The Office of the National Coordinator for Health Information Technology
Clinical Decision Support Evidence to Action

Clinical Decision Support (CDS) Workshop

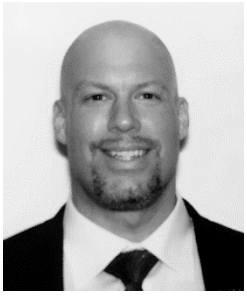
Tuesday, September 15, 2020
Virtual Meeting on Zoom

BIOSKETCHES

Katherine Andriole
Harvard Medical School and Brigham and Women's Hospital

Dr. Andriole is an Associate Professor of Radiology at Harvard Medical School, Brigham and Women's Hospital and the Director of Research Strategy and Operations at the MGH & BWH Center for Clinical Data Science (CCDS) (www.ccds.io). She studied Biomedical Engineering, and Electrical Engineering and Medicine at Duke University and Yale University, respectively, and did postdoctoral fellowships at the University of California at Los Angeles, and the University of California at San Francisco (UCSF) Departments of Radiology. At UCSF, Dr. Andriole was instrumental in designing, building and implementing picture archiving and communication systems (PACS) before they became commercial entities. Her research has involved technical as well as clinically-relevant developments in medical informatics, image analysis, business analytics, and machine learning. Dr. Andriole has developed and taught several formal courses, directed fellowships in biomedical imaging and informatics, and mentored more than 75 trainees. She has served in multiple leadership roles for the Society of Imaging Informatics in Medicine (SIIM), currently serves on the Radiological Society of North America (RSNA) Radiology Informatics Committee and the RSNA Machine Learning Steering Committee, and is the Senior Scientist for Education at the American College of Radiology (ACR) Data Science Institute. She is an Associate Editor of the *Journal of Medical Imaging* and *Radiology: Artificial Intelligence*. Dr. Andriole has been elected a member of the Academy of Harvard Medical School, inducted into the College of SIIM Fellows, and named Third and Second Vice President of the RSNA for 2015 and 2018 respectively. She has received the RSNA Honored Educator Award and the inaugural RADxx Trailblazer Award recognizing a pioneering woman leader in Imaging Informatics.

Matthew Burton, MD
Vice President of Clinical Informatics, Apervita, Inc.



Dr. Burton is the Vice President of Clinical Informatics for Apervita, Inc. an industry leading analytics Platform-as-a-Service and computable knowledge marketplace. He leads the applied clinical informatics, data science, and knowledge engineering efforts with emphasis on exchange of shareable analytics (knowledge assets, AI/ML services) and value-added insights for clinical best practices, learning health systems, and value-based care.

His areas of expertise include Applied Clinical Informatics- including clinical workflow analysis, cognitive support interventions, clinician UX design, and Knowledge Engineering- knowledge architecture and representation, knowledge lifecycle methods and tooling supporting acquisition to delivery, and Health Systems Engineering. He has taught graduate level courses in Clinical Workflow and Knowledge Engineering and mentored numerous graduate students, post-docs, and physician trainees at the Regenstrief Institute, Purdue University, Mayo Clinic, and Arizona State University.

Dr. Burton served as an Assistant Professor of Biomedical Informatics at Mayo Clinic and the Lead Clinical Informatician for the Applied Clinical Informatics Program where he has lead projects in advanced analytics, cognitive support, workflow optimization, practice redesign, and knowledge-driven systems. He lead a major Practice Redesign effort using a Learning Health System approach to Clinical Pathways, Clinical Registries, and Practice Analytics. Other projects under his direction include Knowledge-Enriched Data, as well as concurrent capture and analysis endeavors for Source System Semantics and Clinical Workflow prior to a major pre-EHR implementation.

