efficacy and security of remote medicine. He also serves as executive director of the Berkeley Telemonitoring Project.



**DAVID BAMMAN** (*Associate Professor*) works in the areas of natural language processing and cultural analytics, applying NLP and machine learning to empirical questions in the humanities and social sciences. He recently received a grant from the Mellon Foundation for a text and data mining project with the UC Berkeley Library.



**JOSHUA BLUMENSTOCK** (*Associate Professor*) uses novel data and methods to try to improve the lives of disadvantaged people around the world. He was awarded the prestigious NSF Career Award in 2020, and serves as the Public Policy Director at the Global Policy Lab, and Faculty Co-Director for the Center for Effective Global Action (CEGA).



**JENNIFER CHAYES** (*Professor*) researches phase transitions in computer science and structural and dynamical properties of networks including modeling and graph algorithms. She is dean of the College of Computing, Data Science, and Society.



**COYE CHESHIRE** (*Professor*) studies sociological social psychology and group processes, with a focus in social exchange, cooperation, and trust in technology-mediated environments. Recent research examines trust in online health information, affordances and limitations of searching for health information online, and remediation of online harms for adolescents.





**JOHN CHUANG** (*Professor*) focuses on climate informatics, biosensory computing, and incentive-centered design. His lab has examined brainwave authentication using passthoughts, affective biosensing, embodied decision-making, and privacy of ubiquitous sensing, and he is now focused on ways informatics and computing can contribute to efforts to mitigate and adapt to the effects of climate change.



**MARTI HEARST** (*Interim Dean and Professor*) focuses on search engines and their user interfaces, tools for the digital humanities, social technology, computational linguistics, teaching at scale, information visualization, and usability in websites. The author of *Search User Interfaces*, she was named an ACL Fellow in 2022.



**CHRIS JAY HOOFNAGLE** (*Professor of Practice*) helps students from different disciplinary perspectives understand the effects of law on technology. His research and teaching examines internet law, information privacy, consumer protection, cybersecurity, computer crime, and regulation of technology, and he recently published the book *The Quantum Age*.



**D. ALEX HUGHES** (*Assistant Adjunct Professor*) researches how group identity shapes political access and how social connections shape political behavior. Currently, he's interested in how voters' group identity shapes the electoral services they receive, specifically access to the ballot on Election Day.

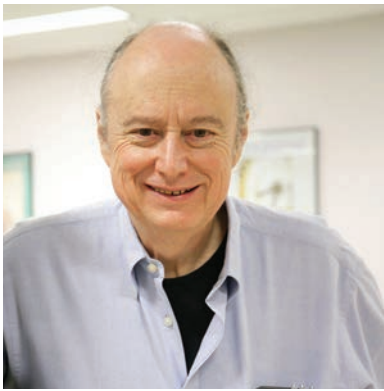


**CORNELIA ILIN** (*Assistant Professor of Practice*) applies a range of methodologies, including causal inference, econometrics, and machine learning to timely issues in medicine, healthcare, and the environment.



**PAUL LASKOWSKI** (*Associate Adjunct Professor*) studies the interaction between computer networks and economic incentives. He applies his research findings to contemporary policy debates, including digital content distribution, future internet architectures, and net neutrality.





**CLIFFORD LYNCH** (*Adjunct Professor*) is an expert on stewardship of the scholarly and cultural record in the digital age and serves as director of the Coalition for Networked Information (CNI).



**JEFFREY MACKIE-MASON** (*Professor*) is interested in human information behavior online, and the design and performance of information systems and digital content. At UC Berkeley he serves as University Librarian and Chief Digital Scholarship Officer.



**DEIRDRE MULLIGAN** (*Professor*) explores the legal and technical means of protecting values such as privacy, freedom of expression, and fairness in emerging technical systems. Current work examines the legal and policy implications of using predictive machine learning tools in different contexts. She is currently on leave serving as the Principal Deputy U.S. Chief Technology Officer in the White House Office of Science and Technology Policy.



