

BOSTON
UNIVERSITY

FY23

Annual Report

HARIRI INSTITUTE

BOSTON UNIVERSITY RAFIK B. HARIRI INSTITUTE FOR COMPUTING AND COMPUTATIONAL SCIENCE & ENGINEERING



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LETTER FROM THE DIRECTOR

I complete my first year as Director of the Hariri Institute for Computing and Computational Science & Engineering with deeper understanding of the complex research hub the Institute has become. I have been impressed by the many significant and impactful accomplishments of our multidisciplinary community, consisting of more than 400+ faculty affiliates and including thought leaders, problem solvers, scholars, and pioneers. They are leveraging the full power of computing, computational, and data-driven science and engineering to create new knowledge, solve hard problems, and create change on a national and international scale. Our community spans 66 departments and 13 schools and colleges. Such diversity underscores the significance of computing, and computational science and engineering in nearly every field, and highlights the Institute's critical role in catalyzing cross-disciplinary collaborations. The Institute has been working hard toward achieving our mission of incubating and accelerating research convergence and integrated activities with social impact. I am happy to report that we have made significant progress.

Integrating the Center for Information & Systems Engineering (CISE)

The Center for Information & Systems Engineering (CISE) joined our federation of affiliated centers and initiatives and is now co-located with our new administrative offices in the new iconic Boston University Center for Computing & Data Sciences. CISE, a university-wide interdisciplinary research center, brings with it over 50 faculty and 100 doctoral student researchers, many of whom are actively engaged with Hariri Institute programs, such as the AI Research Initiative, the Center for Reliable Information Systems and Cyber Security (RISCS), and the Red Hat Collaboratory. With our complementary missions of advancing interdisciplinary research with societal impact, we look forward to deepening our collaborations for maximum impact.

Strengthening Industry Engagement

This year, we made progress in developing academic-industry partnerships to advance research, student opportunities and resources. Beginning early this year, the Robotics and Autonomous Systems Teaching and Innovation Center

(RASTIC) is building its new home in a central Commonwealth Avenue location. RASTIC represents a \$9-million initiative jointly funded by the Massachusetts Technology Collaborative and Boston University to support experiential learning by M.S. students in the College of Engineering's Robotics & Autonomous Systems program. Twelve students completed external internships with industry, such as Amazon Robotics and Vicarious Surgical, in active collaboration with BU faculty. RASTIC also initiated a new partnership with Amazon Robotics that provides full tuition support, a housing allowance, and a guaranteed internship at Amazon Robotics to underrepresented minorities pursuing a master's degree.

BU faculty and students have been interacting with industry practitioners working in open-source software communities through the Red Hat Collaboratory. Through this Hariri Institute Initiative, over \$2.1 million was awarded to BU faculty and students to advance innovative research projects.

The Mass Open Cloud Alliance (MOC-A) held a two-day workshop in March that brought together its unique community of researchers, users, and industry to celebrate what has been accomplished and help define the MOC-A strategy moving forward. MOC-A is emerging as an important resource to support cloud computing and AI on demand, geared towards researchers and offering better alternatives to commercial cloud services or owning dedicated servers.

Greater Boston employers and the Boston Mayor's Office of Women's Advancement engaged with the Boston Women's Workforce Council (BWWC), hosted at the Institute, and our own Software & Application Innovation Lab (SAIL) to kick off the 5th Gender and Racial Wage Gap Measurement effort. Employers are anonymously sharing payroll data with BWWC using a SAIL-developed Secure Multiparty Computation (MPC) application. This effort reflects a first-in-the-nation approach to providing a community snapshot of progress made toward closing gender and racial wage gaps in Greater Boston. The data collection program is the only effort in the nation that measures wage gaps using this innovative approach that guarantees the privacy of the data from each contributing company.

Faculty affiliates engaged with industry on a number of grant projects, including Lei Tian, Assistant Professor in Electrical

& Computer Engineering (ECE), who received a \$1.3 million Samsung award for computational imaging research. David Starobinski, also a Professor in ECE and Systems Engineering, continued work with Microsoft-Affirmed Networks on data-driven optimization for 5G Mobile Edge Computing. Starobinski also received a renewal award to continue work for the Honda Research Institute in Europe on predicting product vulnerabilities.

Focused Research Programs (FRPs) Combat Fake News

The FRPs are the Institute's signature mechanism to form and support large interdisciplinary teams of faculty, helping them coalesce around an important emerging topic with social impact, seek sponsored projects to support long-term research, and achieve national prominence. Two of our FY23 FRPs organized events to highlight the economic, political and behavioral implications of false narratives propagating across social media and how they continue to negatively affect society. Specifically, the Predicting and Preventing Epidemic to Pandemic Transitions FRP, funded with \$1 million from the National Science Foundation (NSF), cosponsored with the Center for Emerging Infectious Diseases Policy & Research (CEID) a keynote address by the U.N. Under-Secretary-General for Global Communications Melissa Fleming. Fleming emphasized that the United Nations is combating mis- and disinformation in three areas: COVID-19, conflict, and climate change. The Data and Misinformation in an Era of Sustainability and Climate Change Crises FRP organized a full-day research symposium entitled "Taking on Climate Lies," featuring state policy leaders, academic experts and a BU Deans' panel that discussed these issues and potential solutions. For FY24, the Institute is investing more than \$400K in four FRPs to focus on four diverse topics: modeling to aid a Mars exploration mission, algorithms for autonomous robotic systems in rehabilitation from disease and injuries, AI approaches for brain health and brain diseases, and AI modeling to support action that mitigates the health effects of climate change in urban areas that often lead to inequitable health outcomes.

Data & Computing for Social Impact

Hariri Institute researchers and staff continued to devote their energy to advancing research around topics of diversity, equity, and inclusion. Deaf studies scholar Naomi Caselli, Co-Director of the AI and Education Initiative and Assistant Professor at BU Wheelock College of Education & Human Development, received more than \$670,000 from NIH to advance research in American Sign Language (ASL) vocabulary acquisition skills. For this project, Caselli, in collaboration with

SAIL, developed an open-source database called ASL-LEX that has recordings of thousands of signs. Caselli's team is using computer vision to take measurements of the recordings to determine how humans retrieve signs as they produce them.

Cara Stepp, a Research Fellow at the Hariri Institute and Professor in Speech, Language, and Hearing Sciences at BU College of Health & Rehabilitation Sciences: Sargent College, was awarded a new five-year, \$3.5 million grant from NIH for a comprehensive, longitudinal study to ascertain the source of specific Parkinson's-related speech problems. The groundbreaking research will provide a roadmap for future evidence-based treatment to improve speech clarity and quality of life for patients.

These are just a few examples of the transformative research happening at the Hariri Institute. I invite you to browse our website and follow up with me or any of the Hariri Institute's Center and Initiative Directors or members of our growing community of Fellows and Faculty Affiliates.

It Takes a Village

All of this fascinating research and event organization would not have been possible without the fantastic support by our Institute staff. Their dedication, innovation, teamwork, and leadership are critical for core functions such as grant and project management, event organization, and publicizing faculty and student achievements through our website and social media platforms. You are welcome to contact the Hariri Institute's administration with any questions about future research, events, or seminars.



Ioannis (Yannis) Paschalidis

Director, Rafik B. Hariri Institute
for Computing and Computational
Science & Engineering

Distinguished Professor of Engineering, Department of
Electrical and Computer Engineering, Division of Systems
Engineering, and Department of Biomedical Engineering

Founding Professor, Faculty of Computing & Data Sciences

HARIRI INSTITUTE AT A GLANCE

400+

Faculty Affiliates

66

Departments

13

Schools

2,980+

FY23
Publications

3.54k

Total Followers
(+22.24%)



FY23 COMMUNITY ENGAGEMENT & PROMOTION

30

Science
Stories

1

NSF-featured
Research Story

5

Of the Top 10 Most-Read
BU Brink Science Stories

1.65M

Social Media Reach



100+

Events

5000+

Total Attendees

AWARDS AND ACHIEVEMENTS

**\$26
MILLION
EXPENDITURE**

**HARIRI-LED
GRANTS**

**19 NEW
AWARDS**

**\$11.4
MILLION**

New FY23 Hariri-Led
and Enabled Funding

Programs Funded (Hariri Institute Investments)

\$465,459

Awarded to BU Faculty
and Graduate Students

\$60,000

Awarded to Junior
Faculty Fellows

\$370,459

Awarded Across Three
Focused Research Programs

\$35,000

Awarded to Graduate
Student Fellows

Grant Highlights

PIPP Phase I: Predicting and Preventing Epidemic to Pandemic Transitions. National Science Foundation. \$1 Million. Led by Yannis Paschalidis (ENG, FCDS)

Computational Mesoscope for Ultrafast Multiscale 3D Imaging. Chan Zuckerberg Donor Advised Fund (DAF). \$1.3 Million. Led by Lei Tian (ENG).

Hardening Development Toolchains Against Emergent Execution Engines (HARDEN). DARPA subaward via Riverside Research Institute. Phase 1 \$97,000; Contingent funding: \$1 Million. Led at BU by Alley Stoughton (CAS).

Beverly Setzer (GSF 2020) won an NIH Ruth L. Kirschstein National Research Service Award (NRSA) Individual Predoctoral Fellowship (F31) for neuroimaging research.



MISSION STATEMENT

An incubator and convergence accelerator in a university setting, the Rafik B. Hariri Institute for Computing and Computational Science & Engineering initiates research convergence and accelerates integrated initiatives with social impact at the nexus of the computational and data sciences.

It achieves this mission by promoting discovery and innovations across a broad set of disciplines, inspired by challenges in engineering; social, health and management sciences; and the arts. Through the use of computational and data-driven approaches, diverse groups of faculty, students, and staff work together to transform research.

HARIRI INSTITUTE

BOSTON UNIVERSITY RAFIK B. HARIRI INSTITUTE FOR COMPUTING AND COMPUTATIONAL SCIENCE & ENGINEERING

CONVERGE

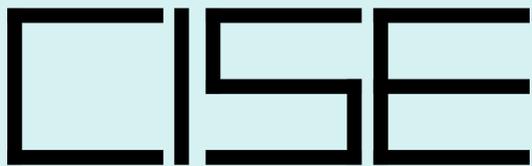
COMPUTE

TRANSFORM

FY23 HIGHLIGHTS

CISE Joins the Hariri Institute

CISE joined the Hariri Institute's federation of centers and initiatives. Ayse Coskun was appointed CISE Director, taking the helm from Yannis Paschalis who was appointed Hariri Institute Director. CISE brings with it 50+ faculty and 100+ student researchers as well as postdoctoral researchers and visiting scholars from nine different departments, divisions and academic units across Boston University.

The logo for the Center for Information & Systems Engineering (CISE) features the letters 'CISE' in a bold, black, sans-serif font. The 'C' is a simple square outline, while the 'I', 'S', and 'E' are solid black blocks.

CENTER FOR INFORMATION & SYSTEMS ENGINEERING

Red Hat Collaboratory Research Incubation Awards

The Red Hat Collaboratory awarded 19 projects from BU faculty members and industry collaborators, totaling more than \$2.1 million in funding. Additionally, four undergraduates received funding for open-source projects, totaling \$31,000 that aim to improve the security, efficiency, and intelligence of computing systems.



Red Hat

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Mass Open Cloud (MOC) Alliance

The MOC Alliance held a two-day workshop that featured over 70 speakers, 250 in-person attendees, and hundreds of virtual attendees, including 30 companies, 10 institutions of higher education, and multiple government agencies. Sessions covered research motivated by experience with a real cloud, the impact research has already had on upstream open source projects, and how some projects are starting to impact services that are part of the Alliance.



Software & Application Innovation Lab (SAIL)

SAIL embarked on a significant step towards enhancing their technical landscape – the implementation of advanced microservices. Microservices is a cutting-edge architectural and organizational approach to software development that makes applications easier to scale and faster to develop, fostering enhanced agility and accelerating time-to-market for new features. SAIL has developed microservices for authentication, file storage and permissioning, notification and data analytics, which have been used to empower many projects within their portfolio of work.



Software & Application
Innovation Lab

HARIRI INSTITUTE FOCUSED RESEARCH PROGRAMS

The Institute's FRPs are designed to facilitate research convergence by providing 'scaffolding' for groups to coalesce in sustainable ways, with the goal of accelerating research for future funding and broader impact. Learn more about them:

FY23 Focused Research Programs

Quantum Convergence

The Quantum Convergence FRP is led by Andrei Ruckenstein, Professor and Chair of the Department of Physics. The goals are to launch broad conversations and collaborations across BU that reveal cross-cutting themes around quantum science and engineering, which will translate into competitive large-scale proposals and highlight and promote quantum research to the general public.

In FY23, this FRP held one workshop focusing on outreach initiatives with education leaders and industry partners. Event speakers included: Peter Love, Professor of Physics, Astronomy and Computer Science, Tufts University; Brian Swingle, Associate Professor of Physics, Brandeis University; and Alex Sushkov, Assistant Professor of Physics and Electrical and Computer Engineering, Boston University. Over 60 people attended.

Informal scientific discussions of relevant topics were also discussed at biweekly/weekly lunch meetings with Physics, Chemistry, Computer Science, and Engineering faculty. Additionally, a number of academic, training and outreach programs are under development.

The FRP also published its first working paper acknowledging the Quantum Convergence FRP: Chamon, C., Mucciolo, E.R., Ruckenstein, A.E., & Yang, Z. (2023). Can black holes be both fast and thorough scramblers? arXiv:2304.09885 [quant-ph]

Predicting and Preventing Epidemic to Pandemic Transitions

The Predicting and Preventing Epidemic to Pandemic Transitions FRP, funded by the National Science Foundation (NSF), is led by Yannis Paschalidis (BU ENG), Nahid Bhadelia (BU CEID), Eric Kolaczyk (McGill Math/Stats), Diane Joseph-McCarthy (BU BTEC, BME) and Jon Epstein (EcoHealth). The FRP goal is to develop a comprehensive strategy and the required science base for predicting and preventing future pandemics. This Phase I project will engage a large interdisciplinary team and a network of collaborators from EcoHealth Alliance to develop models that can identify location hot spots for pathogens that could cause an outbreak, detect disease anomalies in healthcare settings, predict patient outcomes, characterize pathogen spread, and determine best methods for response.

In collaboration with CEID, on Sept 30, the Institute hosted UN Under-Secretary-General for Global Communications Melissa Fleming for a keynote conversation focused on the evolving role of mis- and disinformation in the context of public health communications, including its role in pandemic preparedness and response.

This FRP organized a Distinguished Speaker Series entitled "Data-Driven Approaches to Prevent the Next Pandemic" that was cosponsored by School of Public Health Population Health Data Science Pro-

gram & CEID. Event speakers included Mark Lurie, Associate Professor of Epidemiology and Director of the International Health Institute, Brown University; John Drake, Regents' Professor, Distinguished Research Professor, and Director of the Center for the Ecology of Infectious Diseases, University of Georgia; and Lauren Meyers, Cooley Centennial Professor and Director of the Center for Pandemic Decision Support, University of Texas at Austin. Over 100 people attended this speaker series.

A March 22 Distinguished Speaker Seminar was also cosponsored with the Faculty of Computing and Data Sciences featuring Andrew Stokes (SPH) and Yannis Paschalidis who presented on the topic of excess mortality as modeling methods for monitoring all-cause and cause-specific mortality during the Covid-19 pandemic.

A paper published in PNAS Nexus disputing common myths about America's pandemic experience garnered broad press coverage including in *The New York Times* and *The Atlantic*, among others.



Data and Misinformation in an Era of Sustainability and Climate Change Crises

The Data and Misinformation in an Era of Sustainability and Climate Change Crises FRP is led by Chris Wells (COM), Irena Vodenska (MET), and Sarah Finnie (IGS Fellow). The program seeks to understand the nature, origins, spread, impacts, and possibilities of disarming disinformation about the climate issue in an effort to address the climate crisis. This

FRP is jointly funded by the Hariri Institute and the Institute for Global Sustainability.

