

Ubiquitous Active Surfaces

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Friday, February 26, 2021

Abstract: Paper-thin devices can turn everyday surfaces into light emitters, solar collectors, mechanical sensors, audio and ultra-sound speakers, augmenting the utility of present environments and opening pathways for new portable and large-scale technologies. Proliferation of such active surfaces necessitates a paradigm shift in device design and an introduction of new fabrication processes. Through examples, the talk will show that with recent advancements in the use of molecular, polymeric and quantum dot thin films, both the paper-thin device technology and the scalable fabrication processes are on the horizon, ushering scalable proliferation of ubiquitous active surfaces.

Bio: Dr. Vladimir Bulović is a Professor of Electrical Engineering at the Massachusetts Institute of Technology, holding the Fariborz Maseeh Chair in Emerging Technology. He directs the Organic and Nanostructured Electronics Laboratory, co-leads the MIT-Eni Solar Frontiers Center, leads the Tata GridEdge program, and is the Founding Director of MIT.nano, MIT's new nano-fabrication, nano-characterization, and prototyping facility. He is an author of over 250 research articles (cited over 50,000 times and recognized as the top 1% of the most highly cited in the Web of Science). He is an inventor of over 120 U.S. patents in areas of light emitting diodes, lasers, photovoltaics, photodetectors, chemical sensors, programmable memories, and micro-electro machines, majority of which have been licensed and utilized by both start-up and multinational companies. The three start-up companies Bulović co-founded jointly employ over 350 people, and include Ubiquitous Energy, Inc., developing nanostructured solar technologies, Kateeva, Inc., focused on development of printed electronics, and QD Vision, Inc. (acquired in 2016) that produced quantum dot optoelectronic components. Products of these companies have been used by millions. Bulović was the first Associate Dean for Innovation of the School of Engineering and the Inaugural co-Director of MIT's Innovation Initiative, which he co-led from 2013 to 2018. For his passion for teaching Bulović has been recognized with the MacVicar Fellowship, MIT's highest teaching honor. He completed his Electrical Engineering B.S.E. and Ph.D. degrees at Princeton University.