Dr Burton is a former recipient of NLM Postdoctoral Fellowship in Medical Informatics at the Regenstrief Institute, Inc. He completed a General Surgery internship at SUNY Buffalo and received an M.D. from the University of Michigan. He has training and extensive experience in Industrial Engineering prior to his medical and informatics training and he has served as a Product Manager at several successful Health IT start-ups. His research interests are in systems engineering-based approaches to clinical information and knowledge management tool and process redesign. Most of his activities lie at the boundary of biomedical informatics and industrial/systems engineering and leverage a transdisciplinary approach to Joint Cognitive Systems- that is human and machine collaboration in the knowledge lifecycle (acquisition through delivery) to provide cognitive support that is contextually integrated into optimized clinical workflows. He has developed and refined a broadly used mixed-methods framework for Clinical Workflow Capture, Analysis, and Modeling that co-addresses physical, cognitive, and informational tasks. A recognition of the vital and multifaceted role of knowledge (expert and computable) including its manifestation and use in data and information tools (e.g., application logic), and the lifecycle of knowledge across the spectrum of clinical work is central to his portfolio of initiatives. He advocates for the necessity of clinical information and knowledge management tools that afford significant 'cognitive and computational advantage' within the knowledge-intensive work of biomedicine much as physical machinery has afforded mechanical advantage for physical labor.

Dexter Canoy
University of Oxford

Dr. Canoy is an epidemiologist at the Nuffield Department of Women's and Reproductive Health, University of Oxford. His research interests include using large biomedical data as discovery tools for identifying determinants of population health and understanding chronic disease aetiology. He is involved in the Deep Medicine research programme, which combines expertise in medicine, epidemiology, and machine intelligence to generate new insights to complex disease patterns, risk trajectories and treatment effects. His work into women's vascular health explores long-term health trajectories of women with hypertensive pregnancies using linked electronic health records. He is also an investigator within the Blood Pressure Lowering Treatment Trialists' Collaboration, which is currently the largest individual patient-level randomized data resource to date.

He has a degree in medicine (University of the Philippines) and a doctorate in epidemiology (University of Cambridge). He was previously involved in several large prospective cohort studies (EPIC-Norfolk, Northern Finland Birth Cohort Studies, the Million Women Study) to examine determinants of major causes of morbidity and mortality in the population.

Dr. Canoy is Fellow at Oxford Martin School and serves as an Associate Editor of the Cardiovascular Epidemiology and Prevention section of the *Frontiers in Cardiovascular Medicine* journal.

Daniel Chaput
Office of the National Coordinator

Mr. Chaput is an IT Specialist at the Office of the National Coordinator for Health Information Technology (Health and Human Services) in Washington, DC. He has dual training background and experience in public health and information technology. Having worked at the State and Local Health Departments for several years, he also brings in a unique perspective to multiple projects and initiatives at the ONC. In addition to his work on standards implementation and testing in ONC he works collaboratively with the Centers for Disease Control and Prevention (CDC), the Centers for Medicare and Medicaid Services (CMS), State and local Public Health Departments, Healthcare Providers, Vendors, and Health IT developers to overcome implementation challenges with interoperable health systems.

His background includes IT management and architecture in financial institutions, manufacturing, software, and consulting companies. As a public health informatician he has addressed public health business problems utilizing an IT toolkit including statistics, system and software design, and database management in addition to his management experience. His public health assignments and projects have been at, and across jurisdictional levels including local, state, national, and international levels.

Roland Gamache, PhD, MBA, FAMIA
Agency for Healthcare Research and Quality

Dr. Gamache is a Staff Fellow for the Division of Digital Healthcare Research in the Center for Evidence and Practice Improvement at the Agency for Healthcare Research and Quality. His areas of focus include the effective use of information technology that suggest interventions to improve health outcomes and to enhance operational processes and tools that improve the utilization of health data. Before joining AHRQ, Dr. Gamache worked as a researcher and educator at the Regenstrief Institute at Indiana University where he worked on projects that bridged public health and clinical care standards-based data sharing utilizing health information exchanges. Additionally, he focused on workforce development issues through teaching health informatics courses and developing competency centered course materials. Prior to his university work, he led a number of teams at a state health agency on projects in public health preparedness, automation and quality improvement of data collection for public health registries, syndromic surveillance programs, and the calculation and dissemination of state health statistics.

Andrew Gettinger
The Office of the National Coordinator for Health Information Technology

Dr. Gettinger serves as chief clinical officer The Office of the National Coordinator for Health Information Technology. He is a professor of anesthesiology emeritus at Geisel School of Medicine at Dartmouth, and was formerly the chief medical information officer (CMIO) for Dartmouth-Hitchcock and associate dean for clinical informatics at Geisel.

Dr. Gettinger has extensive experience in the field of health information technology. He led the development of an electronic health record (EHR) system at Dartmouth and subsequently was the senior physician leader during Dartmouth's transition to a vendor-based EHR. Dr. Gettinger's clinical practice and research has been focused both on anesthesiology and critical care medicine, and on information technology as it applies generally to health care.