This year, this FRP organized a full-day research symposium on May 16 entitled "Taking on Climate Lies." The event featured a keynote address by Massachusetts Deputy Climate Chief Jonathan Schrag, six BU faculty speakers from the College of Communications, College of Engineering and Metropolitan College. The event concluded with a BU Deans Panel that discussed university leadership on climate solutions through the lens of their respective areas. The hybrid event drew 174 registrants and was covered by The Brink and other media.

Teaching Machines Human-Like Intelligence

The goal of the Teaching Machines Human-Like Intelligence FRP is to create convergence around foundational research in artificial intelligence (AI) at BU through a year-long series of intensive discussions, working groups and seminars, with the ultimate goal of coalescing around research directions for future funding.

This FRP held one workshop entitled "Bridging AI and Disability," which broadly explored directions for AI and user-driven frameworks for assistive and rehabilitative technologies. Event speakers included: Jose del R. Millan, Professor, The University of Texas at Austin; Patrick Carrington, Assistant Professor, Carnegie Mellon University; Sagib Shaikh, Software Engineering Manager and Project Lead for Seeing AI, Microsoft; and Maja Mataric, Distinguished Professor, University of Southern California. Over 80 people attended this workshop.

HARIRI INSTITUTE FOCUSED RESEARCH PROGRAM AWARDS

FY24 Focused Research Programs

Novel Data Science and AI Approaches for Brain Health and Brain Disease

Digital Health Initiative (DHI) Special Track: This FRP is led by Swathi Kiran (SAR), David Boas (ENG), Margrit Betke (CAS), and Prakash Ishwar (ENG). It brings together clinicians, neuroscientists, engineers, biostatisticians, and computer and data scientists with the objective of connecting methodologies with scientific questions related to detecting, preventing and treating brain disease. This program is cosponsored by the Hariri Institute for Computing, the School of Public Health and the Clinical & Translational Science Institute (CTSI).



First Trip to Mars: How to Pack Light

This FRP is led by Marianna Felici (CAS) and Paul Withers (CAS). Designed to support NASA's plans to land humans on Mars in the 2030s, this FRP aims to produce novel software based on data from Mars orbiters and rovers to model the ionosphere, its impact on navigation systems, and engineer microbial communities capable of carbon sequestration and nutrients production.



HARIRI INSTITUTE FELLOWS

The Institute awarded \$465,459 direct funding to faculty and doctoral students doing computational research across diverse disciplines. Six Junior Faculty Fellowships (JFFs) were awarded, bringing the community to 26 members. Seven Graduate Student Fellowships (GSFs) were awarded, bringing the community to 23 members.

2023 Graduate Student Fellows

Courtney Aul, Psychological and Brain Sciences. Aul is leveraging a background in neuroscience, psychology, and cognitive science to advance research in Parkinson's disease.

Margaret (Greta) Rauch, History. Rauch's work combines Chinese literature, religion, and technology to research the impact of belief systems on the development of literary and intellectual history.

Edward Ruiz, Genetics and Genomics. Ruiz is studying tissue and cancer biology in new ways that span multiple fields.

Jack Vincent, Biomedical Engineering. Vincent's work examines how high-level motor centers in the mammalian brain shape the output of low-level pattern generating circuits in the brainstem.

Connor Wagaman, Computer Science. Wagaman's research includes estimating network statistics and developing new algorithms and methodology for private analysis of social network data.

Yixin (Amy) Zhang, Biostatistics. Zhang is combining her background in public health and statistics with computational skills to explore social causes, such as disparities in healthcare.

Zeying Zhu, Electrical and Computer Engineering. Zhu is designing effective software-based telemetry solutions for high-volume network traffic in software network functions and microservices.



Courtney Aul
Psychological and Brain
Sciences, GRS



Margaret (Greta) Rauch
History, CAS



Edward Ruiz
Genetics and Genomics,
Chobanian and Avedesian
School of Medicine



Jack Vincent
Biomedical Engineering, ENG



Connor Wagaman
Computer Science, CAS



Yixin (Amy) Zhang
Biostatistics, CAS



Zeying Zhu
Electrical and Computer
Engineering, ENG

2023 Hariri Institute Junior Faculty Fellows

Kayhan Batmanghelich, Assistant Professor, Electrical and Computer Engineering and AIR Affiliate. Batmanghelich's work includes developing methods and addressing critical challenges of machine learning to develop trustworthy AI for the health-care domain.

Bryan Plummer, Assistant Professor, Computer Science and a core faculty member of the Artificial Intelligence Research (AIR) Initiative. Plummer's work focuses on visual recognition scene understanding, interpretable machine learning, and understanding the relationship between vision and language.

Xiaozhou Ruan, Assistant Professor, Earth and Environment. Ruan's work includes developing novel parameterizations of small-scale ocean physics into global climate models with far-reaching impli-

cations for modeling the Earth's climate system.

Chris Chao Su, Assistant Professor, Emerging Media Studies. Su's work focuses on social media analytics and political communication, with special emphasis on these dynamics in East Asia.

Preeti Sunderaraman, Assistant Professor, Neurology. Sunderaraman's research leverages cognitive and functional assessments via state-of-the-art imaging and digital technologies, and examines how technology interacts with financial decision making and financial awareness.

Adriana Tomic, Assistant Professor, Microbiology and Biomedical Engineering. Tomic's research focuses on understanding protective immune responses to viral infections and vaccines, demonstrating the potential of computational perspectives in infectious diseases research.



Kayhan Batmanghelich
Electrical and Computer
Engineering, ENG



Bryan Plummer
Computer Science, CAS



Xiaozhou Ruan
Earth and Environment, CAS



Chris Chao Su
Emerging Media Studies, COM



Preeti Sunderaraman
Neurology, Chobanian and
Avedesian School of Medicine



Adriana Tomic
Microbiology and Biomedical
Engineering, Medicine and Engineering

Hariri Institute

CENTERS AND INITIATIVES



MOC Alliance



**Software & Application
Innovation Lab (SAIL)**



**Center for
Computational
Science**



**Center for Reliable
Information Systems
and Cyber Security**



**AI Research
Initiative (AIR)**



**Red Hat
Collaboratory**



**AI and Education
Initiative**



**Center for Information
and Systems
Engineering (CISE)**



**Boston Women's
Workforce Council**



**Digital Health
Initiative**

AI AND EDUCATION INITIATIVE

The goal of the AI and Education Initiative, jointly supported by the Hariri Institute and Wheelock College of Education & Human Development, is to pursue collaborative research opportunities at the nexus of AI and education, marking the beginning of a new frontier in applications of AI research. The group expanded by almost 50%, as it now includes 38 members from 9 departments across the university.

The Initiative led a college-wide discussion of how the field of education needs to respond to the widespread availability of large language models like ChatGPT. An Op-Ed was published in BU Today entitled, “With ChatGPT’s Arrival, Should Educators Be Mourning the End of the College Essay?” Relatedly, a representative from the initiative is the Provost’s Faculty Fellow for Academic Integrity in Undergraduate Affairs and they have been working to revisit the university policy on academic integrity.

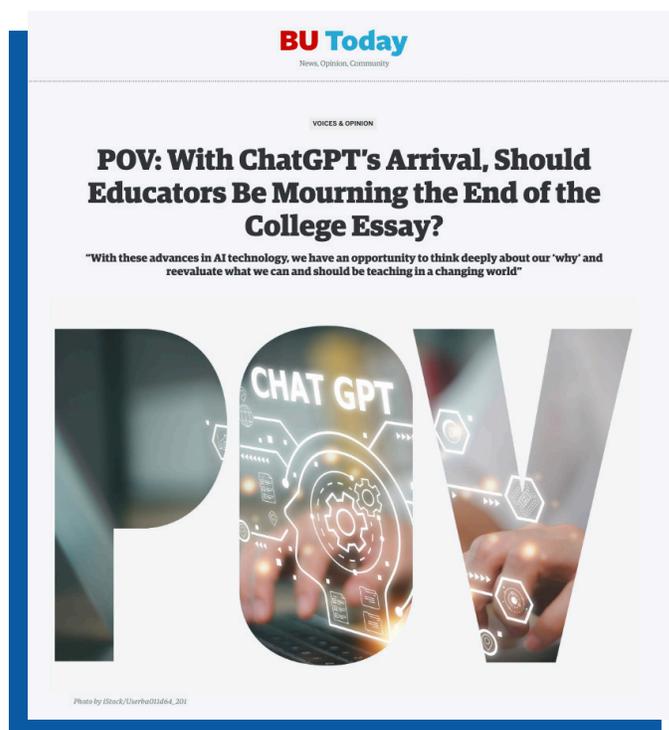
In September 2023, Boston University formed a task force to study the potential and pitfalls of generative AI (such as ChatGPT) in research and education on campus. <https://www.bu.edu/articles/2023/bu-forms-ai-task-force/>

This year, faculty members won grants from the National Science Foundation (NSF) and National Institutes of Health and are excited to continue to build their capacity and research agenda collaboratively.

Naomi Caselli, Director of the AI and Education Initiative, and Assistant Professor of Deaf Studies at the Wheelock College of Education and Human Development worked to release two large datasets of American Sign Language vocabulary.

Along with these datasets, Caselli published benchmarks for isolated sign recognition technology that enables a computer to recognize a sign in a video. These datasets improve state of the art sign recognition accuracy by more than three times. One of the datasets was developed in collaboration with the Software & Application Innovation Lab (SAIL).

In January 2023, Derry Wijaya with Professors Naomi Caselli and Christina Dobbs published the much-discussed opinion piece “POV: With ChatGPT’s Arrival, Should Educators Be Mourning the End of the College Essay?” in *BU Today*.



38 FACULTY MEMBERS
FROM THE FIELDS OF AI AND EDUCATION

PUBLISHED DATASETS

(1 with SAIL) that improve sign recognition accuracy by more than three times

ARTIFICIAL INTELLIGENCE RESEARCH INITIATIVE (AIR)

The AIR Initiative is a cross-disciplinary research initiative focused on machine intelligence. It brings together researchers whose work aims to create intelligent systems that reliably make decisions, reason about data, and communicate with humans. This year, AIR core faculty members included: Professors Margrit Betke, Brian Kulis, Bryan Plummer, Kate Saenko, Venkatesh Saligrama, Stan Sclaroff, and Derry Wijaya. Previous core member Research Professor Sarah Bargal left for a tenure-track Assistant Professor position at Georgetown University. Newly hired Computer Science Professor of the Practice Iddo Drori joined the core team during fall 2022. AIR currently has 12 affiliate members. This year, the AIR Initiative also welcomed Najoung Kim, Assistant Professor of Linguistics, and Kayhan Batmanghelich, Assistant Professor of Electrical and Computer Engineering, as new AIR affiliates.

Margrit Betke with AIR Affiliates Prakash Ishwar and Janusz Konrad collaborated with Swathi Kiran and Archana Venkataraman to develop AI models that predict a patient's responsiveness to aphasia rehabilitation using a complex set of brain and behavioral markers. Their work has resulted in several publications, including an upcoming presentation at an international workshop on Computer Vision for Automated Medical Diagnosis.

The AI and Emerging Media team, including students Yanru Jiang and Stan (Sha) Lai, Professors Prakash Ishwar, Derry Wijaya, Margrit Betke, and former AIR Affiliate Lei Guo won the 2022 Top Method Paper Award for "Community Detection of the Framing Element Network: Proposing and Assessing a New Computational Framing Analysis Approach" at the 105th Conference of the Association for Education in Journalism and Mass Communication in Detroit, MI.

Donghyun Kim, co-advised by Kate Saenko and Stan Sclaroff, and Ben Usman, advised by Kate Saenko, defended their AI PhD theses in 2022. PhD student Afra Feyza Akyürek, advised by Derry Wijaya, published on social biases in well-regarded international AI conferences on Natural Language Processing.

Four Distinguished Speaker events were held, drawing over 240 attendees. Speakers included: Serge Belongi, Visiting Professor of Computer Science at Cornell University and Head of the Danish Pioneer Centre for Artificial Intelligence at University of Copenhagen; Holly Rushmeier, John C. Malone Professor of Computer Science at Yale University; Octavia Camps, Professor of Electrical and Computer Engineering, Northeastern University; and David Jacobs, Professor, Department of Computer Science and UMIACS, University of Maryland. Weekly AIR meetings and "coffee hours" with faculty and students were also held, providing opportunities for research presentations and the sharing of ideas.

DEVELOPED AI MODELS THAT PREDICT A PATIENT'S RESPONSIVENESS TO APHASIA REHABILITATION.

COLLABORATIVE FACULTY-STUDENT PROJECT WON THE 2022 TOP METHOD PAPER AWARD.

4 DISTINGUISHED SPEAKERS FROM CORNELL UNIVERSITY, NORTHEASTERN UNIVERSITY, UNIVERSITY OF MARYLAND, AND YALE UNIVERSITY.



BOSTON WOMEN'S WORKFORCE COUNCIL (BWWC)

BWWC is a public-private partnership between the Boston Mayor's Office and Greater Boston employers dedicated to closing gender and racial wage gaps. Employers sign the 100% Talent Compact pledging to assess if their organization has wage gaps and, if so, work toward closing them with our help.

Every two years the BWWC, in partnership with the Hariri Institute, collects and analyzes payroll data anonymously from its members to show a snapshot of the progress being made to close wage gaps. In 2021, the gap was 30¢. New metrics will be available in December 2023.

In FY23, the BWWC held four quarterly briefings for its members highlighting academic experts and practitioners in the field of gender equity as it relates to pay gaps.



- Professor Frank Dobbin, Department Chair of Sociology at Harvard University, shared his findings from research with 850 different companies regarding what does and does not work in diversity training.
- Lee Pelton, President of the Boston Foundation, a long time Compact Signer, spoke about his aim to make sure equity is channeled throughout all giving by the organization.
- Sallie Krawcheck, one of the most influential women on Wall Street and the founder of Ellevest, an investment group for women, charted the ways employers can help women in their workforce stay current in their investment choices.

Our spring event was held in conjunction with the Mayor's Office of Women's Advancement (MOWA) and featured a panel discussion with Compact Signers. Community residents were invited to hear the conversation as well as participate in a resource fair regarding opportunities at our member's workplaces.



11 NEW ORGANIZATIONS SIGNED THE 100% TALENT COMPACT IN FY23 BRINGING EMPLOYEES COVERED IN THE GREATER BOSTON AREA TO APPROXIMATELY 200,000.

FOUR QUARTERLY BRIEFINGS WITH ACADEMIC EXPERTS AND PRACTITIONERS IN THE FIELD OF GENDER EQUITY AS IT RELATES TO PAY GAPS.

CCS serves as a conduit for collaborations between experimental researchers who are synthesizing and collecting real-world data and computational researchers with expertise in model building, simulation, and analysis.

This year, CSS participated in diverse research and community activities. CCS hosted five research visitors in various thematic areas, including computational biophysics, quantum science, and materials science. Each researcher presented an hour-long seminar and spent several days to a week interacting with CCS faculty affiliates and their research groups. CSS also sponsored a community symposium entitled “KeyesFest 2023 - StatMech Meets Data Science,” recognizing the contributions of Chemistry Professor Emeritus Tom Keyes to science and society. The symposium included 12 invited talks from academic and industry colleagues including NC State, Boston University, St. Joseph’s University, Broad Institute - Bioinformatics, University of Kentucky, Spectral Sciences Inc., Verisk - Atmosphere and Environment Research, GlaxoSmithKline - Clinical Bioinformatics, and Electronic Transactions Consultants.

CCS faculty were strongly engaged in the Quantum Convergence FRP, participating in bi-weekly meetings with researchers from chemistry, computer science, physics, and electrical and computer engineering, to develop a roadmap for collaborations in quantum science and engineering. CCS has committed matching funds to enable this endeavor. Additionally, CSS initiated a new community engagement initiative with the Chemical Theory and Computation Journal Club. Organized by students and postdoctoral associates, this club hosts in-depth monthly presentations on research papers of current interest to the community.