**ADITYA PARAMESWARAN** (*Associate Professor*) develops systems for “human-in-the-loop” data analytics — simplifying how end-users leverage and make sense of large and complex datasets — by synthesizing techniques from database systems, data mining, and human-computer interaction. He was awarded the Sloan Research Fellowship in 2020 and co-directs Berkeley’s Effective Programming, Interaction, and Computation with Data (EPIC) Lab.



**DAVID REILEY** (*Adjunct Professor*) is passionate about the use of field experiments in economics and social sciences. In addition to the I School, he is a distinguished scientist at SiriusXM Pandora.



**MICHAEL RIVERA** (*Assistant Professor of Practice*) researches how to increase civic and political engagement, particularly how campaigns and non-partisan groups can use data science to increase turnout among minority and low propensity voters.



**KIMIKO RYOKAI** (*Associate Professor*) studies representation, physicality, and interactivity of personal data and information systems, particularly in the context of mental health, social networks, and educational applications. She and a team of researchers from the Lawrence Hall of Science recently received a significant grant from the National Science Foundation to build welcoming and inclusive informal science learning spaces for Indigenous youth.



**NILOUFAR SALEHI** (*Assistant Professor*) studies human-computer interaction, social computing, and participatory and critical design. She was accepted to the William T. Grant Scholars Program’s class of 2027 to study the unintended impacts of school assignment algorithms. She has recently received grants for her work developing language translation technology in high stakes settings, and restorative justice in social media.



**ANNALEE SAXENIAN** (*Professor*) is the former dean of the I School and author of the internationally acclaimed book, *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*. She researches regional economies and the conditions under which people, ideas, and geographies combine and connect into hubs of economic activity.

# STUDENT SPOTLIGHT: SEYI OLOJO

Ph.D. student Seyi Olojo realized the possibilities of data while studying environmental science as an undergrad at Barnard College. Post-graduation, she worked in advertising technology, where she tracked where ads were going and the people they affected. She eventually participated in a study about targeted weight-loss advertising, where she became aware of the harms that these algorithms could ultimately cause. To investigate further, she joined the School of Information, dedicated to exploring the “social life of data” and ways in which data collection and its application within algorithms can harm marginalized communities.

Since beginning her predoctoral studies in 2020, Olojo has written extensively on the topic of targeted advertising, looking into weight loss ads and their effects on eating disorders as well as content recommendation algorithms and anti-fertility ads. Her research earned her various grants from Berkeley and other prestigious institutions, including a National Science Foundation (NSF) Graduate Research Fellowship Program award and — most recently — a Fulbright Scholarship to Germany, where she will work with and study a Berlin-based environmental open-data collective on their data collection practices.







# ACADEMICS

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I School programs challenge students to think beyond what's currently possible and envision solutions to future problems. The school's four degree programs, two on campus and two online, encourage creativity and collaboration while maintaining the academic rigor that Berkeley is known for.

**PH.D. IN INFORMATION SCIENCE** The Ph.D. in Information Science equips scholars to develop solutions and shape policies that influence how people seek, use, and share information.

*Ph.D. students Lauren Chambers, Chase Stokes, and Naitian Zhou received the 2023 NSF Graduate Research Fellowship. Zhou uses natural language processing to measure the extent to which a person feels a sense of belonging within a community. Stokes explores the intersection of language and visualization to improve the way researchers communicate visual information about data. Chambers's research centers around the role of Black leaders and Black schools of thought on advocacy against algorithmic injustices.*

**MASTER OF INFORMATION MANAGEMENT AND SYSTEMS** The Master of Information Management and Systems (MIMS) trains students for careers as information professionals and emphasizes small classes and project-based learning.