Dr. Gettinger founded the clinical informatics group at Dartmouth. He has been an active participant in the policy debates regarding patient privacy at both the state and federal level, testifying before the senate HELP committee and participating as a member of the New Hampshire legislative taskforce on privacy. He served in Senator Orrin G. Hatch's office as a Robert Wood Johnson health policy fellow.

He is board certified in anesthesiology, critical care medicine and was among the inaugural cohort of physicians certified in clinical informatics by the American Board of Preventive Medicine in 2013.

John D. Halamka, MD, MS
Mayo Clinic Platform

Dr. Halamka is president of the Mayo Clinic Platform, leads a portfolio of platform businesses focused on transforming health care by leveraging artificial intelligence, connected health care devices and a network of trusted partners.

Trained in emergency medicine and medical informatics, Dr. Halamka has been developing and implementing health care information strategy and policy for more than 25 years.

Prior to his appointment at Mayo Clinic, Dr. Halamka was executive director of the Health Technology Exploration Center for Beth Israel Lahey Health in Massachusetts, where he oversaw digital health relationships with industry, academia and government worldwide. He had previously served as chief information officer at Beth Israel Deaconess Medical Center for more than 20 years. He is a practicing
emergency medicine physician.

As the International Healthcare Innovation Professor at Harvard Medical School, Dr. Halamka helped the George W. Bush administration, the Obama administration and governments around the world plan their health care information strategies.

Dr. Halamka completed his undergraduate studies at Stanford University, earned his medical degree at the University of California, San Francisco, and pursued graduate work in bioengineering at the University of California, Berkeley. He completed his residency at Harbor — UCLA Medical Center in the Department of Emergency Medicine.

Dr. Halamka has written a dozen books about technology-related issues, hundreds of articles and thousands of posts on the Geekdoctor blog. He also runs Unity Farm in Sherborn, Massachusetts, which includes 250 animals, 30 acres of agricultural production, a cidery and winery.

Kensaku Kawamoto, MD, PhD, MHS, FACMI
University of Utah

Dr. Kawamoto is Associate Chief Medical Information Officer of University of Utah Health and Vice Chair of Clinical Informatics in the University of Utah Department of Biomedical Informatics. At the University of Utah, Dr. Kawamoto leads the ReImagine EHR initiative, which is a multi-stakeholder effort to enable standards-based, interoperable applications and software services to improve health and health care. For his work on ReImagine EHR, Dr. Kawamoto was recognized by *Modern Healthcare* in 2019 as a Top 25 Innovator. Beyond the University of Utah, Dr. Kawamoto serves on the Board of Directors of Health Level 7 International (HL7), the primary standards development organization in health IT. Dr. Kawamoto is also a member of the U.S. Health IT Advisory Committee, which is the primary federal advisory body on health IT.

Thomas Mason, MD
The Office of the National Coordinator for Health Information Technology

Dr. Mason is Chief Medical Officer (CMO) of the Office of The National Coordinator for Health Information Technology (ONC) at the U.S. Department of Health and Human Services (HHS). As CMO he is a health IT and stakeholder ambassador for ONC, routinely meeting with clinicians in the field and advocates across the healthcare industry, focusing on improving health IT usability, reducing clinician burden, and advancing ONC's mission to improve data use and its availability across the health care spectrum. Working closely with staff at the Centers for Medicare & Medicaid and other agencies within HHS, Dr. Mason leads efforts to better understand and address clinical documentation burdens and other administrative burdens relating to the use of electronic health records. Dr. Mason led the development of ONC's Health IT Playbook, which offers tools, resources, and best practices to help address the challenges of implementing, adopting and optimizing health IT.

Prior to joining ONC, Dr. Mason worked at the Cook County Health and Hospitals System (CCHHS), the third largest public hospital system in the country. He spent 14 years as a board-certified internist with an emphasis on primary care and preventative medicine and led the charge to implement EHRs across the system. His work at CCHHS allowed specialists and primary care providers to streamline and optimize EHR use, improving clinical workflow and system efficiency. Dr. Mason has brought his experience implementing multiple EHRs to ONC to help the agency better understand the difficulties clinicians experience with health IT and to help facilitate collaboration between the government and the healthcare industry to improve clinicians' and patients' engagement with innovative health technologies.