5 MULTI-DAY RESEARCH EVENTS

With experts in computational biophysics, quantum science and materials science

CSS KEYESFEST 2023

Statmech meets data sciences symposium included 12 talks from industry and academic experts

THE CENTER FOR INFORMATION AND SYSTEMS ENGINEERING (CISE)

CISE is a research center of the College of Engineering and part of the Hariri Institute's federation of centers and initiatives. Its mission is to deepen and broaden interdisciplinary research in the study and design of intelligent systems with broad societal applications. From concept and algorithms to implementation in software systems and hardware, CISE researchers engage in interdisciplinary and convergent research to advance the science and societal impact of intelligent systems. CISE research has made seminal contributions and impacted a plethora of application areas, from robotics and autonomy, energy systems, computer systems, and communication networks, to medical imaging, computational medicine, video surveillance, and bioinformatics.

With 52 faculty members, across three colleges and nine departments, and over 100 graduate students, CISE welcomes new affiliates based on their outstanding contributions in their research areas. In FY23, Mechanical Engineering Professors Tommaso Ranzani and Sheila Russo were invited to join the ranks of CISE. Talented faculty researchers and students received numerous awards such as NSF CAREER or Best Paper awards, and published over 300 scholarly papers.

CISE provides full grant administration support to help faculty achieve research goals. With 38+ proposal submissions, 60+ grant awards in conjunction with CISE and over 40 awarded CISE grants, research expenditure for FY23 resulted in \$16M. This includes prestigious Red Hat Collaboratory Research Incubation Awards received by CISE affiliates as well as a \$9 million grant for the BU Robotics and Autonomous Systems Teaching and Innovation Center (RASTIC). This grant will fund development of a state-of-the-art robotics lab and build a community of researchers and industry partners to advance hands-on student training in robotics, autonomous systems, and artificial intelligence.

To promote collaboration with external academic and industry researchers, CISE organized 27 seminars, including two cosponsored by the Hariri Institute. CISE also hosted three visiting researchers through its Resident Scholar Program. To support student development, the Center organized industry roundtables as well as the 9th annual CISE Graduate Student Workshop (CGSW), a day-long symposium where PhD students from diverse disciplines presented their original research. This year's event was attended by over 200 faculty, students and alumni.



CISE CGSW 9.0 Awards Ceremony.

CENTER FOR RELIABLE INFORMATION SYSTEMS AND CYBER SECURITY (RISCS) AND CYBER ALLIANCE

RISCS promotes and coordinates research and education in system reliability and information security.

This year, RISCS faculty advanced the state of technology in societies across the world, and influenced public policy and national regulations that govern how we use technology. RISCS faculty and students designed and developed a differentially private release of Israel's National Registry of Live Births, received a new DARPA grant to apply formal methods and cryptographic reasoning to protect computer systems, provided responses to U.S. federal government requests for information on regulating AI and advancing privacy-enhancing technologies, and prepared a Congressional Responsible AI Training Workshop for staffers at the U.S. Senate.

Many of these contributions have been inspired or discussed within the BU Security Seminar, the Seminar on Practical Security, and the Cyber Alliance Seminar; all of which continue to be sponsored by RISCS.

One of the main activities of RISCS was the Quantum Collaborative initiative, spearheaded together with Andrei Ruckenstein and others from physics, chemistry, and engineering. The Collaborative

has gained significant traction, which resulted in seed funding from Hariri Institute, and subsequent additional funding, and a hiring initiative across BU. Additional grant proposals, including a Quantum-focused NRT proposal, and research projects have merged from this initiative.

Additionally, four Charles River Crypto Day events were organized with a total attendance of over 260. Speakers included researchers from Boston University, Columbia University; Massachusetts Institute of Technology, NTT Communications, University of California, Santa Barbara; University of California, Berkeley; University of Pennsylvania; University of Texas, Austin; University of Washington; and Weizmann Institute of Science. Event cosponsors included Harvard University, Massachusetts Institute of Technology, Microsoft, and Northeastern University.

Through these seminars and other discussions, RISCS faculty have established cross-disciplinary collaborations with BU researchers in CAS, CDS, COM, ENG, LAW, MED, MET, Pardee, Wheelock, and more. Finally, we are pleased to welcome Eran Tromer as a new faculty member at BU and to the RISCS community.



Charles River Crypto Day participants.

DIGITAL HEALTH INITIATIVE (DHI)

DHI focuses on the essential role digital technologies play in the health and wellness of populations, and the integration of these technologies into people's lives and health systems. DHI projects span computing and data sciences, medical informatics, health behavior change, and healthcare delivery.

This year, a number of initiatives were organized that advance DHI goals, including funding for research programs, research talks, seminars, and a new pilot project of the Clinical & Translational Science Institute (CTSI) to support the work with TriNetX and Boston Medical Center (BMC) data to develop national excess mortality models.

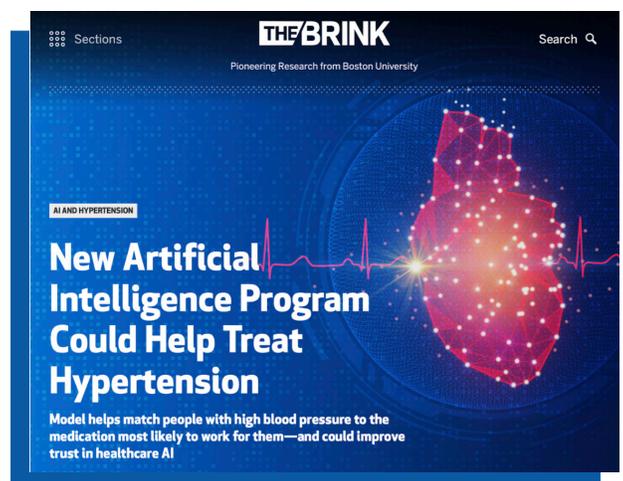
A special funding call for proposals was announced for the FY24 DHI Focused Research Program, which is co-sponsored by the Hariri Institute, CTSI, and the School of Public Health. In November, an event was organized for researchers to learn about the proposal call and featured presentations from clinical and faculty researchers from Boston Medical Center, College of Engineering, Sargent College, and the School of Public Health. In May, it was announced that DHI FRP was awarded to Professors Swathi Kiran, David Boas, Margrit Betke and Prakash Ishwar who will lead research in novel data science and AI approaches for brain health and brain disease. Digital Health was also a theme in two other awarded FY24 FRPs focused on health equity and climate change, and bio-inspired design of holistic rehabilitation systems.

The new Machine Learning in Medicine (MLX) Seminar Series was also launched, and featured 21 research talks, including three hosted at BU as Director Esteemed Seminars. Speakers included: Fei Wang of Cornell University, Dani Basset of University of Pennsylvania, and Emre Kiciman of Microsoft Research. This hybrid seminar series year is coorganized with University of Pittsburgh, University of Pittsburgh Medical Center, and University of Toronto.

In June, the Institute cosponsored the Health Data Science Distinguished Speaker event featuring Rafael Irizarry, Professor and Chair of the Department of Data Science at the Dana-Farber Cancer Institute and Professor of Biostatistics at the Harvard T.H. Chan School of Public Health. This event was held on the Boston University Medical Campus and was cosponsored with the School of Public Health Population Health Data Science Program and Department of Biostatistics.

Yannis Paschalidis also hosted a Research on Tap event entitled "Artificial Intelligence for Biomedicine and Healthcare" event, which featured talks by Institute affiliates Margrit Betke, Mark Kramer, Kayhan Batmanghelich, Vijaya B. Kolachalama, Adriana Tomic, Daniel Segrè, Ji-Xin Chen, Emma Lejeune, and Lei Tian.

Additionally, a number of papers were published funded by DHI, including a paper in Frontiers in Digital Health.



This research story was picked up by six outlets, including NSF News with quote from NSF Deputy Division Director for the Division of Information and Intelligent Systems (IIS) Wendy Nilsen.

MASS OPEN CLOUD (MOC) ALLIANCE

The Mass Open Cloud (MOC), launched in 2013, has transformed into the MOC Alliance – a partnership between higher education, government, and industry to create an open production cloud which will provide domain researchers with predictable low-cost services while enabling innovation by a broad community of academic researchers and industry collaborators. The MOC Alliance supports and coordinates a set of interrelated projects, including production cloud services supported institutionally by BU and Harvard University, a national testbed for cloud researchers, the \$20M Red Hat Collaboratory at BU, and a planned national center on cloud and datacenter-scale computing.

In March, the MOC Alliance organized its first in-person opportunity for the community to gather since the start of Covid. The two-day hybrid event featured over 70 speakers, 250 in-person attendees, hundreds of virtual attendees, including 30 companies, 10 institutions of higher education, and multiple government agencies.

Over the past year the MOC Alliance has continued to focus on enabling BU and Harvard University Research IT to offer production cloud services through the NERC (New England Research Cloud). Currently the NERC production services are used by the core MOC institutions, BU, Harvard, Northeastern, MIT and UMASS as well as Bentley, WPI, and URI. With an additional \$1.34M of funding from the Massachusetts Technology Collaborative, a Donation from AMD, and a \$3M hardware donation from Wayfair, we plan to expand the usage by other institutions and small businesses throughout the Commonwealth.



Presentations from the 2023 MOC Alliance Workshop.



Orran Kriger was a 2023 recipient of the Excellence in Technology Transfer Award from Federal Laboratory Consortium for Technology Transfer for development of Keylime, an open-source software enabling organizations to secure sensitive cloud data that has been implemented as a core security component in the Mass Open Cloud (MOC) alliance.

RED HAT COLLABORATORY

Through BU and Red Hat's \$20 million expanded partnership, announced in 2021, the Red Hat Collaboratory seeks to create more trustworthy, reliable, scalable, self-operating, distributed, heterogeneous compute platforms that stretch from edge devices to cloud datacenters.

The Red Hat Collaboratory also enables innovative partnerships between academic researchers and open source communities. Collaboration in systems research at this scale can have a profound impact on society. Projects funded through the Red Hat Collaboratory Research Incubation Award are open source and focus on problems of distributed, operating, security, or network systems whose solutions show promise for advancing their fields and impacting the tech industry. This year, the Red Hat Collaboratory awarded 19 projects to BU faculty members and industry collaborators, totaling more than \$2.1 million in funding.

The Red Hat Collaboratory funded Student Research Projects geared towards providing BU students with research and experiential learning opportunities that advance open source projects in cloud computing, systems engineering infrastructure, and security. Four undergraduates received funding for open-source projects, totaling \$31 thousand, that aim to improve the security, efficiency, and intelligence of computing systems.

This year, project recipients of the Red Hat Collaboratory 2022 and 2023 Research Incubation Awards were recognized for excellence at preeminent research conferences, including "SREP: out-of-band sync of transaction pools for large-scale blockchains," which received the Best Paper Award at the 2023 IEEE International Conference on Blockchain and Cryptocurrency (ICBC), and "CaT: coaching a teachable student," which was selected as a Highlight Paper at the 2023 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR).

In December, colleagues moved to Collaboratory space in the new Center for Computing and Data Sciences Building. A unique aspect of the space is the CoDes research lab which provides the infrastructure and engineering foundation needed to support co-design-based specialized hardware research in areas such as Automation, Scalability, Tunability and Configurability, Features, Portability and Uniformity.



BU Professor and Red Hat Collaboratory Co-Director Orran Krieger on the cover of the May issue of Red Hat Research Quarterly with Paul Cormier, Chairman of Red Hat.

SOFTWARE APPLICATION AND INNOVATION LAB (SAIL)

SAIL is the premier professional research, software engineering, and consulting lab within the Hariri Institute. SAIL acts as both a driver and a collaborative partner in the creation of cutting-edge solutions for the data-driven, computational, and software engineering aspects of research across the university and beyond. SAIL's range of services includes full-stack web and mobile application development, code base refactoring and maintenance, software best-practice consulting, project and product management guidance, and assistance with proposal and grant writing to secure extramural funding for research projects.

This year, the SAIL team welcomed nine new staff members, including seven software engineers, one technical project manager, and Associate Director of Engineering Greg Frasco, a former SAIL software engineer (2016- 2018). This new SAIL team launched over a dozen new projects with faculty members such as Hank Fien, Preeti Sunderaraman, Andrey Fradkin, Tesary Lin, Nathan Jones, Ting Fang Alvin Ang, Michael Dietze, Brian Cleary and more, while providing meaningful contributions to the research of their long-term faculty collaborators, including Naomi Caselli, Mayank Varia, David Boas, and Magrit Betke.

A major area of expansion for SAIL was in the biomedical space. SAIL was instrumental in developing the COVID testing lab at BU. Now that testing has subsided, SAIL is working with Doug Densmore and

the DAMP Lab staff to provide innovative software that will help address vital synthetic biology-related research challenges. Under the guidance of Greg Frasco, SAIL initiated implementation of microservices. SAIL also collaborated with the Boston Women's Workforce Council (BWWC) to launch the 5th Gender and Racial Wage Gap Measurement effort with the SAIL team's web-based deployment of Secure Multiparty Computation (MPC), enabling employers in Greater Boston to share aggregated payroll data anonymously with the BWWC to track progress.

SAIL was awarded a Shipley Center for Digital Learning and Innovation award to pilot the SAIL Microservices And Software Tools (MAST) program for BU students interested in developing microservices and software tools for university research. In collaboration with BU SPARK!, SAIL will provide project-based learning, enabling students to gain experience testing and deploying software, which they could leverage in coursework, senior capstones, undergraduate research, and future professional careers.

- Collaborate with **80+ FACULTY MEMBERS** Across **20+ DEPARTMENTS**.
- SAIL portion of funding from Grants **(\$2.5M)** and submitted proposals **(\$3.6M)**.
- Received over **110 applications** for software engineering internships (**7 selected**).
- 19 Active Projects**.



SAIL conducted technical, hands-on API development and Machine Learning workshops for 10 high school students served by BU's Upward Bound Math Science program.

HARIRI INSTITUTE MARKETING & COMMUNICATIONS

Best of The Brink 2022: BU's Most-Read Science and Research Stories

Five of The Brink's Top 10 most-read science and research stories of 2022 featured work or commentary from the Hariri Institute community.

Red Hat Collaboratory Featured in Red Hat Research Quarterly

The May 2023 issue of Red Hat Research Quarterly featured a cover story on how Red Hat Chairman Paul Cormier and Orran Krieger (ECE) helped spearhead a collaborative partnership between the two institutions.

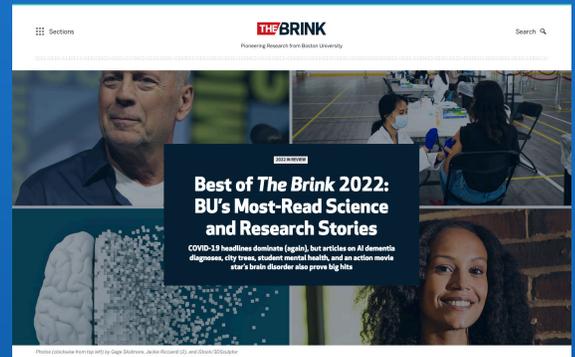
NSF News Publishes Institute Research Story

National Science Foundation published a feature article (Aug 2022) originating from the Institute-authored article, "Could a computer diagnose Alzheimer's disease and dementia?"

30 25

Science
Stories

Bylined by the
Hariri Institute



HARIRI INSTITUTE EVENTS

As the research hub within BU's universe of computing and data science programs and initiatives, the Institute organized a diverse array of events designed to facilitate connection, collaboration, and the sharing of ideas across our dynamic multidisciplinary community. Over 100 events drawing well over 5,000 attendees were organized or cosponsored.

With CISE, the Institute hosted a Director Esteemed Seminar featuring Elad Hazan, Professor of Computer Science, Princeton University who presented an emerging paradigm in differentiable reinforcement learning called "online nonstochastic control." CISE and Hariri Institute also coorganized a seminar led by Michael Milford of Queensland University of Technology spoke on Machine and Natural Learning of Spatial Intelligence in Robots and Animals.

