



Chapter of the National Academy of Inventors

NAI-NJIT Chapter Workshop
Sustainable Societies: Data Revolution
Innovations to Global Solutions for and Next Generation Cyber-infrastructure

October 27, 2022; 8.30 AM – 2.00 PM
Ballroom A/B and Gallery, Campus Center, NJIT

Abstract: Advances in computers, mobile devices, nanotechnologies and cyberinfrastructure are at the vanguard of profound transformations across society, in communications, healthcare, business and commerce, defense and even politics. Fueling this revolution are vast amounts of data and data analytics, gathered from a proliferating number of sources, that bring new information to manage almost every application around us to co-evolve in the society.

As we grow more reliant on high-performing digital infrastructure, however, it is paramount that we ensure the integrity and security of the data we're processing. From social networking to point-of-care technologies in healthcare, to, more generally, data analytics that help us manage and mitigate risks around us, peoples' lives depend on it. Data that is inaccurate, partial, or manipulated, that is viewed out of context or that fails to represent diverse populations, for example, can be more harmful than no data at all.

This National Academies of Inventors-NJIT Workshop on Sustainable Societies, the third in a series launched last year, will provide an open forum for researchers, policymakers, government regulators and business and nonprofit leaders to share their different perspectives and niche expertise on the data revolution. Among other topics, we will hear about the state of advances in data analytics, informatics infrastructure, data-fueled approaches in healthcare including cancer management along with the experiences of a serial technology entrepreneur. The Open forum will also focus on current and future trends in using data analytics, machine learning and AI in addressing complex societal and technology needs but also learn how to evolve with the trustworthy dependence on their use in our lives.

Draft Program Agenda

8.30 AM – 9.00 AM: Breakfast, Registration and Electronic PPT Poster Set-up

9.00 AM – 9.10 AM: Welcome Remarks:
Atam Dhawan, Interim Provost and Senior Executive VP, NJIT
Teik Lim, President, NJIT

- 9.10 AM – 9.40 AM: Distinguished Keynote Remarks: Innovation and Patents
Elizabeth L. Dougherty, Eastern Regional Outreach Director, Office of the Under Secretary and Director, U.S. Patent and Trademark Office
- 9.40 AM – 9.45 AM: NAI-NJIT Workshop Series on Sustainable Societies: Data Revolution; Introduction to Distinguished Keynote Speaker
Atam Dhawan, Interim Provost and Senior Executive VP, NJIT
- 9.45 AM – 10.15 AM: Distinguished Keynote Talk
Michael Doyle, PhD, Entrepreneur and Former Director for the Center for Knowledge Management at the University of California, San Francisco
- 10.15 AM – 11.15 AM: Panel Discussion
Kamalika Sandell (Chair)
David Bader, PhD, Distinguished Professor, Director Institute of Data Science, NJIT
Kunal Shah, Global Head of Enterprise Architecture at Newmark
Akshay Dhawan, Senior Director, Data Straggles, Informa
- 11.15 AM -11.20 AM Introduction to Distinguished Keynote Speaker
Atam Dhawan
- 11.20 AM – 11.50 AM: Distinguished Keynote Talk
Benjamin Shneiderman, PhD, Distinguished University Professor, Computer Science, and Founding Director: Human Computer Interaction Lab University of Maryland; NAI Fellow, NAE Member
- 11.50 AM – 12.00 PM: Closing Remarks
Atam Dhawan
- 12.00 PM – 1.00 PM: Lunch and Networking
- 1.00 PM – 2.00 PM: Data Science, AI and Research Computing Showcase
Institute of Data Science
Institute of Future Technologies
Center for AI Research
Center for Big Data
Cybersecurity Research Center
SABOC
CAMS
Big Data Lab
FinTech Lab

Biographical Sketches

Elizabeth Dougherty, JD, Eastern Regional Outreach Director, USPTO: As the Eastern Regional Outreach Director for the U.S. Patent and Trademark Office (USPTO), Elizabeth Dougherty carries out the strategic direction of the Under Secretary of Commerce for Intellectual Property and Director of the USPTO, and is responsible for leading the USPTO's East Coast stakeholder engagement. Focusing on the region and actively engaging with the community, Ms. Dougherty ensures the USPTO's initiatives and programs are tailored to the region's unique ecosystem of industries and stakeholders.

