

ALLEN S. HALL, JR. SERIES

REHABILITATION ROBOTICS: IMPROVING EVERYDAY HUMAN FUNCTIONS

THURSDAY, MAY 8
10:00AM-11:30AM POTR 234



SUNIL AGRAWAL

BIO: Sunil Agrawal received a Ph.D. degree in Mechanical Engineering from Stanford University in 1990. He is currently a Professor and Director of Robotics and Rehabilitation (ROAR) Laboratory at Columbia University, located both in engineering and medical campuses of the university. Dr. Agrawal has published more than 500 journal and conference papers, 20 U.S. patents, and 4 books. He is a Fellow of the ASME and AIMBE. His honors include a NSF Presidential Faculty Fellowship from the White House in 1994, a Bessel Prize from Germany in 2003, and a Humboldt US Senior Scientist Award in 2007. He is a recipient of 2016 Machine Design Award from ASME for “seminal contributions to design of robotic exoskeletons for gait training of stroke patients” and 2016 Mechanisms and Robotics Award from ASME for “cumulative contributions and being an international leading figure in mechanical design and robotics”. He is a 2023 recipient of a Paintal Chair from Indian National Science Academy. He was a Plenary Speaker at the 2024 IEEE International Conference in Robotics and Automation in Yokohama. He has successfully directed 40+ PhD student theses and has received Best Paper awards in ASME and IEEE sponsored robotics conferences. He is the founding Editor-in-Chief of the journal “Wearable Technologies” published by Cambridge University Press. He organized the IEEE BioRob 2020 conference in New York City and served as its conference chair.

ABSTRACT: Neural disorders, old age, and traumatic brain injury limit activities of daily living. Robotics can be used in novel ways to characterize human neuromuscular responses and retrain human functions. Columbia University Robotics and Rehabilitation (ROAR) Laboratory designs innovative mechanisms/robotics with these goals and performs scientific studies to improve human functions such as standing, walking, stairclimbing, trunk control, head turning, and others. Human experiments have targeted individuals with stroke, cerebral palsy, Parkinson’s disease, spinal cord injury, ALS, and elderly subjects. The talk will provide an overview of these robotic technologies and scientific studies performed with them to demonstrate strong potential of rehabilitation robotics to improve human functions and quality of life of people.