In collaboration with the Faculty of Computing and Data Sciences, the Institute cosponsored a Tech Together Hackathon with BU Spark! on Oct 29-Oct 30.

Yannis Paschalidis organized a Research on Tap entitled "Robotics and Autonomous Systems" on Feb. 8th.

Speakers included faculty researchers from the College of Engineering and the College of Health and Rehabilitation Sciences: Sargent College, including Christos Cassandras (ECE, SE), Calin Belta (ME, ECE, SE), Roberto Tron (ME, SE), Wenchao Li (ECE, SE), Alyssa Pierson (ME, SE), Douglas Holmes (ME, MSE), Lou Award (PT), Eshed Ohn-Bar (ECE), Andrew Sabelhaus (ME), Tom Ranzani (ME, MSE, BME), Sean Andersson (ME, SE).

Graduate Student Fellows organized a Did You Know Series on April 16 with featured speaker Wayne Gilmore, Director of Research Computing Information Services & Technology, who shared how BU's Research Computing Services can assist faculty and student researchers with computational needs.

The Institute also supported Data Science Mentoring Circles events including: Assessing a Company's Financial Health (Feb 23), Salary Negotiation Workshop (March 2), and Speed Dating with Mentors (Oct 22). The Institute also led a student tour on May 10th for affiliated faculty of Wheelock College.

HARIRI INSTITUTE DISTINGUISHED SPEAKER SERIES
Co-sponsored by the Boston University School of Public Health: Population Health Data Science, and Center for Emerging Infectious Diseases (CEID)

DATA-DRIVEN APPROACHES

Mark Lurie
Associate Professor of Epidemiology, Director of the International Health Institute, Brown University

John Drake
Regents' Professor of Ecology, Director of the Center for the Ecology of Infectious Diseases, University of Georgia

Lauren Meyers
Dooley Centennial Professor, Director of the Center for Pediatric Support, University of Texas at Austin

WEDNESDAY, APR 12
11:00 AM - 12:00 PM EDT
8 St Mary's Street, Room 906, or Zoom

TUESDAY, MAY 2
11:00 AM - 12:00 PM EDT
885 Commonwealth Avenue, Room 1750, or Zoom

FRIDAY, MAY 5
11:00 AM - 12:00 PM EDT
Virtual Event
Register on Zoom

TO PREVENT THE NEXT PANDEMIC

BU Hariri Institute for Computing and Computational Science & Engineering | Center for Emerging Infectious Diseases Policy & Research | School of Public Health Population Health Data Science

AIR DISTINGUISHED SPEAKER SERIES
CROSS-VIEW ACTION RECOGNITION USING DYNAMICS-BASED INVARIANTS

Friday, February 3, 11am-12pm ET
Location: Center for Computing & Data Sciences, 685 Commonwealth Ave., Room 1750 (7th floor)
Register now on Eventbrite



Octavia Camps
Professor, Electrical and Computer Engineering, Northeastern University

BU Hariri Institute for Computing and Computational Science & Engineering

2023 MOC ALLIANCE WORKSHOP

March 20th - 21st, 2023
Location: Boston University George Sherman Union (GSU), 775 Commonwealth Ave, Boston, MA, 02258
The workshop will bring together our unique community of research IT researchers, users, and faculty to explore what has been accomplished and help define the MOC Alliance strategy moving forward
More info and registration: www.massopen.edu/2023-workshop



Featuring Keynote from Jon Stumpf
Group Head of Infrastructure at Two Sigma

BU Hariri Institute for Computing and Computational Science & Engineering

Public Health Communication in an Era of Mis- and Disinformation
September 30, 2022 | 2-3 PM ET | Hybrid

A Discussion with United Nations Under-Secretary-General for Global Communications Melissa Fleming



Supported by the Center for Emerging Infectious Diseases Policy & Research, in conjunction with the College of Communications, BU's Hariri Institute for Computing and Computational Science & Engineering, Frederick S. Parke School of Global Studies, Global Development Policy Center, and Alumni Association

Did You Know...? Series

Wayne Gilmore
Executive Director of Research Computing, Information Services & Technology

Did you know how ... IS&T Research Computing Services can assist you with your computational needs?

April 26, 3-4pm EDT
665 Commonwealth Avenue, Room 1101



BU Hariri Institute for Computing and Computational Science & Engineering

RED HAT COLLABORATORY COLLOQUIUM SERIES
CONVERSATION WITH FEDORA PROJECT LEADER MATTHEW MILLER

Thursday January 26, 12pm - 1pm ET
Location: Center for Computing & Data Sciences, 685 Commonwealth Ave., Room 1748 (6th floor)
Speaker: Matthew Miller, Distinguished Engineer at Red Hat and the leader of the Fedora Project, which creates the Fedora Linux distribution.
Lunch Provided



BU Hariri Institute for Computing and Computational Science & Engineering | Red Hat

HARIRI INSTITUTE DIRECTOR ESTEEMED SEMINAR
Co-organized with The Machine Learning in Medicine Series

Dani S. Bassett
J. Peter Skirkanich Professor
University of Pennsylvania

Understanding Brain Network Modulation

May 4, 3pm-4pm EDT
610 Commonwealth Avenue, 1st Floor, Room #01 or Zoom



BU Hariri Institute for Computing and Computational Science & Engineering

HARIRI INSTITUTE AWARDS

2023 HARIRI INSTITUTE COMMUNITY RECOGNITION AWARDS

This year, we initiated Community Recognition Awards to recognize Hariri Institute personnel whose contributions have been instrumental in helping to bring success to their team and to our organization. This program also aims to raise awareness of the important work that transpires, at all levels, within the Institute and broaden understanding of how personnel efforts help advance the Institute's mission. Award recipients were selected through voting by the community. The 2023 winners include:





Distinguished Service Award

Recipient: Stephen Brown, Director, Finance & Administration, Hariri Institute

Finalists: Emily Johnson, Assistant Director, Grants Management, Hariri Institute, and William Tomlinson, Director, Software & Application Innovation Lab (SAIL)

Student Excellence Award

Chris Cho, Senior, Computer Science; Software Engineer Intern, Software & Application Innovation Lab (SAIL)

Julie Ha, PhD Student, Computer Science; Graduate Research Assistant, Faculty Advisor: Mayank Varia

Excellence in Service Award

Tara Moran, Senior Administrative Coordinator, Mass Open Cloud – Alliance

Christina Polyzos, Associate Director, Center for Information and Systems Engineering

Innovation Award

Collin Bolles, Software Engineer, SAIL

Mayank Varia, Associate Professor, Faculty of Computing and Data Sciences

Diversity, Equity and Inclusion (DEI) Award

Katherine D'Angelo, Assistant Director, Programs and Events, Hariri Institute

Team Player Award

Daniela Demaestri, Financial Manager, Hariri Institute

FACULTY AND STUDENT AWARDS AND PROMOTIONS

Faculty Promotions

Professor

Jennifer Balakrishnan, CAS, Mathematics & Statistics

Taylor Boas, CAS, Political Science

Tereasa Brainerd, CAS, Astronomy

Theresa Ellis, Sargent, Physical Therapy

Jennifer Greif Green, Wheelock, Teaching & Learning, Special Education

Kate Saenko, CAS, Computer Science

Konstantinos Spiliopoulos, CAS, Mathematics & Statistics

Paul Withers, CAS, Astronomy

Associate Professor

Louis Awad, Sargent, Physical Therapy

Andrew Bell, CAS, Earth & Environment

Jacob Bor, SPH, Global Health

Anushya Chandran, CAS, Physics

Elaine Nsoesie, SPH, Global Health

Noora Lori, Pardee, International Relations

Gianluca Stringhini, ENG, Electrical & Computer Engineering

Roberto Tron, ENG, Mechanical Engineering

Honors & Appointments

Ayşe Coskun was named Interim Associate Dean for Research and Faculty Development (ENG).

Juliet Floyd was named the Gordon Parker Bowne Professor of Philosophy, and appointed incoming Director of the Center for the Humanities (CAS).

Tesary Lin was selected the Isabel Anderson Career Development Professor (Questrom School of Business).

Faculty Awards

Debbie Cheng was elected a Fellow of the American Statistical Association (ASA).

Lou Chitkushev was awarded a Fulbright Specialist Foreign Scholarship.

Alice Cronin-Golom received the Society of Neuroscience Bernice Grafstein Award for Outstanding Accomplishments in Promotion and Mentoring of Women in Neuroscience.

Chunanfei Dong received a Department of Energy (DOE) Early Career Research Award.

Mary Dunlop was elected a Fellow of American Institute for Medical and Biological Engineering (AIMBE).

Juliet Floyd was awarded the Fall 2022 Lecture in Criticism, October 27, 2022.

Stephen Grossberg won the 2022 PROSE Book Award in Neuroscience of the Association of American Publishers for his Magnum Opus: CONSCIOUS MIND, RESONANT BRAIN: HOW EACH BRAIN MAKES A MIND.

Orran Kriger was a 2023 recipient of the Excellence in Technology Transfer Award from Federal Lab-

oratory Consortium for Technology Transfer for development of Keylime.

Dan Li received the Timothy Oke Award from the International Association for Urban Climate for Original Research in the Field of Urban Climatology.

Renato Mancuso received a National Science Foundation (NSF) CAREER Award.

Hadi Nia received a National Science Foundation (NSF) CAREER Award.

Yannis Paschalidis was elected a Fellow of the International Federation of Automatic Control (IFAC).

Yannis Paschalidis received the 2023 College of Engineering Faculty Service Award.

Alyssa Pierson received a National Science Foundation (NSF) CAREER Award.

Alyssa Pierson received the MassRobotics Rising Star Award.

Katya Ravid was elected a Fellow of the American Heart Association (FAHA).

Lei Tian was selected a Fellow of the Scialog: Advancing Biomedicine (ABI).

Student Awards

Courtney Aul (GSF 2023), advised by Alice Cronin-Golomb, was awarded a Sigma Xi Grant in Aid of Research (GIAR) to support the project “Visual Sustained Attention Fluctuations in Parkinson’s Disease”.

Beverly Setzer (GSF 2020), advised by Laura Lewis, received the Ruth L. Kirschstein National Research Service Award (NRSA) Individual Predoctoral Fellowship (F31) from the National Institute of Health for her proposal titled “Advanced neuroimaging of arousal state transition network dynamics in the human brain.”

Hasini Weerathunge (GSF 2020), advised by Cara Stepp, received The American Speech-Language-Hearing Foundation (ASHFoundation) New Century Scholars Doctoral Scholarship. Weer-

athunge also received the 2022 Biomedical Engineering Department’s Best First-Author Paper Award by a graduate student for her work published in PLOS Computational Biology.

Rashmi Agrawal, advised by Ajay Joshi, received Second Place at the Workshop for Women in Hardware and Systems Security (WISE) 2022 for “Affordable and Practical Acceleration of CKKS-based Fully Homomorphic Encryption”.

Angela Castronuovo, advised by Gianluca Stringhini, received ECE’s best MS Project award for “Tracking the Evolution of Android Malware.”

Sadullah Canakci, advised by Ajay Joshi and Manuel Egele, received the Best Paper Award at IEEE International Symposium on Hardware Oriented Security and Trust (HOST) for PHD work and paper “ProcessorFuzz: Processor Fuzzing with Control and Status Registers Guidance.”

Max Cohen, advised by Calin Belta, received the 2023 ME Outstanding PhD Dissertation Award for his work “Online Learning-based Control of Safety-Critical Systems.”

William Krska, advised by Vivek Goyal, received the 2023 ECE Undergraduate Outstanding Research award for his IEEE ICCP paper Double Your Corners, Double Your Fun: The Doorway Camera. doi: 10.1109/ICCP54855.2022.9887738.

Sheila Seidel, advised by Vivek Goyal, received an inaugural ECE Doctoral Achievement Award 2023 for her mentorship and dissertation work “Edge-Resolved Non-line-of-sight Imaging”.

Shahabeddin Sotudian, advised by Yannis Paschalidis, received the 2023 SE Outstanding Dissertation Award for his work, “Robust Learning to Rank Models and their Biomedical Applications”.

Zihao Yuan, advised by Ayse Coskun, received the 2023 ECE Outstanding PhD Dissertation Award for work “Modeling and Optimization of Emerging On-Chip Cooling Technologies via Machine Learning.”

LOOKING AHEAD

In 2023, the Institute made important progress on advancing research convergence and integrated initiatives. The Institute will continue to advance its goal of elevating Boston University's data science and computing research to national prominence, and strengthening its position as the research hub within BU's universe of programs and initiatives that intersect with computing and computational science and engineering.

Our strategic priorities are:

1

Retain and Robustify Institute Focused Research Programs

We will seek to expand the circle of experts and research leaders from whom we obtain feedback regarding proposed programs. Working with BU in DC, we want to make FRPs more predictive than reactive, identifying areas where there are strengths at BU, emerging research leaders, and good prospects for future sponsored projects. For the first time, and as we are forming and growing an industry advisory board, we will seek input from our board on areas we should be investing.

2

Establish an Industry Advisory Board

Building on our current industry engagement through MOC-A and the Red Hat Collaboratory, we will expand our industry engagement by establishing an Industry Advisory Board. The board will identify opportunities for collaboration, provide internship and employment opportunities for our students, and guide initiation of research engagements with faculty and their research teams. Board members will also serve as ambassadors of the Institute, expanding its visibility beyond the confines of academia.

3

Strengthen and Expand Hariri Institute Services

The Institute promotes research advances and collaborations through its service function. From SAIL support to PIs, to funding and incubation support to FRPs, grant financial management, and the programs to support Junior Faculty Fellows and Graduate Student Fellows, the Institute is focused on providing goal-oriented services, programs and resources to our community. We will continue to maintain and improve the services that we provide. An area of focus is providing SAIL engineering support to junior faculty and faculty from non-STEM fields who lack resources to achieve their research goals.



LEADERSHIP

The Hariri Institute for Computing is a federation of centers, labs, and initiatives. Our leadership team consists of the Directors or Co-Directors of each federated area, plus the Institute's Director. Each of these leaders serves on the Institute's Steering Committee in an ex-officio capacity.



IOANNIS PASCHALIDIS

Director, Hariri Institute for
Computing and Computational
Science & Engineering



KATE SAENKO

**Co-Director, Artificial Intelligence
Research (AIR) Initiative**



MARGRIT BETKE

**Co-Director, Artificial Intelligence
Research (AIR) Initiative**



HUGH BROCK

Co-Director, Red Hat Collaboratory



ORRAN KRIEGER

**Co-Director, Red Hat Collaboratory
Director, MOC Alliance**



DERRY WIJAYA

Co-Director, AI and Education Initiative



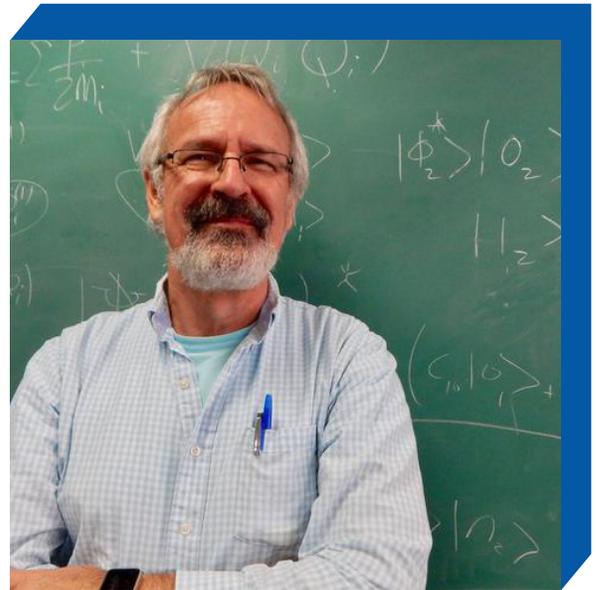
NAOMI CASELLI

Co-Director, AI and Education Initiative



AYSE COSKUN

Director, Center for Information & Systems Engineering (CISE)



DAVID COKER

Director, Center for Computational Science



WILLIAM TOMLINSON

Director, Software & Application
Innovation Lab (SAIL)



KIM BORMAN

Executive Director, Boston Women's
Workforce Council (BWWC)



RAN CANETTI

Co-Director, Center for Reliable
Information Systems & Cyber
Security (RISCS)



MAYANK VARIA

Co-Director, Center for Reliable
Information Systems & Cyber
Security (RISCS)

STEERING COMMITTEE

Members of the Institute's Steering Committee are appointed by the Office of Research to assist the Director with overall strategic planning and management of the Institute's operations. Members assist in reviewing ongoing activities, identifying and evaluating opportunities for investment of resources, developing proposals for new programs or initiatives, communicating the Institute's vision, and promoting its goals to the constituents they represent.