*In the summer of 2023, MIMS students Sarah Barrington, Romit Barua, and Gautham Koorma presented their deepfake detection research at the 2023 Nobel Prize Summit. The research describes three techniques for differentiating real from cloned voices, ranging from human-perceptual to deep learning features. The learned features consistently yield an equal error rate between 0% and 4% in detecting real vs. synthesized voices.*

**MASTER OF INFORMATION AND DATA SCIENCE** The Master of Information and Data Science (MIDS) program trains data scientists to manage and analyze the onslaught of large datasets and become leaders in their fields through experiential learning and a unique high-touch online degree.

*In the fall of 2022, MIDS students Trevor Johnson, Matt Lyons, Anand Patel, and Michelle Shen presented their capstone project at the Stanford Maternal and Child Health Symposium. The project addressed the impact of air pollution on certain pediatric health conditions and went on to be recognized with the outstanding capstone project award for MIDS.*

**MASTER OF INFORMATION AND CYBERSECURITY** The Master of Information and Cybersecurity (MICS) prepares cybersecurity leaders with the technical skills and contextual knowledge necessary to develop solutions for complex cybersecurity challenges.

*As a MICS student, David Ng presented research on password managers at the RSA Conference. In his research, he found that many users appear to be using password managers without taking advantage of the features necessary to get the security benefits.*

**UNDERGRADUATE COURSES** I School faculty contribute substantially to undergraduate education, teaching courses vital to the data science undergraduate degree.

# OUR ALUMNI

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## Our alumni have taken many paths, from founding companies to engaging in academic research.

I School alumni are changing the world and how it interacts with technology for the better. They bring their interdisciplinary talents to private sector companies like Apple and Salesforce, in government entities like the California Privacy Protection Agency, nonprofits like the Center for Democracy & Technology (CDT), in academia, healthcare, and beyond. They regularly give back to the community and share their knowledge and expertise, whether as participants in our robust mentorship program, sharing advice on career panels, or hosting meet-ups for networking events.

Recent alums **NOURA HOWELL** (Ph.D. '20) and **RICHMOND WONG** (Ph.D. '20), took to the academic job market and are now assistant professors at the Georgia Institute of Technology. Howell teaches about topics such as human-centered design, tangible design, physical computing with microcontrollers and circuits, and introductory computer science. Wong primarily teaches about social values, ethical issues, and work involved in technology production and use.

Social researcher **DANAH BOYD** (Ph.D. '08) founded the research institute Data & Society, which helps build an evidence base to shed light on the social implications of data, automation, and AI. boyd is a partner researcher at Microsoft Research and a distinguished visiting professor at Georgetown University whose scholarship has ranged from examining teens' engagement with social media to interrogating the politics behind the making of the US census data.

While studying at the I School, **DORIS LEE** (Ph.D. '21) teamed up with Professor Aditya Parameswaran to create Ponder, a tool that helps data scientists clean and summarize their data using automation. Lee was named as a member of the *Forbes* "30 Under 30" list in late 2022.

Innovative alumni have founded companies, like **HOLLY LIU** (MIMS '03), who co-founded mobile gaming company Kabam and was our first alumna to launch a "unicorn" start-up. Entrepreneur **PRAYAG NARULA** (MIMS '12) founded Lead Genius, which began as an I School master's project, and user research platform Marvin, where he is currently CEO.

**KEN-ICHI UEDA** (MIMS '08) created the nature observation application iNaturalist, first as an I School master's project. The popular app has since seen over 120 million observations and has been referred to as the "nicest place online" by the *New York Times*.

**JOE HALL** (Ph.D. '08) is a trailblazer in technology policy and has held critical leadership roles at the Center for Democracy & Technology and Internet Society. Privacy expert **JEN KING** (Ph.D. '18) is the Privacy and Data Policy Fellow at the Stanford Institute for Human-Centered Artificial Intelligence (HAI) researching the intersection of information privacy, human-computer interaction (HCI), policy, and artificial intelligence.