Dr. Mason earned his M.D. degree from the University of Illinois College of Medicine and completed his residency in Internal Medicine at Rush University Medical Center and Cook County Hospital.

Maria Michaels, MBA, PMP
Centers for Disease Control and Prevention

Ms. Michaels is a Public Health Advisor at CDC, bringing health IT, health care, and research perspectives. She has served as Technical Lead/Program Manager for HITECH Clinical Quality Measure Policy and Operations at CMS and as Program Manager at NCI's Cancer Human Biobank as well as with the health systems of Virginia Commonwealth University, where she directed Meaningful Use, and the Johns Hopkins University, where she developed and managed a large research program. She holds a B.S. degree in biology and B.S. degree in psychology from Virginia Commonwealth University, M.B.A. degree from Johns Hopkins University, and a PMP from the Project Management Institute.

Kristen Miller, DrPH, CPPS
MedStar Health

Dr. Miller is the Scientific Director of the National Center for Human Factors in Healthcare at MedStar Health, Associate Professor of Emergency Medicine at Georgetown University School of Medicine and Affiliate Faculty at Georgetown Innovation Center for Biomedical Informatics. Dr. Miller is a clinically oriented human factors researcher focusing on medical decision making, informatics, and the assessment of medical interventions with an emphasis on usability, human error, and patient safety. Her portfolio includes federally funded work from the National Institutes of Health, Agency for Healthcare Research and Quality, Office of the National Coordinator for Health Information Technology, Centers for Disease Control and Prevention, National Science Foundation, and the Society to Improve Diagnosis in Medicine. Her experience spans three public health degrees, a post-doctorate with the Department of Veterans Affairs National Center for Patient Safety, and experience with multiple healthcare systems including the Veterans Health Administration, Johns Hopkins, and Christiana Care Health System. Kristen is an influential promoter of programs that further the career of early career research scientists and female professionals in research and public health. Her research interests also include an evaluation of the ethical, legal, and policy implications of health information technology and digital health tools. She is currently a Master of Science in Law student at the University of Maryland Francis King Carey School of Law.

Sarah Preum, PhD
Carnegie Mellon University

Dr. Preum is a postdoctoral fellow at Carnegie Mellon University's (CMU) Human-Computer Interaction Institute. She will be joining the CS department at Dartmouth College as a tenure-track assistant professor in July 2021. At CMU, she works with Professor John Zimmerman to provide data-driven clinical decision support using AI in the Intensive Care Unit. Sarah has developed novel natural language processing, knowledge integration, and temporal modeling techniques to provide personalized decision support for health safety. Some of her research projects include (1) multi-modal conflict detection and prediction for assistive health applications, (2) identifying unsafe health information, and (3) developing wearable intelligent assistant to provide real-time decision support to emergency responders. She has received her Ph.D. in CS from the University of Virginia.

Bryn Rhodes
Dynamic Content Group

Mr. Rhodes is a key contributor and Subject Matter Expert in the Clinical Quality Framework Initiative, primarily involved with the development and support of the Clinical Quality Language Specification. His expertise in Clinical Decision Support stems from implementation experience building a real-time Clinical Decision Support system for an industry leading Electronic Health Records system.

With 20 years in software development, he has a broad range of implementation experience, from desktop client/server line-of-business and medical applications to enterprise and web-scale information systems. His career has focused on the

expression and implementation of logic systems, from simple printer-command and build automation interpreters, through full-scale database query compilers and 4GL interface engines. This focus brings a unique and important perspective to bear on the problem of accurate and automatable sharing of clinical quality logic as expressed in knowledge artifacts for Clinical Decision Support and Clinical Quality Measurement.