Bill Adams

Professor, Pediatrician, BMC,
Director, BU-CTSI



Rhoda Au

Professor, Anatomy, Neurobiology,
& Epiemiology, CAMED



Jennifer Balakrishnan

Professor, Mathematics and
Statistics, CAS



Margrit Betke

Professor, Computer Science, CAS, Faculty
of Computing & Data Sciences



Nahid Bhadelia

Associate Professor, CAMED,
Founding Director, CEID



Kim Borman

Executive Director, Boston
Women's Workforce Council



Hugh Brock

Co-Director, Red Hat Collaboratory



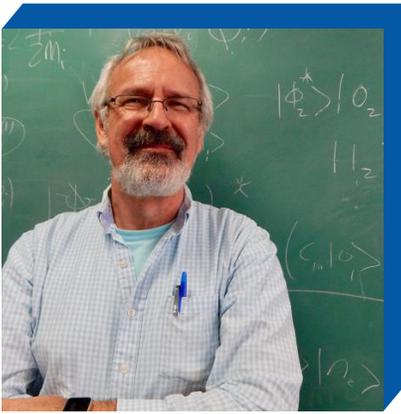
Ran Canetti

Professor, Computer Science, CAS, Faculty of Computing & Data Sciences



Naomi Caselli

Assistant Professor, Wheelock, Deaf Studies



David Coker

Professor, Chemistry, CAS, Faculty of Computing & Data Sciences



Ayse Coskun

Professor, ECE, SE, ENG, Director, CISE



Ziba Cranmer

Director, BU SPARK!



Michael Dietze

Professor, Earth and Environment, CAS



Cathie Jo Martin

Professor, Political Science, CAS



Swathi Kiran

Professor, Speech, Language, and Hearing Sciences, SAR, Faculty of Computing & Data Sciences



Orran Krieger

Professor, Electrical & Computer Engineering, ENG



Loretta Lees

Professor, CAS, Sociology; Director of the Initiative on Cities



Elaine Nsoesie

Associate Professor, Global Health, SPH



Ioannis Paschilidis

Distinguished Professor, ENG, ECE, BME, SE, Faculty of Computing & Data Sciences



Emily Ryan

Associate Professor, ME, MSE, ENG, Faculty of Computing & Data Sciences



Kate Saenko

Professor, Computer Science, CAS, Faculty of Computing & Data Sciences Science, CAS



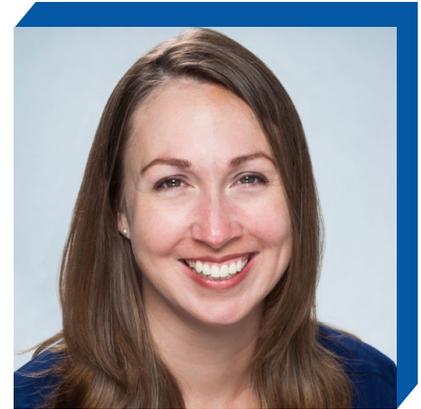
Tracy Schroeder

Vice President, Information Services & Technology



Benjamin Sovacool

Professor, Earth & Environment, CAS; Director, IGS



Cara Stepp

Professor, SLHS, Sargent College; Director, Sensorimotor Rehabilitation Engineering Lab



William Tomlinson

Director, SAIL



Mayank Varia

Associate Professor, Faculty of
Computing & Data Sciences



Laura White

Professor, Biostatistics, SPH



Derry Wijaya

Assistant Professor, Computer
Science, CAS



Wesley Wildman

Professor, Philosophy, Theology,
and Ethics, STH, Faculty of
Computing & Data Sciences

ADMINISTRATIVE TEAMS

The Hariri Institute has assembled a team of talented and dedicated professionals to help researchers make connections, identify additional support resources, and lift the burden of administrative support, so that more research is accomplished with far fewer barriers.

The Institute's administrative staff provide program and project management, grant administration, event planning, communications support, and more.



Stephen Brown

Executive Director, Hariri Institute



Katherine D'Angelo

Assistant Director, Programs & Events, Hariri Institute



Daniela Demaestri

Financial Manager, Hariri Institute



Emily Johnson

Associate Director, Research Administration, Hariri Institute



Jennifer McDonough

Senior Administrative Coordinator, Hariri Institute



Maureen Stanton

Assistant Director, Marketing & Communications, Hariri Institute



Kenneth Rudolph

Marketing Communications Specialist, Hariri Institute

CISE



Christina Polyzos

Associate Director, CISE



Amy Hayward

Grants Administrator, CISE



Lea Sabra

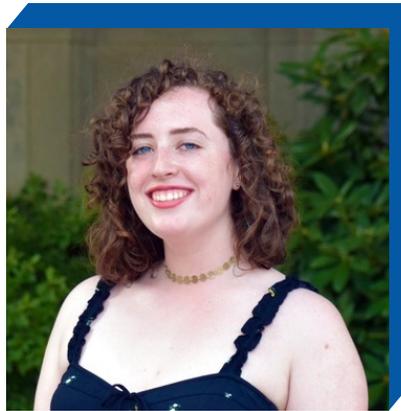
Marketing Communications
Specialist, CISE

MOC Alliance



Nancy Clinton

Managing Director, MOC Alliance



Tara Moran

Senior Administrative
Coordinator, MOC Alliance

BWWC



Lauren Noonan

Marketing and Events Manager,
Boston Women's Workforce Council

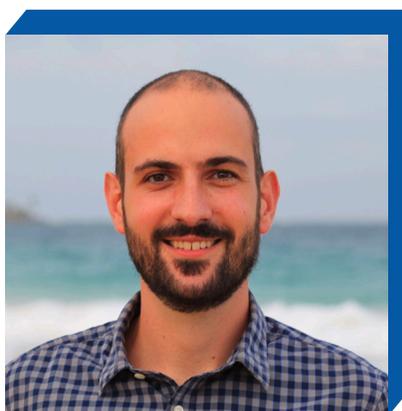
SAIL ENGINEERS

SAIL consists of a small team of professional software architects and developers who are assigned to work directly with faculty members (and their research teams) on specific software and application development projects. Additionally, these professional software engineers supervise a team of BU student interns through the SAIL Internship Program. Professional SAIL staff act as the clearing house for software developed by students, thus allowing the research community to leverage the untapped software development capacity of undergraduate and graduate students at BU, while ensuring project continuity.



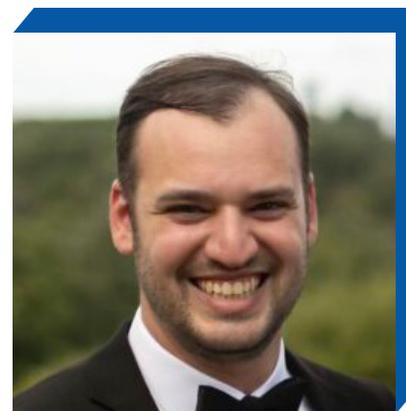
William Tomlinson

Director, SAIL



Jeff Simeon

Associate Director,
Programs & Product
Management, SAIL



Greg Frasco

Associate Director of
Engineering, SAIL



Collin Bolles

Software Engineer, SAIL



Justin Chen

Professor



Hazim Ab Halim

Software Engineer, SAIL



Manny Akosah
Software Engineer, SAIL



Zoe Chitty
Software Engineer, SAIL



Karina Hickman
Technical Project
Associate, SAIL



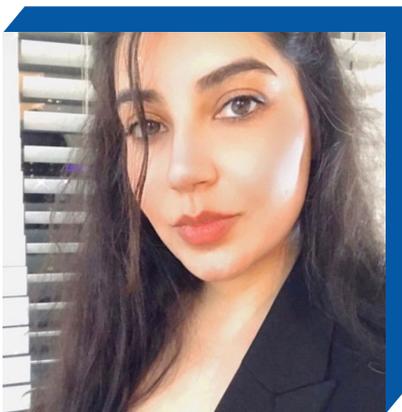
Harunobu Ishii
Software Engineer, SAIL



Shashank Karthikeyan
Software Engineer, SAIL



Asad Malik
Software Engineer, SAIL



Arezoo Sadeghi
Senior Software
Engineer, SAIL



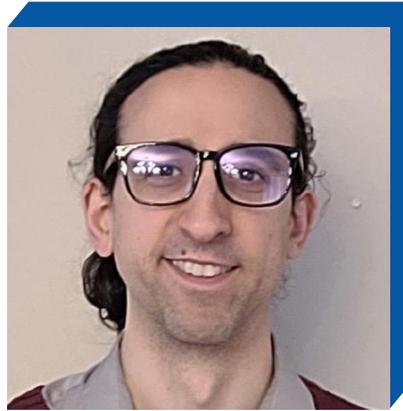
Wenhan Wang
Software Engineer, SAIL

MOC ALLIANCE TEAM



Michael Daitzman

Director of Engineering
and Product



Joachim Weyl

Technical Project Manager



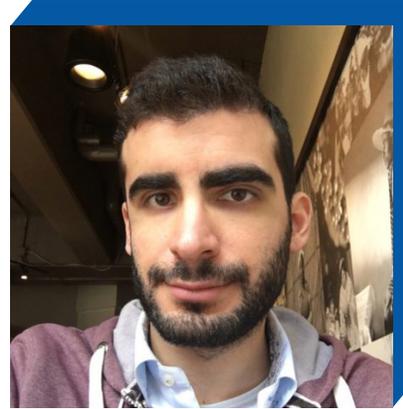
Naved Ansari

Senior Software Engineer



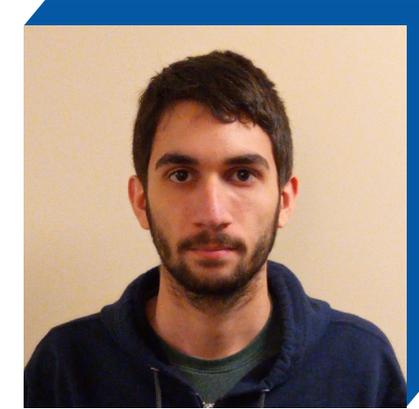
Lars Kellogg-Stedman

Senior Principal
Software Developer



Kristi Nikolla

Senior Software Engineer



Hakan Saplakoglu

Software Engineer

POSTDOCS & VISITING SCHOLARS

Postdoctoral Research Associates have recently earned a PhD from Boston University or other institutions. They are currently collaborating with faculty researchers and other PhD students on projects at the Hariri Institute.

Venkitesh Ayyar, Postdoc, Center for Computational Science

Han Dong, Postdoc, Hariri Institute

Cody Freitag, Postdoc, RISCS

Alexander Hino, Postdoc, Center for Computational Science

Marcel Neunhoeffer, Postdoc, RISCS

Visiting Scholars are scholars from other institutions spending time at the Hariri Institute in collaborative research endeavors.

Maryam Aliakbarpour, Visiting Researcher, Hariri Institute

Syedmohammadhadi Daneshmand, Visiting Researcher, Hariri Institute

Heidi Dempsey, Visiting Researcher, MOC Alliance

Peter Desnoyers, Visiting Researcher, MOC Alliance

Abishek Pratap, Visiting Researcher, Hariri Institute

Larry Woodman, Visiting Researcher, MOC Alliance

Larry Rudolph, Visiting Researcher, MOC Alliance

JUNIOR FACULTY FELLOWS

Our Junior Faculty Fellows program aims to both recognize outstanding early-career computing and data-driven researchers at Boston University and support their continued development by connecting them with one another and with the Institute community at large through various mechanisms and activities. Junior Faculty Fellows are early-career faculty researchers who are selected for a three-year appointment.

Gerdus Benade, Assistant Professor, Information Systems, QST, 2020

Andrey Fradkin, Dean's Research Scholar, Assistant Professor, Marketing, QST, 2020

Jonathan Huggins, Assistant Professor, Mathematics & Statistics, CAS, 2020

Emma Lejeune, Assistant Professor, Mechanical Engineering, ENG, 2020

Elaine Nsoesie, Assistant Professor, Global Health, SPH, 2020

Chris Wells, Associate Professor, Journalism, COM, 2020

Ana Fiszbein, Assistant Professor, Biology, CAS, 2021

Scott Hirst, Associate Professor, Law, LAW, 2021

Jihye Jeon, Assistant Professor Economics, CAS, 2021

Garrett Johnson, Assistant Professor, Marketing, QST, 2021

Laura Lewis, Assistant Professor, Biomedical Engineering, ENG, 2021

Eshed Ohn-Bar, Assistant Professor, Electrical & Computer Engineering, ENG, 2021

Prasad Patil, Assistant Professor, Biostatistics, SPH, 2021

Jonathan Jay, Assistant Professor, Community Health Science, SPH, 2022

Tesary Lin, Assistant Professor, Marketing, QST, 2022

Yuhei Miyauchi, Assistant Professor, Economics, CAS, 2022

Shariq Mohammed, Assistant Professor, Biostatistics, SPH, 2022

Max Reppen, Assistant Professor, Finance, QST, 2022

Jinglong Zhao, Assistant Professor, Operations & Technology Mgt, QST, 2022

Kayhan Batmanghelich, Assistant Professor, Electrical & Computer Engineering, ENG, 2023

Bryan Plummer, Assistant Professor, Computer Science, CAS, 2023

Xiaozhou Ruan, Assistant Professor, Earth & Environment, CAS, 2023

Chris Chao Su, Assistant Professor, Emerging Media Studies, COM, 2023

Preeti Sunderaraman, Assistant Professor, Neurology, CAMED, 2023

Adriana Tomic, Assistant Professor Biomedical Engineering and Virology, Immunology & Microbiology, ENG, 2023

GRADUATE STUDENT FELLOWS

Our Graduate Student Fellows program recognizes outstanding PhD students who are pursuing computing and data-driven research at Boston University. These fellows have a three-year appointment.

Sheng Huang, PhD Student, Astronomy, CAS, 2020

Anil Kag, PhD Student, Electrical & Computer Engineering, ENG, 2020

Yunzhe Li, PhD Student, Electrical & Computer Engineering, ENG, 2020

Beverly Setzer, PhD Student, Computational Neuroscience, CAS, 2020

Liang Wang, PhD Student, Earth and Environment, CAS, 2020

Hasini Weerathunge, PhD Student, Biomedical Engineering, ENG, 2020

Si Wu, PhD Student, Political Science, CAS, 2020

Afra Feyza Akyurek, PhD Student, Computer Science, CAS, 2021

Munib Hasnain, PhD Student, Biomedical Engineering, ENG, 2021

Chen Ling, PhD Student, Computer Engineering, ENG, 2021

Devlin Moyer, PhD Student, Interdisciplinary Programs, Bioinformatics, 2021

Adam Samuels, PhD Student, Astronomy, CAS, 2021

Adrianna Spindle-Jackson, PhD Student, Social Work, SSW, 2021

Hao Wang, PhD Student, Electrical & Computer Engineering, ENG, 2021

Jianing Wang, PhD Student, Interdisciplinary Programs, Biostatistics, 2021

Daria Dragicevic, PhD Student, Speech, Language & Hearing Sciences, Sargent, 2022

Anqi Guo, PhD Student, Electronic & Computer Engineering, ENG, 2022

Hiba Kobeissi, PhD Student, Mechanical Engineering, ENG, 2022

Chika Onubogu, PhD Student, Astronomy, CAS, 2022

Michael Silverstein, PhD Student, Interdisciplinary Programs, Bioinformatics, 2022

Olivia Wyatt, PhD Student, Counseling Psychology & Applied Human Development, Wheelock, 2022

Lingyi Xu, PhD Student, Computing & Data Sciences, CDS, 2022

Courtney Aul, PhD Student, Psychological and Brain Sciences, CAS, 2023

Margaret (Greta) Rauch, PhD Student, History, CAS, 2023

Edward Ruiz, PhD Student, Medicine, Hematology/Oncology, MED, 2023

Jack Vincent, PhD Student, Biomedical Engineering, ENG, 2023

Connor Wagaman, PhD Student, Computer Science, CAS, 2023

Yixin (Amy) Zhang, PhD Student, Biostatistics, CAS, 2023

Zeying Zhu, PhD Student, Electrical & Computer Engineering, ENG, 2023

RESEARCH FELLOWS

Faculty who are part of project teams awarded support by the Hariri Institute through one of our funding mechanisms.