Ms. Dougherty has more than 25 years of experience working at the USPTO. She served as the Senior Advisor to the Under Secretary of Commerce for Intellectual Property and Director of the USPTO. In this role, she worked closely across the Agency's leadership to implement the policies and priorities for the USPTO. She began her career at the USPTO as a patent examiner after graduating from The Catholic University of America with a bachelor's degree in physics. While a patent examiner, Ms. Dougherty went on to obtain her J.D. from The Columbus School of Law at The Catholic University of America and served as a Senior Legal Advisor in the Office of Patent Legal Administration for a significant part of her career. Over the years, she has also served in the USPTO's Office of Petitions, the Office of Innovation Development, and the Office of Government Affairs.

Ms. Dougherty has dedicated much of her career to the USPTO's outreach and education programs focusing on small businesses, startups and entrepreneurs. In this effort she has developed, implemented, and supervised programs that support the independent inventor community, small businesses, entrepreneurs, and the intellectual property interests of colleges and universities. Similarly Ms. Dougherty has spearheaded a number of special projects with federal, state and local governments, and private organizations to promote and support invention and innovation in the United States.

Ms. Dougherty is a member of the Virginia Bar, the Giles S. Rich American Inn of Court, the Pauline Newman American Inn of Court, the American Bar Association, the Federal Circuit Bar Association, the American Intellectual Property Law Association, the Patent and Trademark Office Society, the Supervisory Patent Examiners and Classifiers Organization, Women in Science and Engineering, Federally Employed Women, and the Network of Executive Women.

Michael Doyle, PhD: Entrepreneur, scientist, and educator. Pioneer in spatial biology, cryptography, mobile AI, and Web tech. Expert in university technology transfer. Deep experience in university/industry collaborations, intellectual property strategy and management, tech industry corporate management, patent drafting and prosecution, patent enforcement and licensing, business development, & strategic planning. Dr. Michael Doyle is the creator of fundamental technologies that underlie such revolutionary products as the Cloud, blockchain/cryptocurrency systems, spatial genomics/transcriptomics, and mobile intelligent assistants. Dr. Doyle received his PhD from the Department of Cell & Structural Biogy at the University of Illinois at Urbana-Champaign (UIUC). He then served as Director of the UIC Biomecal Visualization Laboratory from 1989 to 1993. While on sabbatical at UIUC working with Dr. Paul Lauterbur (2003 Nobel Laureate) on the application of micro-MRI techniques to embryo imaging, Dr. Doyle created the Visible Embryo Project (VEP), a multi-institutional collaboration to create a national online "metacenter" computational and information resource on early human development. Prior to founding Eolas Technologies Inc. in 1994, Dr. Doyle served as Director for the Center for

Knowledge Management at the University of California, San Francisco. While at UCSF Medical Center, in 1993, Dr. Doyle led a research team that, while working on the VEP, developed the fundamental web technologies which enabled Web browsers for the first time to act as platforms for fully interactive embedded applications, in the process pioneering revolutionary Web technologies such as streaming media and cloud computing. To assist the University of California in commercializing the related patents, Dr. Doyle founded Eolas, where he is the architect of the company's research and development efforts, generating over \$250 million dollars in research revenue since 2008, including over \$50 million in patent royalties for the University of California System. His work in high-performance biological computing pioneered the important field of spatial transcriptomics in 2000. His creation of transient-key cryptography in the late 1990s represented the first signature-blockchain system, enabling the later creation of the Bitcoin system, and has been adopted in the x9.95 ANSI National Standard for secure timestamps. And his co-invention of the Skybot mobile intelligent chatbot system in 2005 pioneered the mobile intelligent-assistant product category that is now ubiquitous worldwide.

