

2023 Lanning Distinguished Lecture

Smart Healthcare

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Thursday, August 31, 2023

1:00 p.m. – Lecture ETRL 101

2:00 p.m. – Reception ETRL 119

Light Refreshments Provided

BIOGRAPHY

Niraj K. Jha received his B.Tech. degree in Electronics and Electrical Communication Engineering from Indian Institute of Technology, Kharagpur, India in 1981 and Ph.D. degree in Electrical Engineering from University of Illinois at Urbana-Champaign in 1985. He is a Professor of Electrical and Computer Engineering at Princeton University. He has served as an Associate Director for the Princeton Andlinger Center for Energy and the Environment. He is a Fellow of IEEE and ACM. He was given a Distinguished Alumnus Award by I.I.T., Kharagpur in 2014. He has co-authored five books among which are two textbooks that are being widely used around the world. He has served as the Editor-in-Chief of IEEE Transactions on VLSI Systems and on the editorial boards of several other IEEE Transactions. He is an author or co-author of more than 470 papers among which are 15 award-winning papers. His research interests include algorithms and architectures for machine learning, with applications to smart healthcare.



ABSTRACT

The Internet-of-Things (IoT) era promises hundreds of billions of devices or physical objects connected to the Internet. These objects include sensors, actuators, and processing elements that help us gather data, make intelligent decisions, and optimize processes. IoT is expected to have a potential economic impact of \$3-6 trillion per year by 2025, with \$1-2.5 trillion of this economic impact (its largest fraction) coming from smart healthcare applications. These healthcare applications will be enabled by various technologies, e.g., (i) neural network based detection and differential diagnosis using wearable medical sensors present in smartwatches and smartphones that will communicate with a health server to enable a physician to keep track of an individual's health and (ii) personalized medical decision-making. However, many challenges remain in making this vision a reality. In this talk, we will explore how machine learning models employed at different layers of the healthcare hierarchy can begin to realize the above vision.



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