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The Possibility of Cognitive Automation in Medicine.

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Abstract: The Healthcare industry in the United States is under digital transformation to address several macroeconomic and socioeconomic challenges including high costs and low quality, increase in federal regulations and policies, better expectation on patient experience, health inequities, hospital consolidation, and so on. Other developed and developing countries are facing similar healthcare transformation issues with different extents. Healthcare waste alone constitutes 25-30% or about \$1 trillion of the healthcare spending in the United States. To increase efficiency and accessibility, artificial intelligence (AI) has recently been used in automating business, administrative, and operational processes in eliminating mundane, repetitive tasks performed by humans. But can we use AI to address the remaining tasks that involve large amounts of data and require human cognitive capabilities to perform non-routine tasks and enhance human decision-making performance?

In this discussion, we will present a use case on investigating and applying cognitive automation in stroke detection and diagnosis in our health system, involving convergence of AI technologies in natural language processing, speech analytics, medical image computing, data mining, machine learning, computer vision, visualization, and edge computing. We hope to engage a meaningful conversation on the possibility of cognitive automation in medicine. Do we need new scientific advances in AI like deep learning for cognitive automation? If cognitive automation is successful in medicine, what would be the future role of physicians? What happens to the patient-physician relationship and patient experience?

Biosketch: Stephen T.C. Wong, PhD, PE (FIEEE, FAMIA, FAIMBE, FAAIA) holds the John S. Dunn Sr. Presidential Chair and is the founding Chair of Systems Medicine and Bioengineering Department, Director of the T.T. & W.F. Chao Center for BRAIN, Director of Translational Biophotonics Laboratory, Chief of Medical Physics, and Associate Director of Cancer Center, Houston Methodist Hospital. He is a Professor of Radiology, Neurosciences, Pathology and Laboratory of Weill Cornell Medical College. Previously, he was a Professor at UCSF and Harvard University, handling major biomedical information and imaging system design and implementation at UCSF, Harvard Medical School and the Brigham and Women's Hospital. Stephen has served in executive roles in major technology-driven companies including HP, AT&T Bell Labs, Philips Healthcare where his group implemented the largest radiology information systems in Europe, and Charles Schwab, where his group produced an electronic trading platform. His laboratory investigates molecular mechanisms of cancer and neurological disorders and translates findings into diagnostics and therapeutics. Wong received senior executive education from Stanford University, MIT, and Columbia University and is a licensed professional engineer (PE) in EE. He co-founded IEEE TC in BHI and helped revamp IEEE JBHI and launch IEEE BHI-BSN conferences.

Stephen lived and worked in Hong Kong, Manila, Perth, Canberra, Singapore, Orlando, Tokyo, Amsterdam, San Francisco, Boston, and now Houston. He dedicates the second half of his life in solving disease problems.

Talk recording: https://pitt.zoom.us/rec/share/B2IndkDWM7_5vfryhRkWbUbn8Vw1k7GLJeWxWXIz1lfkg0gLY244Z9r-MH9iYai.cLrMuBQj71VA4D_r