[Kamalika Sandell](#) is the Vice Provost and CIO at NJIT. Prior to joining NJIT, Kamalika was the Associate CIO at American University. Kamalika has 25+ years' experience leading initiatives with P&L responsibilities from \$20M-\$200M in global companies with ambitious targets across multiple industries – financial services, higher education, manufacturing, industrial, and retail. Kamalika has built organizations ground-up, led divisions through multiple rounds of modernization, managed distributed teams, transformed practices incorporating agile, and established a culture of learning where innovation is an operating norm. Kamalika is a member of several national and international committees and a frequent speaker on digital, analytics, and governance in organizations.

[David A. Bader, PhD](#) is a Distinguished Professor in the Department of Computer Science and founder of the Department of Data Science in the Ying Wu College of Computing and Director of the Institute for Data Science at New Jersey Institute of Technology. Prior to this, he served as founding Professor and Chair of the School of Computational Science and Engineering, College of Computing, at Georgia Institute of Technology. He is a Fellow of the IEEE, ACM, AAAS, and SIAM, and a recipient of the IEEE Sidney Fernbach Award.

[Kunal Shah](#) is an innovative thought leader with strategic leadership, management, and creative problem-solving skills, who finds untapped opportunities, and helps businesses achieve digital excellence. His passion is to understand user experience journeys, assess respective business capabilities, and create strategies that consistently drive revenue growth, reduce costs and increase operational efficiencies. Kunal is an IT leader with unwavering focus on operational & strategic IT planning, cloud adoption, and business applications rationalization. His expertise blends agile digital excellence with a unique mix of strategic vision, experience-based (CX, PX, EX) transformation techniques, combined with business-process re-engineering, enterprise architecture governance, and IT management practices.

[Akshay Dhawan](#) is Senior Director Corporate Development & Data Strategy at Informa. He is currently building one of the largest, global datasets on the market with over 400 M lives of data. He also leads data science, including delivering RWE analyses to life sciences clients. His expertise includes a broad and deep data skillset across sourcing, acquisition, financing, partnering,

regulatory / compliance, engineering, analytics, product, AI, and customer delivery. He has worked hands-on with EMR, claims, social, physiological, imaging, demographic, and other types of data. Before joining Informa, Akshay has served at Truveta - a health-system founded, mission-driven clinical data company as the Director of Business Development. He was the product owner for Clarify Launch, where he helped build a cutting-edge commercial analytics solution for Life Sciences companies. He also worked in the Data Strategy and Corp Dev group at Clarify Health Solutions, where his team pioneered one of the largest, most differentiated patient-level datasets on the market across claims, clinical, Rx, SBDoH, and other types of healthcare data. Akshay utilizes a foundation in Life Sciences, business and data strategy, and a technical background in AI.

Ben Shneiderman, PhD is a Distinguished University Professor in the Department of Computer Science, Founding Director (1983-2000) of the [Human-Computer Interaction Laboratory](#), and a member of the Institute for Advanced Computer Studies at the University of Maryland, College Park. According to Google Scholar he is the most cited faculty member at the [University of Maryland College Park](#).

He was elected as a Fellow of the Association for Computing (ACM) in 1997 and a Fellow of the American Association for the Advancement of Science (AAAS) in 2001. He received the ACM SIGCHI Lifetime Achievement Award in 2001. He is a member of the National Academy of Engineering, and a Fellow of the National Academy of Inventors in 2015. He received the [ACM SIGCHI Lifetime Achievement Award](#) in 2001 and the [IEEE Visualization Career Award in 2012](#). He was elected a member of the [National Academy of Engineering in 2010](#) in recognition of his pioneering contributions to human-computer interaction and information visualization. His contributions include the [direct manipulation concept](#), which led to clickable highlighted web-links, the ubiquitous [touchscreen keyboards](#) on mobile devices, [dynamic query sliders](#) for data exploration, and a patent for photo tagging. His work on information visualization led to the widely used [treemaps](#) ([treemap history](#), [treemap art project](#)), novel network visualizations for NodeXL, and temporal event sequence analysis for electronic health records with [EventFlow](#).