Others are leaders in industry. **STEVEN BOOTH** (MICS '20) is Vice President of Product Marketing for detection and response at Salesforce and lectures in the MICS program. **SHARON LIN** (MIDS '15) is Vice President of Analytics & Data Science at growth equities investment firm Summit Partners and started a graduate fellowship in data science for MIDS students who show a commitment to gender equity.



# ALUMNI SPOTLIGHT: ASHKAN SOLTANI

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A graduate of the Master of Information Management and Systems program, Ashkan Soltani, '09, has spent over two decades building a career at the intersection of security, privacy, and technology policy.

As an I School student in 2009, Soltani began researching common practices of collecting, sharing, and analyzing user data. His findings became the basis for his final project, “KnowPrivacy,” which sought to influence policy governing data collection and sharing practices of popular internet sites. This landmark paper landed him in the public eye, catching the attention of publications such as *The Wall Street Journal*, the *Washington Post*, and government agencies like the Federal Trade Commission. There, he served as Chief Technologist and was tapped to join the White House’s Office of Science and Technology Policy as a Senior Advisor to the U.S. Chief Technology Officer. Ashkan is a co-author of the *The Washington Post*’s National Security Agency series that was awarded the 2014 Pulitzer Prize for Public Service journalism.

In recent years, Soltani played a crucial role in the creation of California’s new privacy laws; in particular, he spearheaded the California Consumer Privacy Act of 2018 (CCPA) and the California Privacy Rights Act of 2020 (CPR). As a result, his expertise has brought him to his current role: Executive Director of the California Privacy Protection Agency, where he oversees the Agency’s execution of the CCPA, enforcement activities, rulemaking, public awareness, and building and leading Agency staff.





## DIVERSITY, EQUITY, INCLUSION, BELONGING, & JUSTICE (DEIBJ)

The School of Information is deeply committed to diversity, equity, inclusion, belonging, and justice. These core values inform the school's curriculum, community, and work in the information sciences and beyond.

The majority of I School graduates will enter a technology sector that struggles on many fronts with equity and inclusion. The school aims to alter the ecosystem by fostering inclusion and preparing graduates to continue driving change long after they've left.

In December 2020, the I School adopted a five-year Equity and Inclusion Strategic Plan for 2020–25 structured around five goals. A working group of faculty, staff, and graduate students actively works to progress these goals. The I School Graduate Scholars program was established to provide fellowship support for students who have overcome challenges in pursuing higher education, shown leadership in diversity, equity, and inclusion, and/or plan to do research on inequality.





# LOOKING FORWARD...

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Our research continues building strength in human-computer/human-machine interaction; information/data security, privacy, and policy; and applied data science. Our methods encompass those from social sciences, humanities, and computer science. In each of these areas, we are committed to improving and examining the applications of information and technology to improve the human condition, and to meeting the needs of the state of California.

Looking forward we plan to pursue greater strength for UC Berkeley in several areas:

In **TECHNOLOGY POLICY**, both to support public policy/government, in the design and deployment of technology, and public interest technology, to illuminate the paths to resilient societies that promote democratic values.

In **AI EQUITY**, focused on employment, algorithmic discrimination, and computerized surveillance.

In **HUMAN-COMPUTER INTERACTION (HCI)** and **INFORMATION VISUALIZATION**, in which our alumni consistently excel in industry and the public domain.

In **PRIVACY AND SECURITY**, which are more important now than ever as we increasingly rely on computing and information technology.

In **INFORMATION**, in understanding how information is structured and used, and in how to ensure its accuracy and reliability to support democracy and ensure a resilient society, and help combat the existential threat of climate change.

In **DIGITAL HUMANITIES**, to bring the humanities' understanding of the human condition to shine light on the world of information technology.

In **HEALTH HCI**, in which we have identified a key area of synergy in the incorporation of human-centered design, as a way to integrate the community voice into the design of intelligent healthcare systems.

# Berkeley

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