Joshua Richardson, PhD, MS, MLIS
RTI International

Dr. Richardson is a research health IT scientist in RTI International's Chicago office with more than 10 years of experience in health IT–enabled health care evaluations. His research interests are primarily centered on technology's impact on clinical care, particularly in primary care settings. His other interests include using implementation science and informatics methods to investigate the effects that electronic health records (EHRs) and mobile health technologies have on managing opioid medications, and technology-focused needs assessments for practices that undergo practice transformations such as patient-centered medical homes. He is currently Project Director for the Agency for Healthcare Research and Quality (AHRQ)-funded effort, Clinical Decision Support for Chronic Pain Management (CDS4CPM), which is a 2-year effort to develop, implement, and evaluate patient- and provider-facing CDS that promotes shared-decision making. He is also currently a project member of the National Cancer Institute's IMPACT project and works with leading cancer centers to evaluate their implementations of informatics solutions to improve cancer symptom management. Previously, Dr. Richardson was assistant director for The Patient-Centered Clinical Decision Support Learning Network that promoted the use of CDS to deliver patient-centered evidence to clinicians and patients and co-chaired the Trust Framework Work Group whose efforts informed the policies for CDS Connect and continue to inform the efforts around trust and policy within the Mobilizing Computable Biomedical Knowledge community. Prior to his work at RTI International, Dr. Richardson was an Assistant Professor as well as Assistant Library Director for Clinical Services at Weill Cornell Medicine.

Don Rucker, MD
Office of the National Coordinator

Dr. Don Rucker serves as the national coordinator for health information technology. He previously worked as a clinical professor of emergency medicine and biomedical informatics at the Ohio State University and Premise Health, a worksite clinic provider, where he served as chief medical officer.

Dr. Rucker started his informatics career at Datamedic Corporation where he co-developed the world's first Microsoft Windows based electronic medical record. He then served as chief medical officer at Siemens Healthcare USA. Dr. Rucker led the team that designed the computerized provider order entry workflow that, as installed at Cincinnati Children's Hospital, won the 2003 HIMSS Nicholas Davies Award for the best hospital computer system in the U.S. Dr. Rucker has served on the board of commissioners of the Certification Commission for Healthcare Information Technology and Medicare's Evidence Development and Coverage Advisory Committee (MEDCAC) and has extensive policy experience representing healthcare innovations before Congress, MedPAC and HHS.

He has practiced emergency medicine for a variety of organizations including at Kaiser in California; at Beth Israel Deaconess Medical Center in Boston, where he was the first full-time emergency department attending; at the University of Pennsylvania's Penn Presbyterian and Pennsylvania Hospitals; and most recently at Ohio State University's Wexner Medical Center.

Dr. Rucker is a graduate of Harvard College and the University of Pennsylvania School of Medicine with board certifications in emergency medicine, internal medicine and clinical informatics. He holds a Master's degree in medical computer science and a Master of Business Administration, both from Stanford.

Wesley Sargent, EdD, MA
Centers for Disease Control and Prevention

Dr. Sargent serves as a Health Scientist for the Clinical Practice Team in the Division of Overdose Prevention (DOP) at the Centers for Disease Control and Prevention (CDC). His work at CDC has been focused on translating and implementing CDC's Guideline for Prescribing Opioids for Chronic Pain and serving as a Science Officer on the National Center for Injury Prevention and Control's Overdose Data to Action (OD2A) cooperative agreement.

Dr. Sargent currently works with health care systems on the implementation and use of the CDC Guideline through the integration of prescription drug monitoring program (PDMP) data into electronic health records (EHRs), quality improvement measures, and electronic clinical decision support (CDS) tools. As a Science Officer, Dr. Sargent provides scientific and technical assistance to states and health care systems.

Dr. Sargent earned and his undergraduate degree from the University of Georgia and his graduate degrees from the University of West Georgia. He is also a licensed professional counselor (LPC) in the state of Georgia.

Mark Sendak, MD, MPP
Duke Institute for Health Innovation

Dr. Sendak is the Population Health & Data Science Lead at the Duke Institute for Health Innovation (DIHI), where he leads interdisciplinary teams of data scientists, clinicians, and machine learning experts to build technologies that solve real clinical problems. He has built tools to support Duke Health's Accountable Care Organization, COVID-19 Pandemic Response Network, and hospital network. Together with his team, he has integrated dozens of data-driven technologies into clinical operations and is a co-inventor of software to scale machine learning applications. He leads the DIHI Clinical Research & Innovation scholarship, which equips medical students with the business and data science skills required to lead health care innovation efforts. His work has been published in technical venues such as the *Machine Learning for Healthcare Proceedings* and *Fairness, Accountability, and Transparency in Machine Learning Proceedings* and clinical journals such as *Plos Medicine, Nature Medicine* and *JAMA Open*. He has served as an expert advisor to the American Medical Association, AARP, and National Academies of Medicine on matters related to machine learning, innovation, and policy. He obtained his Bachelor's of Science in Mathematics from UCLA.