Teaching Machines Human-Like Intelligence

Margrit Betke, Professor, Computer Science, CAS;
Associate Chair of the Faculty

Mark Crovella, Professor, Computer Science, CAS

Prakash Ishwar, Professor, Electrical and Computer
Engineering, ENG

Brian Kulis, Associate Professor, Electrical and
Computer Engineering, ENG

Eshed Ohn-Bar, Assistant Professor, Electrical and
Computer Engineering, ENG

Alex Olshevsky, Assistant Professor, Electrical and
Computer Engineering, ENG

Francesco Orabona, Associate Professor, Electrical
and Computer Engineering, ENG

Ioannis (Yannis) Paschalidis, Distinguished Profes-
sor, ENG, ECE, BME, SE; Director, Rafik B. Hariri Insti-
tute for Computing and Computational Science
and Engineering

Bryan Plummer, Assistant Professor, Computer
Science, CAS

Kate Saenko, Professor, Computer Science, CAS

Venkatesh Saligrama, Professor, Electrical and
Computer Engineering, ENG

Evimaria Terzi, Professor, Computer Science, CAS

Derry Wijaya, Assistant Professor, Computer
Science, CAS

Quantum Convergence

David Bishop, Professor, Electrical & Computer Engineering, ENG,

Ksenia Bravaya, Associate Professor, Chemistry, CAS

Mark Bun, Assistant Professor, Computer Science, CAS

David Campbell, Professor, Physics, CAS

Ran Canetti, Professor, Computer Science, CAS

Christos Cassandras, Distinguished Professor, Electrical and Computer Engineering, ENG

Claudio Chamon, Professor, Physics, CAS

Anushya Chandran, Associate Professor, Physics, CAS

David Coker, Professor, Chemistry, CAS

Qiang Cui, Professor, Chemistry, CAS

Linda Doerrer, Professor, Chemistry, CAS

Mark Bun, Assistant Professor, Computer Science, CAS

David Campbell, Professor, Physics, CAS

Ran Canetti, Professor, Computer Science, CAS, Faculty of Computing & Data Sciences

Steve Homer, Professor, Computer Science, CAS

Masha Kamenetska, Assistant Professor, Chemistry, CAS

Chris Laumann, Associate Professor, Physics, CAS

Siddarth Ramachandran, Distinguished Professor, Electrical and Computer Engineering, ENG

Andrei Ruckenstein, Professor, Physics, CAS

Luca Dal Negro, Professor, Electrical & Computer Engineering, ENG

Abdoulaye Ndao, Assistant Professor, Electrical & Computer Engineering, ENG

Anatoli Polkovnikov, Professor, Physics, CAS

Anders Sandvik, Professor, Physics, CAS

Alexander Sergienko, Professor, Electrical & Computer Engineering, ENG

Adam Smith, Professor, Computer Science & Engineering, CAS

John Straub, Professor, Chemistry, CAS

Alex Sushkov, Assistant Professor, Physics, CAS

RESEARCH FELLOWS

Predicting and Preventing Epidemic to Pandemic Transitions

Nahid Bhadelia, Associate Professor, Medicine, CAMED

Ronald Corley, Professor & Chair, Virology, Immunology, & Microbiology, CAMED

John Connor, Associate Professor, Virology, Immunology & Microbiology, CAMED

Michael Dietze, Professor, Earth and Environment, CAS

Jon Epstein, Vice President for Science & Outreach EcoHealth Alliance

Kevin Gallagher, Professor, Global Development Policy, Pardee, Director, Global Development Policy Center

Traci Hong, Associate Professor, Mass Communication, Advertising & Public Relations, COM

Diane Joseph-McCarthy, Executive Director, Bioengineering Technology and Entrepreneurship Center; Professor of the Practice, ENG, BME,

Gerald Keusch, Emeritus Professor, Medicine and International Health, CAMED

Eric Kolaczyk, Professor, Statistics, McGill University,

Nina Mazar, Professor, Marketing, QST

Ioannis (Yannis) Paschalidis, Distinguished Professor, ENG, ECE, BME, SE; Director, Rafik B. Hariri Institute for Computing and Computational Science and Engineering

Gianluca Stringhini, Associate Professor, Electrical and Computer Engineering, ENG

Andrew Stokes, Assistant Professor, Global Health, SPH; Sociology, CAS

Laura White, Professor, Biostatistics, SPH

Data and Misinformation in an Era of Sustainability and Climate Change Crises

Michelle Amazeen, Associate Professor, Director of Communication Research Center, Mass Communication, Advertising & Public Relations, COM

Hyunuk Kim, Assistant Professor, Administrative Sciences, MET

Arunima Krishna, Associate Professor, Mass Communication, Advertising & Public Relations, COM

Sarah Finnie Robinson, Senior Fellow, Institute for Sustainable Energy, COM

Benjamin Sovacool, Professor & Director, Earth & Environment, Institute for Global Sustainability, CAS

Gianluca Stringhini, Associate Professor, Electrical and Computer Engineering, ENG

Irena Vodenska, Professor, Finance; Director of Finance Programs, Chair of Administrative Sciences, MET

Chris Wells, Associate Professor, Emerging Media Studies, COM

RESEARCH FELLOWS

Optimal Bio-Inspired Design of Holistic Rehabilitation Systems

Lou Awad, Associate Professor,
Physical Therapy, SAR

Calin Belta, Professor & Director, Mechanical
Engineering, BU Robotics Lab, ENG

Alice Cronin-Golomb, Professor & Director,
Psychological and Brain Sciences, CAS

Terry Ellis, Associate Professor,
Physical Therapy, SAR

Elliot Lee Saltzman, Associate Professor,
Physical Therapy, SAR

Wenchao Li, Assistant Professor, Electrical and
Computer Engineering, ENG

Eshed Ohn-Bar, Assistant Professor, Electrical and
Computer Engineering, ENG

Alexander Olshevsky, Assistant Professor, Electrical
& Computer Engineering, ENG

Alyssa Pierson, Assistant Professor, Mechanical
Engineering, ENG

Andrew Sabelhaus, Assistant Professor, Mechanical
Engineering, ENG

Health Equity in the Wake of Continued Climate Change

Jonathan Buonocore, Assistant Professor,
Environmental Health, SPH

Stephanie A Ettinger de Cuba, Research Assistant
Professor, Health, Law, Policy, & Management, SPH

Patricia Fabian, Associate Professor,
Environmental Health, SPH

Mark Friedl, Professor, Earth & Environment, CAS;
Director, Center for Remote Sensing

Emma Gause, Research Scientist,
Environmental Health, SPH

Lucy Hutyra, Professor, Earth & Environment, CAS

Marcia Jimenez, Assistant Professor,
Epidemiology, SPH

Muskaan Khemani, Research Assistant,
Environmental Health, SPH

Patrick Kinney, Professor, Environmental
Health, SPH

Kevin Lane, Assistant Professor, Environmental
Health, SPH

Chad Milando, Research Scientist, Environmental
Health, SPH

Amruta Nori-Sarma, Assistant Professor,
Environmental Health, SPH

Madeleine Scammel, Associate Professor,
Environmental Health, SPH

Ian Smith, PhD, Earth & Environment, CAS

Keith Spangler, Research Scientist,
Environmental Health, SPH

Ian Sue Wing, Professor, Earth & Environment, CAS

Koen Tieskens, Postdoctoral Associate,
Environmental Health, SPH

Gregory Wellenius, Professor, Environmental
Health, SPH

RESEARCH FELLOWS

First trip to Mars: How to Pack Light

Jennifer Bhatnagar, Associate Professor, Biology, CAS

Marianna Felici, Research Scientist, Center for Space Physics, CAS

Prakash Ishwar, Professor, Electrical & Computer Engineering, ENG

Jeffrey Marlow, Assistant Professor, Biology, CAS

Majd Mayyasi, Senior Research Scientist, Center for Space Physics

Pankaj Metha, Professor, Physics, CAS

Daniel Segrè, Professor, Biology, CAS

Joshua Semeter, Professor, Electrical and Computer Engineering, ENG

Paul Withers, Professor, Department Chair, Astronomy, CAS

Novel data science and AI approaches for Brain Health and Brain Disease

Rhoda Au, Professor, Anatomy & Neurobiology, CAMED

Lou Awad, Associate Professor, Physical Therapy, SAR

Margrit Betke, Professor, Associate Chair of the Faculty, Computer Science, CAS

David Boas, Distinguished Professor, Director of Neurophotonics Center, Biomedical Engineering, and Electrical & Computer Engineering, ENG

Andrew Budson, Professor, Neurology, CAMED

Theresa Ellis, Associate Professor, Physical Therapy, SAR

Mike Esterman, Associate Professor, Psychiatry, CAMED

Alice Cronin Golomb, Professor & Director, Psychological and Brain Sciences, CAS

Prakash Ishwar, Professor, Electrical and Computer Engineering, ENG

Vijaya Kolachalama, Associate Professor, Computational Biomedicine, CAMED

Swathi Kiran, Professor, Neurorehabilitation, SAR

Janusz Konrad, Professor, Electrical & Computer Engineering, ENG

Shariq Mohammed, Assistant Professor, Biostatistics, SPH

Eshed Ohn-Bar, Assistant Professor, Electrical and Computer Engineering, ENG

Ioannis (Yannis) Paschalidis, Distinguished Professor, ENG, ECE, BME, SE; Director, Rafik B. Hariri Institute for Computing and Computational Science and Engineering

Bryan Plummer, Assistant Professor, Computer Science, CAS

Jose Rafael Romero, Associate Professor, CAMED, Neurology, Neurology, CAMED

Rob Reinhart, Associate Professor, Psychological and Brain Sciences, CAS

David Somers, Professor, Psychological and Brain Sciences, CAS

Cara Stepp, Professor & Director, Speech, Language and Hearing Sciences, STEPP LAB, SAR

Chantal Stern, Professor & Chair, Psychological and Brain Sciences, Cognitive Neuroimaging Laboratory, CAS

Yorghos Tripodis, Professor, Biostatistics, SPH

Archana Venkataraman, Associate Professor, Electrical and Computer Engineering, ENG

Derry Wijaya, Assistant Professor, Computer Science, CAS

Meryem Yucel, Research Associate Professor, Biomedical Engineering, ENG

HARIRI FACULTY AFFILIATES

William Adams, Epidemiologist, Medical Informati-
cian, Pediatrician at BMC; Director of BU-CTSI, BU

Karen Allen, Professor, CAS (CHEM, ENG, MSE);
Department Chair, CHEM; BU

Marshall Van Alstyne, Professor, QST
(Management), BU

Michelle Amazeen, Associate Professor, COM;
Director, Communication Research Center, BU

Ting Fang Alvin Ang, Research Assistant Professor,
CAMED (Anatomy & NeuroBIO), BU

Michael Anteby, Professor, QST (Management and
Organizations), BU

Jonathan Appavoo, Associate Professor,
CAS (CS), BU

Manos Athanassoulis, Assistant Professor, CAS
(CS), BU

Rhoda Au, Professor, CAMED (Anatomy, NeuroBIO
& Epidemiology), BU

Lou Award, Associate Professor, Sargent (PT), BU

Sean B. Andersson, Professor, ENG (ME), BU

Andrew Bacher-Hicks, Assistant Professor,
Wheelock (ELP), BU

John Baillieul, Distinguished Professor, ENG (ME),
BU

Jennifer Balakrishnan, Clare Booth Luce Professor,
CAS (Math/Stats), BU

Sarah Bargal, Research Assistant Professor,
CAS (CS), BU

Juan Fuxman Bass, Associate Professor,
CAS (BIO), BU

Kayhan Batmanghelich, Assistant Professor,
ENG (ECE), BU

Marianne Baxter, Professor, CAS (Economics), BU

Orkun Baycik, Clinical Associate Professor,
QST (Markets, Policy, Law), BU

Samuel Bazzi, Assistant Professor,
CAS (Economics), BU

Jennifer Beane, Associate Professor,
CAMED (MED), BU

Alexander Becker, Assistant Professor,
MET (Finance), BU

Aaron Beeler, Associate Professor, CAS (CHEM), BU

Enrico Bellotti, Professor, ENG (ECE), BU

Calin Belta, Professor & Director, ENG (ME), BU

Janine Bempechat, Clinical Professor,
Wheelock (EHD), BU

Gerdus Benade, Assistant Professor, QST (IS), BU

Gregory Benoit, Lecturer, Wheelock, Math, BU

Gary Benson, Associate Professor, CAS (BIO & CS), BU

Kimberly Bertrand, Associate Professor,
CAMED (Preventive Medicine), BU

Azer Bestavros, William Fairfield Warren Distin-
guished Professorship; Professor, CS; Associate
Provost, CDS, BU

Margrit Betke, Professor, CAS (CS); Associate Chair
of the Faculty (CS); Co-Director, Artificial Intelli-
gence Research (AIR), BU

Nahid Bhadelia, Founding Director (CEID); Infectious
Diseases Physician; Associate Professor, CAMED
(MED), BU

Jennifer Bhatnagar, Associate Professor,
CAS (BIO), BU

David Bishop, Professor, ENG (ECE, Physics, MSE,
ME, BME); Head, Division of MSE; Director, CELL-MET
Engineering Research Center, BU

Peter Blake, Associate Professor, CAS (PBS), BU

David Boas, Distinguished Professor, ENG (BME, ECE); Director, Neurophotonics Center, BU

Taylor Boas, Professor, CAS (Poli Sci), BU

Collin Bolles, Software Engineer, SAIL, BU

Jacob Bor, Associate Professor, SPH (Global Health), BU

Belinda Borrelli, Professor, SDM (Health Policy & Health Services Research); Director, Center for Behavioral Sciences Research, BU

Stephen Brady, Associate Professor, CAMED (Psychiatry), BU

Tereasa Brainerd, Professor, CAS (Astronomy), BU

Ksenia Bravaya, Associate Professor, CAS (CHEM), BU

Hugh Brock, Co-Director, Red Hat Collaboratory, BU

Richard Brower, Professor, ENG (ECE), BU

Keith Brown, Associate Professor, ENG (ME, MSE), BU

Timothy Brown, Professor, CAS (PBS), BU

Andrew Budson, Professor, CAMED (Neurology), BU

Mark Bun, Assistant Professor, CAS (CS), BU

Jonathan Buonocore, Assistant Professor, SPH (Environmental Health), BU

John Byers, Professor, CAS (CS); Senior Associate Dean of the Faculty Division of Mathematical and Computational Sciences, BU

