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BME Spring 2024 Seminar Series

"A New Paradigm in Personalized Aquatic Therapy and Rehabilitation"

Yeonsik Noh, Ph.D.

Assistant Professor

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University of Massachusetts Amherst

Thursday February 22, 2024 11am-12pm in UTEB150

WebEx: Scan code or click here

Abstract: Aquatic therapy has been widely used for patients with motor disabilities, stroke, arthritis, and Parkinson's disease due to the benefits of water, such as its buoyancy, hydrostatic pressure, density and viscosity, and thermodynamic properties. Aquatic therapy provides diverse approaches to rehabilitation, including traditional functional therapies, neurodevelopmental treatment, proprioceptive neuromuscular facilitation, and task-specific training. Most research on aquatic therapy and rehabilitation have reported its effects and benefits through comparison before and after aquatic therapy and rehabilitation, and also from land-based ones. It was revealed that aquatic therapy was superior to land-based therapy in improving muscle strength and functional independence for individuals with stroke, according to the 2011 Cochrane Review. However, while aquatic therapy is a promising method, existing clinic settings do not support monitoring physiological and motor changes in real time during aquatic therapy and rehabilitation. Moreover, unlike land-based therapies and rehabilitations, devices for data acquisition and real-time analysis in the aquatic environment are nearly non-existent for electrophysiological and motor monitoring. To provide personalized therapy and to secure safety during aquatic therapy, it is necessary to give patients' cardiovascular and musculoskeletal information to practitioners in real-time. In this talk, Dr. Noh will introduce underwater physiological monitoring techniques and their use in aquatic therapy and rehabilitation.

Biography: Dr. Yeonsik Noh is an assistant professor at the College of Nursing and Department of Electrical and Computer Engineering (joint), and the Department of Biomedical Engineering (adjunct) at the University of Massachusetts Amherst.. His research has focused on developing wearable health monitoring devices and systems for personalized home/mobile/ sports healthcare in daily life. It has especially researched the next-generation personalized healthcare and health management strategy/ system based on the Nursing Engineering approach to proper disease and symptoms management and therapy. His one of the latest research focuses on developing biometric devices for underwater application by using hydrophobic polymer electrodes and developing the body sensor network for underwater application. This research will contribute to the monitoring/ analysis of bio-related parameters and evaluate rehabilitation during aquatic exercise, diving, and underwater activity. And he is an NSF CAREER awardee in 2023.

For additional information, please visit **www.bme.uconn.edu** or Prof. Fayekah Assanah at fayekah.assanah@uconn.edu or Sarah Dunnack at sarah.dunnack@uconn.edu