Digital Health and Wellness

May 21, 2024 11:00 am - 1:00 pm
Rebekah Miller joined the Office of Corporate Relations team as a Program Director in March 2022. Rebekah brings to the OCR expertise in the life sciences and chemical industries as well as in applications including sensors, consumer electronics, semiconductors and renewable energy.

Prior to joining the OCR, Rebekah worked for over a decade at Merck KGaA, most recently as a Global Key Account Manager in the Semiconductor division. Rebekah also served as Head of Business and Technology Development for the Semiconductor Specialty Accounts, during which time she led strategic planning and technology roadmapping.

While at Merck KGaA, Miller established a strong track record in industry-university partnerships, corporate entrepreneurship, and innovation management, with experience in roles spanning Technology Scouting, Alliance Management, and New Business Development. Early in her career, she led early phase R&D projects as a member of the Boston Concept Lab, which focused on technology transfer from academia.

Miller earned her B.A. in Chemistry and Biology from Swarthmore College and her Ph.D. in Chemistry, with a Designated Emphasis in Nanoscale Science and Engineering, from the University of California, Berkeley. She first joined MIT as a postdoctoral associate in the Bioengineering and Material Science Departments.

Miki Kato joined the MIT Industrial Liaison Program as a Program Director in October 2021. Mr. Kato has over 20 years of experience in new business development, including various activities with MIT.

Prior to joining the ILP, Kato worked at FUJIFILM Corporation for 40 years in various new business development sectors. He was President of FUJIFILM Pharmaceuticals U.S.A., Inc., conducting the clinical trials of FUJIFILM pipeline drugs and leading the joint research project in drug delivery with MIT’s Koch Institute. During his tenure, he also collaborated with the Department of Electrical Engineering at MIT for digital camera’s CMOS image sensors and the Department of Materials Sciences and Engineering for high-speed photodetectors.

Kato has presented at several conferences at the Cambridge Innovation Center, including the 2018 Japan Innovation Forum with the Consulate General of Japan and the 60th- anniversary Kyoto-Boston sister city celebration Life Science Forum (2019) with the City of Boston, the Japan Society of Boston, and the Consulate General of Japan.

He holds an M.E. in Polymer Chemistry from Kyoto University and an M.S. in Management of Technology from MIT.
Continuous imaging of internal organs over days could provide unprecedented information about one's health and diseases and shed new insights into developmental biology. However, this is unattainable with existing wearable devices. Here, we report a bioadhesive ultrasound (BAUS) device, which consists of a thin and rigid ultrasound probe robustly adhered to the skin via a soft, tough, anti-dehydrating, and bioadhesive couplant. The BAUS device provides 48-hour continuous and simultaneous imaging of multiple organs including blood vessels, muscle, heart, gastrointestinal tract, diaphragm, and lung for the first time. The BAUS device could enable diagnostic and monitoring tools for various diseases, including hyper/hypotension, neuromuscular disorders, cardiac diseases, digestive diseases, and COVID-19. The long-term time-series imaging data of multi-organ correlations could provide a new system-level insight into human physiology. I will conclude the talk by proposing two challenges in science, technology, and medicine:

- Can we continuously image the full human body over days to months?
- Can we make ultrasound imaging an affordable wearable commodity for global health?
Wearable Technologies for Sensing, Communicating, and Modeling Human Emotion

Rosalind Picard

Professor of Media Arts and Sciences, MIT Media Lab
Director, Affective Computing Research, MIT Media Lab
Faculty Chair, MIT Mind+Hand+Heart
Co-founder, Empatica, Inc.
Co-founder, Affectiva, Inc.

Professor Rosalind W. Picard, Sc.D. is founder and director of the Advancing Wellbeing Initiative. She has co-founded two businesses, Empatica, Inc., creating wearable sensors and analytics to improve health, and Affectiva, Inc., delivering technology to help measure and communicate emotion.

Picard holds a bachelor's degree in electrical engineering with highest honors from the Georgia Institute of Technology, and master's and doctorate degrees, both in electrical engineering and computer science, from MIT. She started her career as a member of the technical staff at AT&T Bell Laboratories designing VLSI chips and algorithms for digital signal processing and compression. In 1991 she joined the MIT Media Lab faculty. She is the author of the book Affective Computing, which became instrumental in starting a new field by that name. Today that field has its own journal, international conference, and professional society. Picard was also a founding member of the IEEE Technical Committee on Wearable Information Systems in 1998, helping launch the field of wearable computing.

Picard has authored or co-authored over two hundred scientific articles and chapters. She is a recipient of several best paper prizes, including work on machine learning with multiple models (with Minka). One of her "best papers (with Healey), measuring stress in Boston drivers, was recognized as "best paper of the decade 2000-2009" for IEEE Intelligent Transportation Systems.

Picard is an active inventor with multiple patents, including wearable and non-contact sensors, algorithms, and systems for sensing, recognizing, and responding respectfully to human affective information. In 2005 she was named a Fellow of the IEEE for contributions to image and video analysis and affective computing. Picard has been honored with dozens of distinguished and named lectureships and other international awards. She has given over 100 invited keynote talks.??

Picard has served on numerous international and national science and engineering committees, boards, and panels, including the Advisory Committee for the National Science Foundation’s (NSF’s) division of Computers in Science and Engineering (CISE), the National Institute of Health (NIH)'s National Advisory Mental Health Council, and the IEEE Ethics Initiative Affective Computing Committee.??

Picard interacts regularly with industry and has consulted for companies including Apple, AT&T, BT, HP, i.Robot, Merck, Motorola, and Samsung. Her group's achievements have been featured in forums for the general public such as The New York Times, The London Independent, National Public Radio, Scientific American Frontiers, ABC's Nightline and World News Tonight, Time, Vogue, Wired, Voice of America Radio, New Scientist, and BBC programs such as "Hard Talk" and "Horizon with Michael Mosley."

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Development of an EEG Neurobiomarker Platform for Neurological and Psychiatric Disease

Jacob Donoghue
CEO & Co-Founder
Beacon Biosignals
Dynocardia, Inc. is developing an innovative wearable device for continuous, accurate monitoring of blood pressure and heart function, with applications across healthcare markets.
Panel Discussion: The Commercialization of Wearables
Rebekah Miller
Program Director, MIT Industrial Liaison Program

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1:00 PM  Closing Remarks and Adjournment