Thomas Byrne, Associate Professor, SSW (SWP), BU

Michael Caramanis, Professor, ENG (ME), BU

Catherine Caldwell-Harris, Associate Professor, CAS (Psychology), BU

David Campbell, Professor, ENG (Physics, ECE, MSE), BU

Joshua Campbell, Assistant Professor, CAMED (Computational BioMed), BU

Ran Canetti, Professor, CAS (CS); Director of RISCS, BU

Paul Carlile, Professor, QST (IS); Senior Associate Dean, Online Learning, BU

Luis Carvalho, Associate Professor, CAS (Math & Statistics), BU

Naomi Caselli, Assistant Professor, Wheelock (Deaf Studies) & Director, AI & Education Initiative, BU

Christos Cassandras, Distinguished Professor, ENG (ECE), BU

David Castañón, Professor, ENG (ECE), BU

Claudio Chamon, Professor, CAS (Physics), BU

Anushya Chandran, Associate Professor, CAS (Physics), BU

James Chapman, Assistant Professor, ENG (ME), BU

Christine Cheng, Adjunct Assistant Professor, CAS (BIO), BU

Debbie Cheng, Professor, SPH (Biostatistics), BU

Olivia Chi, Assistant Professor, Wheelock (ELP), BU

Peter Chin, Adjunct Professor, CAS (CS), BU

Vipul Chitalia, Associate Professor, CAMED (MED), BU

Lou Chitkushev, Associate Professor, MET (CS); Director, Health Informatics & Health Sciences, BU

Dino Christenson, Associate Professor, CAS (Poli Sci); Director of Advanced Programs, BU

Brian Cleary, Assistant Professor, FCDS (Computing & Data Science), BU

Cutler Cleveland, Professor, CAS (Earth & Environment), Asc. Director, ISE, BU

David Coker, Professor, ENG (CHEM, MSE) & Director, Center for Computational Science, BU

John Connor, Associate Professor, CAMED (VIM), BU

Ronald Corley, Professor & Chair, CAMED (VIM), BU

Canan Gunes Corlu, Associate Professor, MET (SCM), BU

Paul Cormier, Chairman, Red Hat

HARIRI FACULTY AFFILIATES

Patricia Cortes, Associate Professor, QST (Markets, Public Policy, and Law), BU

Ayşe K. Coskun, Professor, ENG (ECE); CISE Director, BU

Felicity Crawford, Clinical Associate Professor, Wheelock (Special Ed), BU

Nicholas Crossland, Assistant Professor, CAMED (Pathology & Laboratory MED), BU

Mark Crovella, Professor, CAS (CS), BU

Qiang Cui, Professor, CAS (CHEM), BU

Ashok Cutkosky, Assistant Professor, ENG (ECE), BU

Julie Dahlstrom, Clinical Associate Professor, Law; Associate Dean, Experiential Education, BU

Nermeen Dashoush, Clinical Assistant Professor, Wheelock, Early Childhood Ed, BU

Joanna Davidson, Associate Professor, CAS (Anthropology), Associate Director, Kilachand Honors College

Stephanie Ettinger de Cuba, Research Assistant Professor, SPH (Health, Law, Policy, & Management), BU

Gerald Denis, Shipley Prostate Cancer Research Professor, CAMED (MED), BU

Douglas Densmore, Professor, ENG (ECE), BU

Peter Desnoyers, Associate Professor, Computer Science, Northeastern University

Leslie Dietiker, Associate Professor, Wheelock (MATH); Dean of Research, BU

Michael Dietze, Professor, CAS (E&E), BU

Linda Doerr, Professor, ENG (CHEM, MSE); Associate Director, Kilachand Honors College, BU

Stacey Dogan, Professor, Law, BU

Chuanfei Dong, Assistant Professor, CAS (Astronomy), BU

Lynn Doucette-Stamm, PI and Executive Director, DAMP Lab, BU

Iddo Drori, Associate Professor of the Practice, CAS (CS); Director of Masters in AI, BU

Manuel Egele, Associate Professor, ENG (ECE), BU

Katherine Einstein, Associate Professor, CAS (Poli Sci), BU

Theresa Ellis, Associate Professor, Sargent (PT), BU

Andrew Emili, Adjunct Professor, CAS (BIO & BIO-CHEM), BU

Karen Emmorey, Professor, Speech Lang, Lang & Cognitive Neuroscience (LLCN), BU

Alina Ene, Associate Professor & Associate Chair of Academics, CAS (CS), BU

Catherine Espaillet, Associate Professor & Director, CAS (Astronomy), BU

Mike Esterman, Associate Professor, CAMED (Psychiatry), BU

Patricia Fabian, Associate Professor, SPH (Environmental Health), BU

Sergio Fagherazzi, Professor, CAS (E&E), BU

Lindsay Farrer, Professor, SPH (Biostatistics), BU

James Feigenbaum, Assistant Professor, CAS (Economics History, Labor Economics), BU

Marianna Felici, Research Scientist, CAS, (Center for Space Physics), BU

Hank Fien, Nancy H. Roberts Professor of Educational Innovation; Director, Wheelock Institute for the Science of Education, BU

Ana Fiszbein, Assistant Professor, CAS (BIO), BU

Martin Fiszbein, Assistant Professor,
CAS (Economics), BU

Andrew Fitzpatrick, Associate Professor,
CAS (Physics), BU

Juliet Floyd, Borden Parker Bowne Professor, CAS
(Philosophy); Director, Center for the Humanities,
BU

Elena Forzani, Assistant Professor,
Wheelock (Language & Literacy), BU

Andrey Fradkin, Assistant Professor,
QST (Marketing), BU

Greg Frasco, Associate Director of Engineering,
SAIL, BU

Sarah Frederick, Associate Professor, CAS (World
Languages & Literatures), BU

Mark Friedl, Professor, CAS (E&E); Director, Center
for Remote Sensing, BU

Daniel Fulford, Associate Professor,
Sargent (OT), BU

Marco Gaboardi, Associate Professor, CAS (CS), BU

Peter Gacs, Professor Emeritus, CAS (CS), BU

Kevin Gallagher, Professor, Global Development Pol-
icy; Director, Global Development Policy Center, BU

Emma Gause, Research Scientist,
SPH (Environmental Health), BU

Michael Gevelber, Associate Professor,
ENG (ME, MSE, SE), BU

Roscoe Giles, Professor, ENG (ECE), BU

Simone Gill, Associate Professor, Sargent (OT), BU

Kira Goldner, Assistant Professor,
CAS (CS), FCDS, BU

Alice Cronin Golomb, Professor & Director,
CAS (PBS), BU

Joshua Goodman, Associate Professor, Wheelock
(Education & Economics); Program Director of
Doctoral Studies, BU

Vivek Goyal, Professor and Associate Chair of
Doctoral Programs, ENG (ECE), BU

Sheryl Grace, Associate Professor, ENG (ME), BU

Jennifer Green, Professor, Wheelock (Teaching
and Learning), BU

Jonathan Greenacre, Assistant Professor, Pardee
(International Relations), BU

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Adam Guren, Associate Professor,
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Physiology, & Biophysics), BU

Leyla Han, Assistant Professor, QST (Finance), BU

Martin Herbordt, Professor, ENG (ECE), BU

Scott Hirst, Associate Professor, Law, BU

Steve Homer, Professor, CAS (CS), BU

Traci Hong, Associate Professor, COM (MassCom,
ADPR), BU

Marc Howard, Professor, CAS (Psychology), BU

Peter Howard, Executive Director, Questrom Digital
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Jonathan Huggins, Assistant Professor,
CAS (MATH & STATS), BU

Lucy Hutyra, Professor, CAS (E&E), BU

Daryl Ireland, Research Associate Professor of
Mission & Associate; Director, Center for Global
Christianity & Mission, BU

Samuel Isaacson, Professor,
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Harunobu Ishii, Research Assistant, MET,
BU Spark!, BU

Prakash Ishwar, Professor, ENG (ECE, SE), BU

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Gabriel Kaptchuk, Research Assistant Professor,
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W. Clem Karl, Professor & Department Chair,
ENG (ECE), BU

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Simon Kasif, Professor, ENG (BME), BU

James Katz, Feld Professor, COM (EMS), BU

Lewis Kazis, Professor, SPH (Health Policy and Man-
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Thomas Kepler, Professor Emeritus,
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Gerald Keusch, Emeritus Professor, CAMED (MED and
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Thomas Keyes, Professor Emeritus, CAS, CHEM, BU

Assaf Kfoury, Professor, CAS (CS), BU

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Catherine Klapperich, Professor, ENG (BME, MSE,
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Vijaya Kolachalama, Associate Professor, CAMED
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Eric Kolaczyk, Professor of Statistics, McGill University; Adjunct Professor, BU

Mark Kon, Professor, CAS (MATH & STATS), BU

Janusz Konrad, Professor, ENG, ECE, BU

Kirill Korolev, Associate Professor, CAS, Physics, BU

P. Robert Kotiuga, Associate Professor, ENG, ECE, BU

Jessica Kramer, Assistant Professor, Sargent, OT, BU

Mark Kramer, Professor, CAS (MATH & STATS), BU

Orran Krieger, Professor, ENG (ECE); Director of MOC Alliance; Co-Director, Red Hat Collaboratory, BU

Arunima Krishna, Associate Professor, COM (MassCom & ADPR), BU

Nalin Kulatilaka, Wing Tat Lee Family Professor, QST (Management, Finance), BU

Brian Kulis, Associate Professor, ENG (ECE,) BU

Deepak Kumar, Assistant Professor, Sargent (PT), BU

Kevin Lane, Assistant Professor, SPH (Environmental Health), BU

Nelson Lau, Associate Professor, CAMED (BIO-CHEM & Cell BIO); Director of Genome Science Institute, BU

Christopher Laumann, Associate Professor, CAS (Physics), BU

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Emma Lejeune, Assistant Professor, ENG (ME), BU

Marc Lenburg, Professor, CAMED (MED), BU

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Renato Mancuso, Assistant Professor, CAS (CS), BU

Jeffrey Marlow, Assistant Professor, CAS (BIO), BU

Alan Marscher, Professor, CAS (Astronomy), BU

Cathie Jo Martin, Professor, CAS (Poli Sci), BU

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Abraham Matta, Professor & Chair, CAS (CS), BU

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Julie Palmer, Karin Grunebaum Cancer Research Professor, CAMED (Hematology & Medical Oncology), BU

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Sofya Raskhodnikova, Professor, CAS (CS), BU

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Bjoern Reinhard, Professor, CAS (CHEM), BU

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Andrei Ruckenstein, Professor, CAS (Physics), BU

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Benjamin Sovacool, Professor & Director, CAS (E&E), BU

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Jessica Stern, Research Professor, Pardee, Counter-terrorism, BU

Andrew Stokes, Assistant Professor, SPH (Global Health); CAS (Sociology), BU

Alley Stoughton, Research Professor & Visiting Fellow, CAS (CS), BU

John Straub, Professor, CAS (CHEM), BU

Gianluca Stringhini, Associate Professor, ENG (ECE), BU

Preeti Sunderaraman, Assistant Professor, CAMED (Neurology), BU

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Yorghos Tripodis, Professor, SPH (Biostatistics), BU

Roberto Tron, Associate Professor, ENG (ME, SE), BU

Paul Trunfio, Senior Research Scientist & Lecturer, CAS (Physics), BU

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Gerry Tsoukalas, Dean's Research Scholar & Associate Professor, QST (IS), BU

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Meg Tyler, Associate Director, CGS (Humanities), BU

Selim Ünlü, Distinguished Professor, ENG (ECE), BU

Sandor Vajda, Professor, ENG (BME), BU

Pirooz Vakili, Research Associate Professor,
ENG (SE), BU

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chiatry); Director, Program of Research Implemen-
tation Science, Minority Stress, and Mental Health
(PRISMM), BU

Mayank Varia, Associate Professor, FCDS, BU

Archana Venkataraman, Associate Professor, ENG
(ECE), BU

Irena Vodenska, Professor, MET (Finance); Director
of Finance Programs, Chair of Administrative
Sciences, BU

Nicholas Wagner, Assistant Professor, CAS (PBS), BU

Dylan Walker, Assistant Professor, QST (IS), BU

Michael Jay Walsh, Clinical Research Assistant,
ADRC, Memory & Aging Clinic, BU

Hua Wang, Associate Professor, ENG (ME), BU

Gregory Wellenius, Professor, SPH (Environmental
Health), BU

Chris Wells, Associate Professor, COM (EMS), BU

Claire White, Program Director, Wheelock (Child Life
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Laura White, Professor, SPH (Biostatistics), BU

Emily Whiting, Associate Professor, Director of PH.D
Admissions, CAS (CS), BU

Derry Wijaya, Assistant Professor, CAS (CS), BU

Wesley Wildman, Professor, STH (Philosophy,
Theology, & Ethics), BU

Brooke Williams, Associate Professor,
COM (Journalism), BU

Ian Sue Wing, Professor, CAS (E&E), BU

Paul Withers, Professor & Department Chair,
CAS (Astronomy), BU

Hongwei Xi, Associate Professor, CAS (CS), BU

Masanao Yajima, Associate Professor of the
Practice, CAS (MATH & STATS), BU

Rabia Tugce Yazicigil, Assistant Professor,
ENG (ECE), BU

Saul Youssef, Research Assistant Professor,
CAS (Physics), BU

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Joseph Zaia, Professor, CAMED (BIO-CHEM &
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ate Professor (QST, Marketing), BU

Chao Zhang, Assistant Professor, CAMED (Computa-
tional Biomedicine), BU

Shengzhi Zhang, Assistant Professor, MET (CS), BU

Xiaoling Zhang, Associate Professor,
CAMED (MED), BU

Xin Zhang, Professor, ENG (ME), BU

Yuting Zhang, Assistant Professor, MET (CS);
Director of Cybersecurity, BU

Jinglong Zhao, Assistant Professor, QST (OTM,) BU

Lawrence Ziegler, Professor, CAS (CHEM), BU

SELECTED GRANT HIGHLIGHTS

BU Robotics & Autonomous Systems Teaching & Innovation Center. \$4.4 million from Massachusetts Technology Collaborative and \$4.4 million in matching funds from Boston University. Led by Yannis Paschalidis. (ENG, FCDS)

Comprehensive Assessment of Speech Physiology and Acoustics in Parkinson's Disease Progression. National Institute of Health. New MultiPI award. \$3.5 Million (FY23 \$667,000). Led at BU by Cara Stepp (SAR).

Dynamics of Long Range Network Interactions in Focal Epilepsy. National Institute of Health (via Columbia University). Continuation subaward. \$502,800 (FY23 \$120,000). Led by Mark Kramer (CAS).

Effects of Input Quality on ASL Vocabulary Acquisition in Deaf Children. National Institute of Health. Supplement I continuation awards. \$670,000. Led by Naomi Caselli (Wheelock). Included extensive SAIL software development.

Neuro-Autonomy: Neuroscience-Inspired Perception, Navigation and Spatial Awareness for Autonomous Robots. Department of Defense/ONR. Increment and Supplement awards. \$2,311,000. Led by Yannis Paschalidis (ENG, FCDS).

Optimized Relations Auditing for Compliance with Laws and Ethical Statements (ORACLES). Increment Award. Department of Defense DARPA. Cooperative. Increment Award \$1,445,838. Led by Mayank Varia (RISCS, FCDS)

SATC: CORE: MEDIUM: Secure Outsourced Analytics in Untrusted Clouds. National Science Foundation. New award. \$766,000. Led by Ioannis (John) Liagouris

SATC: SMALL: CORE: Using Markets to Address Manipulated Information Online. National Science Foundation. New award. \$655,000 Led by Marshall Van Alstyne (QST).

Towards Robust and Perceptual Inclusive Mobile Robots. National Science Foundation. Foundational Research in Robotics (FRR) program. New award. \$377,000. Led by Eshed Ohn-Bar (ECE).

Red Hat Collaboratory Awards

Improving Cybersecurity Operations Using Knowledge Graphs. David Starobinski (BU), David Sastre Medina (Red Hat), Zhenpen Shi (BU), Şevval Şimşek (BU) aim to improve the workflow and performance of security operations centers, including automating several of its tasks, by leveraging the vast amount of structured and unstructured real-world data available on threats, attacks, and mitigation.