Ronald M. Summers, MD, PhD
National Institutes of Health

Dr. Summers is a tenured Senior Investigator and Staff Radiologist in the Radiology and Imaging Sciences Department at the NIH Clinical Center in Bethesda, MD. He is a Fellow of the Society of Abdominal Radiologists and of the American Institute for Medical and Biological Engineering. His awards include the Presidential Early Career Award for Scientists and Engineers, the NIH Director's Award, and the NIH Clinical Center Director's Award. He is a member of the editorial boards of the *Journal of Medical Imaging, Radiology: Artificial Intelligence* and *Academic Radiology* and a past member of the editorial board of *Radiology*. He was Co-Chair of the 2018 and 2019 SPIE Medical Imaging conferences and Program Co-Chair of the 2018 IEEE ISBI symposium. He has co-authored over 500 journal, review and conference proceedings articles and is a co-inventor on 14 patents.

James E. Tcheng, MD
Duke University

Dr. Tcheng is a Professor of Medicine and a Professor of Informatics at Duke University. He is a practicing interventional cardiologist and faculty of the Duke Clinical Research Institute and the Duke Center for Health Informatics. He serves as Director of the Duke Cardiovascular Databank, Director of Performance Improvement of the Duke Heart Center, and CMIO of the Duke Heart Network. His work focuses on the clinical, technical, and operational informatics of cardiovascular clinical data to facilitate the capture and interoperability of data that advances the assessment of clinical care delivery and accomplishes quality and performance improvement.

Michael Waters, PhD
U.S. Food and Drug Administration

Dr. Waters is currently detailed to the HHS COVID-19 Data Strategy and Executions Workgroup (DSEW) helping provide innovative data solutions combat the pandemic. He is also is the team lead for the multi-agency/stakeholder *Systemic Harmonization and Interoperability Enhancement for Laboratory Data (SHIELD)* effort and the Real-World Evidence Tactical Team representative for the Office of In Vitro Diagnostics and Radiological Health (OIR) in the Center for Devices and Radiological Health (CDRH), at FDA. He also serves as interdisciplinary scientific reviewer for a wide range of medical devices, with a focus on diagnostics, instrumentation and software. He leads efforts to build laboratory data (e.g., IVD) infrastructure for a National Evaluation System for healthcare Technology (NEST). He also serves as the OIR representative for the Medical Device Innovation Consortium (MDIC) Outcome Analytics working group. Dr. Waters also participates in several data interoperability working groups, focused primarily on implementing SHIELD infrastructure to improve the interoperability of laboratory data. Prior to working at FDA, he worked as postdoctoral research associate at the National Institute of Standards and Technology (NIST) and was a Research Fellow for the National Research Council (NRC). Dr. Waters holds a Ph.D. in molecular biology from the University of Southern California Department of

Molecular and Computational Biology and has over 20 years of experience in microbiology and molecular biology."

Greg White, MS, MA
Security Risk Solutions

Mr. White serves as a program analyst at Security Risk Solutions, Inc. In this capacity, facilitates and coordinates the technical development and piloting activities for the CDS for CDC Prescribing Guideline project. He also provides support to other Health IT projects, such as the ONC and CMS electronic Long Term Services and Support initiative. He has a background in software engineering and cybersecurity, has a master's degree in computer science, and is an active member of HL7.

Qian Yang
Cornell University

Ms. Yang is an assistant professor at Cornell University. As a human-AI interaction researcher, her work focuses on fostering effective clinician-AI teamwork in the context of day-to-day healthcare practice. Her team has previously designed a decision support system that improved pathologist-AI teams' diagnostic accuracy by up to 30%, without changing the AI algorithm itself. Her team has also successfully embedded AI into multidisciplinary cardiology teams' surgical candidate selection practices.

John Zimmerman
Carnegie Mellon

Mr. Zimmerman is the Tang Family Professor of AI and HCI at Carnegie Mellon's School of Computer Science. He has been designing interfaces for people to interact with AI systems for more than 20 years. His research touches on many aspects of human-AI interaction including how to situate AI systems so people experience them as valuable and meaningful, how user experience designers can more effectively engage with AI as a design material, and work on social interaction with robots and personal agents who often function as proxy people. This work goes across many domains including healthcare, education, retail, and domestic environments. He teaches courses on interaction design, service design, lean startup, and on the design of AI products and services.