Relational Memory Controller. Manos Athanassoulis (BU), Renato Mancuso (BU), Ulrich Drepper (Red Hat), Ahmed Sanaullah (Red Hat) aim to enable the integration of the Relational Memory Engine (RME), an FPGA-based, hardware-based data transformation engine, with a memory controller.

Toward On-The-Fly Reorganization of High-Order Data Objects. Renato Mancuso (BU), Manos Athanassoulis (BU), Ulrich Drepper (Red Hat), Ahmed Sanaullah (Red Hat) will investigate the design and development of on-the-fly data reorganization engines to make the benefits of RME available to a wider set of applications, such as image manipulation, machine, learning, and tensor analysis.

HySe: Hypervisor Security Through Component-Wise Fuzzing. Manuel Egele (BU), Muzammil Hussain (BU), and Bandan Das (BU) will design, implement, and evaluate program analysis capabilities that allow the preemptive identification of bugs and vulnerabilities in hypervisor components that use interfaces identified as exposed to potential attackers.

Prototyping a Distributed, Asynchronous Workflow for Iterative Near-Term Ecological Forecasting. Michael Dietze (BU), Christopher Tate (Red Hat), Yan-

nis Paschalidis (BU), Atefeh Hosseini (BU) will prototype an accessible community infrastructure to generate ecological forecasts at scale, focusing on the development of a cloud-native workflow that can handle an asynchronous, event-driven, distributed approach to execution.

Co-Ops: Collaborative OpenShift-Based Training of Large Open-Source AI Models at Scale. Eshed Ohn-Bar (BU), Adam Smith (BU), Erik Erlandson (Red Hat), Michael Clifford (Red Hat), Lance Galletti (Red Hat), Sanjay Arora (Red Hat), Ruizhao Zhu (BU), Jimuyang Zhang (BU), Yuanming (John) Chai (BU) will develop a set of open source, Red Hat-integrated tools for efficiently and flexibility facilitating diverse and modular collaboration when training AI models for autonomous driving at scale, emphasizing privacy-preserving knowledge sharing.

Minimal Mobile Systems via Cloud-Based Adaptive Task Processing. Eshed Ohn-Bar (BU), Hee Jae Kim (BU), Lei Lai (BU), Sanjay Arora (Red Hat), Bassel Mabsout (BU) will work to build an efficient cloud-robot distributed computing platform for automatic off-loading of computationally intensive tasks to the cloud, improving performance and making low-cost, cloud-enabled robots accessible for a significantly larger set of users.

Privacy-Preserving, Automated Operational Data Sharing Telemetry Framework. Alan Liu (BU) will develop an open source automated tracing system to collect, process, and anonymize operational data, focusing on identifying and testing privacy preservation models.

Open Source Infrastructure for Secure Educational Data Management to Optimize Treatment and Identification of Students with Learning Disabilities. Hank Fien (BU), Eshed Ohn-Bar (BU), Ola Ozernov-Palchik (BU), Kasey Tenggren (BU) will develop a distributed infrastructure to process, store, analyze, and redistribute educational data that addresses privacy and security requirements for research on literacy-based disabilities.

DISL: A Dynamic Infrastructure Services Layer for Reconfigurable Hardware, Martin Herbordt (BU), Uli Drepper (Red Hat), Ahmed Sanallah (Red Hat)

Practical Programming of FPGAs with Open Source Tools, Martin Herbordt (BU), Uli Drepper (Red Hat), Ahmed Sanallah (Red Hat)

Towards High Performance and Energy Efficiency in Open-Source Stream Processing, Vasia Kalavri (BU), Jonathan Appavoo (BU), Sanjay Arora (Red Hat)

Creating a Global Secure Open-Source Research Platform to Better Understand Social Sustainability Using Data From a Real-Life Smart Village, Christos Cassandras (BU), Alexandra Machado (Red Hat), Jim Craig (Red Hat), Christopher Tate (Red Hat)

FHELib: Fully Homomorphic Encryption Hardware Library for Privacy-preserving Computing, Ajay Joshi (BU), Shaun Ghosh (BU)

Learned Cost-Models for Robust Tuning, Manos Athanassoulis (BU), Evimaria Terzi (BU)

Serverless Streaming Graph Analytics, Vasia Kalavri (BU)

Enabling Intelligent In-Network Computing for Cloud Systems, Alan Liu (BU)

Symbiotes: A New Step in Linux's Evolution, Jonathan Appavoo (BU)

Foundation in Open Source Education, Jonathan Appavoo (BU)

SELECTED SCHOLARLY WORKS

Books

Michelle Amazeen (COM) “Native Advertising in Digital News Contexts.” a book chapter for The Routledge Companion to Advertising and Promotional Culture (2nd ed.). 2023. Routledge. <https://doi.org/10.4324/9781003124870>

Calin Belta and Max Cohen (2023). Adaptive and Learning-Based Control of Safety-Critical Systems. Springer, 2023, DOI: <https://doi.org/10.1007/978-3-031-29310-8>

Calin Belta, Christos Cassandras, and Wei Xiao. “Safe Autonomy with Control Barrier Functions: Theory and Applications,” Springer, 2023, DOI: <https://doi.org/10.1007/978-3-031-27576-0>

Christos Cassandras authored two chapters of a new book entitled Control for Societal-scale Challenges: Road Map 2030, IEEE Control Systems Society Publication, 2023: <https://ieeecss.org/control-societal-scale-challenges-roadmap-2030>

Garrett Johnson, (QSTR) authored “Economic Research on Privacy Regulation: Lessons from the GDPR and Beyond,” Chapter 4 of a book in revision called “The Economics of Privacy”, University of Chicago Press.

Papers

Michelle Amazeen, Arunima Krishna, & Rob Eschmann (2022). Cutting the Bunk: Comparing the Solo and Aggregate Effects of Prebunking and Debunking Covid-19 Vaccine Misinformation. Science Communication, 44(4), 387–417. <https://doi.org/10.1177/10755470221111558>

Arunima Krishna, Michelle A. Amazeen, Narrative counters: Understanding the efficacy of narratives in combating anecdote-based vaccine misinformation, Public Relations Review, Volume 48, Issue 5, 2022, 102251, ISSN 0363-8111, <https://doi.org/10.1016/j.pubrev.2022.102251>

Michelle Amazeen, Arunima Krishna. Processing Vaccine Misinformation: Recall and Effects of Source Type on Claim Accuracy via Perceived Motivations and Credibility. International Journal of Communication, [S.I.], v. 17, p. 23, dec. 2022. ISSN 1932-8036. <https://ijoc.org/index.php/ijoc/article/view/19795/4011>

Jennifer Beane-Ebel (MED, Computational Biomedicine) and collaborators published findings related to their lung cancer research in Proceedings of the American Association for Cancer Research Annual Meeting 2023: 5433, 5632, 4651.

Emelia J. Benjamin (MED, SPH, Epidemiology) with collaborators has published a number of recent papers on cardiovascular health including in Nature Reviews Cardiology, Neurobiology of Aging, and Current Problems in Cardiology.

Adam Samuels and Tereasa G. Brainerd, “Lopsided Satellite Distributions around Isolated Host Galaxies in a Λ CDM Universe” 2023 The Astrophysical Journal 947 56. DOI 10.3847/1538-4357/acc069

Yichen Wang, Irzam Sarfraz, Rui Hong, Yusuke Koga, Vidya Akavoor, Xinyun Cao, Salam Alabdullatif, Nida Pervaiz, Syed Ali Zaib, Zhe Wang, Frederick Jansen, Masanao Yajima, W. Evan Johnson, Joshua D. Campbell. “Interactive analysis of single-cell data using flexible workflows with SCTK2.0. Cell Patterns. Accepted. doi: <https://doi.org/10.1101/2022.07.13.499900>

Anushya Chandran (CAS, PHY) with collaborators published a paper in Annual Review of Condensed Matter Physics in which they discuss the phenomenon of quantum many-body scars and quasiparticles in the energy spectrum.

Dongchen Zhang, Michael Dietze, “Towards uninterrupted canopy-trait time-series: A Bayesian radiative transfer model inversion using multi-sourced satellite observations,” Remote Sensing of Environment, Volume 287, 2023, 113475, ISSN 0034-4257, <https://doi.org/10.1016/j.rse.2023.113475>

Faisal, Muhammad; Zhang, Jerry; Liagouris, John; Vasiliki, Kalavri; Varia, Mayank.

TVA: A multi-party computation system for secure and expressive time series analytics. USENIX Security 2023. Aug 1 2023. <https://par.nsf.gov/biblio/10429492-tva-multi-party-computation-system-secure-expressive-time-series-analytics>

Juliet Floyd (2023). Steiner's Wittgenstein. In: Posy, C., Ben-Menahem, Y. (eds) *Mathematical Knowledge, Objects and Applications*. Jerusalem Studies in Philosophy and History of Science. Springer, Cham. https://doi.org/10.1007/978-3-031-21655-8_15

Juliet Floyd, "Surveyability" in Hilbert, Wittgenstein and Turing, *Philosophies* 2023, 8(1), 6; <https://doi.org/10.3390/philosophies8010006>

Farronato, C., MacKay, A., Fradkin, A. (In Press). "Self-Preferencing at Amazon: Evidence from Search Rankings", *American Economic Review* (Paper and Proceedings)

Fradkin, A., Farronato, C., Fong, J. (In Press). "Dog Eat Dog: Balancing Network Effects and Differentiation in a Digital Platform Merger", *Management Science*

Huggins JH, Miller JW. Reproducible Model Selection Using Bagged Posteriors. *Bayesian Anal.* 2023 Mar;18(1):79-104. doi: 10.1214/21-ba1301. Epub 2022 Feb 8. PMID: 36643374; PMCID: PMC9838736.

Daryl Ireland (Theology), Eugenio Menegon and Alex Mayfield. "Leaping (and Bridging) the Digital Gorge: Development, User-Experience, and the China Historical Christian Database," *Digital Humanities* 1 (2022): 123-34.

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Conference Presentations and Invited Talks

Aneesh Raman, Subhadeep Sarkar, Matthaios Olma, Manos Athanassoulis, "Indexing for Near-Sorted Data," *Proceedings of the IEEE International Conference on Data Engineering (IEEE ICDE)*, 2023, Anaheim, CA, USA, 2023, pp. 1475-1488, doi: 10.1109/ICDE55515.2023.00117.

Tarikul Islam Papon, Manos Athanassoulis, "ACE-ing the Bufferpool Management Paradigm for Modern Storage Devices," *2023 IEEE 39th International Conference on Data Engineering (ICDE)*, Anaheim, CA, USA, 2023, pp. 1326-1339, doi: 10.1109/ICDE55515.2023.00106.

Tarikul Islam Papon, Ju Hyoung Mun, Shahin Roozkhosh, Denis Hoornaert, Ahmed Sanallah, Ulrich Drepper, Renato Mancuso, Manos Athanassoulis. "Relational Fabric: Transparent Data Transformation," *2023 IEEE 39th International Conference on Data Engineering (ICDE)*, Anaheim, CA, USA, 2023, pp. 3688-3698, doi: 10.1109/ICDE55515.2023.00297.

Subhadeep Sarkar, Niv Dayan, Manos Athanassoulis. "The LSM Design Space and its Read Optimizations," *2023 IEEE 39th International Conference on Data Engineering (ICDE)*, Anaheim, CA, USA, 2023, pp. 3578-3584, doi: 10.1109/ICDE55515.2023.00273.

Dipak K Dey, Shariq Mohammed, Yuping Zhang, "Scalable Spatio-Temporal Bayesian Analysis of High-Dimensional Electroencephalography Data," *2022 Joint Statistical Meetings (JSM)*. Washington, DC. August 11, 2022.

Anqui Guo, "Software-Hardware Co-design of Heterogeneous SmartNIC System for Recommendation Models Inference and Training," *ICS '23: Proceedings of the 37th International Conference on Supercomputing June 2023*, Orlando, FL, Pages 336-347 <https://doi.org/10.1145/3577193.3593724>

Daryl Ireland, “Testing the Claim: The Sino-Foreign Protestant Enterprise and Women’s Movement,” presented at the Wesleyan Theological Society’s annual meeting, March 4, 2023.

Mohammad Hossein Hajkazemi, Vojtech Aschenbrenner, Mania Abdi, Emine Ugur Kaynar, Amin Mossayebzadeh, Orran Krieger, Peter Desnoyers. “Beating the I/O Bottleneck: a case for long-structured virtual disks. Proceedings of the Seventeenth European Conference on Computer Systems. Pages 628-643. March 28, 2022. <https://doi.org/10.1145/3492321.3524271>

Tesary Lin presented her work, “Choice Architecture, Privacy Valuations, and Selection Bias in Consumer Data”, at the NBER Conference on Data Privacy Protection and the Conduct of Applied Research. Cambridge, MA. May 4-5, 2023.

Shariq Mohammed (SPH, Biostatistics) presented “Tumor Radiogenomics with Bayesian Layered Variable Selection” at the Royal Statistical Society International Conference, Sept 13, 2022.

Coaching a Teachable Student. Jimuyang Zhang, Zanming Huang, Eshed Ohn-Bar; Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2023, pp. 7805-7815

Huang, Z., Shangguan, Z., Zhang, J., Bar, G., Boyd, M., Ohn-Bar, E. (2022). ASSISTER: Assistive Navigation via Conditional Instruction Generation. In: Avidan, S., Brostow, G., Cissé, M., Farinella, G.M., Hassner, T. (eds) Computer Vision – ECCV 2022. ECCV 2022. Lecture Notes in Computer Science, vol 13696. Springer, Cham. https://doi.org/10.1007/978-3-031-20059-5_16

Yannis Paschalidis published papers at ICASSP 2023, ICLR 2023, NeurIPS 2022, ICML 2022, which are among the top AI/ML conferences.

Yannis Paschalidis give an Invited Talk, COVID Information Commons, Columbia University, April 24, 2023 where he presented his research on Predictive Models of COVID-19 Severity and Patient Outcomes, a project was funded by NSF Predictive Intelligence for Pandemic Prevention Phase 1.

Yannis Paschalidis gave an Invited Talk, NSF Workshop on AI-Enabled Scientific Revolution, March 8, 2023, Arlington, Virginia. Co-wrote report submitted to NSF to advise on future investment in this area.

Yannis Paschalidis gave an Invited Talk to the Healthcare Information and Management Systems Society (HIMSS), March 17, 2023.

Yannis Paschalidis, Christos Cassandras, Calin Belta, Roberto Tron, Wenchao Li, Alyssa Pierson, Douglas Holmes, Lou Award, Eshed Ohn-Bar, Andrew Sabelhaus, Tom Ranzani, Sean Andersson. “Robotics and Autonomous Systems.” Research on Tap. Boston University. Feb. 8, 2023

Yannis Paschalidis, Margrit Betke, Mark Kramer, Kayhan Batmanghelich, Vijaya B. Kolachalama, Adriana Tomic, Daniel Segrè, Ji-Xin Chen, Emma Lejeune, Lei Tian. “Artificial Intelligence for Biomedicine and Healthcare.” Research on Tap. Boston University. Nov. 9, 2022

Mela Coffey and Alyssa Pierson, “Heterogeneous Coverage and Multi-Resource Allocation in Supply-Constrained Teams,” 2023 IEEE International Conference on Robotics and Automation (ICRA), London, United Kingdom, 2023, pp. 3447-3453, doi: 10.1109/ICRA48891.2023.10160414.

Jessica Stern (Pardee) delivered the 2023 Cyril Foster Lecture on ‘Nuclear Terrorism: What is the Threat?’, Oxford University’s annual distinguished lecture in the field of International Relations, May 16, 2023.

Dielle Lundberg, Andrew Stokes, Jessica Chen. Changes in Health Care Utilization Among Persons with Disabling Pain during the COVID-19 Pandemic: The Medical Expenditure Panel Survey, 2019-2020. 2023 Annual Research Meeting. AcademyHealth. June 26, 2023.

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