Towards Automated Measurement of Rehab Dose and Response

February 18

Tuesday, 12:30 pm

Billings Building—Rosedale Room

SPEAKER:

Heidi Schambra, MD

Associate Professor, Departments of Neurology & Rehabilitation Medicine

Director, Division of Neuro-Epidemiology

Director, Research Strategy in Neurology

Investigator, Neuroscience Institute

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Host: Kathleen M. Friel, Ph.D.

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Abstract

Careful measurement of dose and response is a central tenant of biomedical research, but is largely lacking in current rehabilitation practice after stroke. A major rate limiting step has been the availability of precise, practical tools to measure upper limb movements (dose) and movement quality (response) in rehabilitating stroke patients. In this talk, Dr. Schambra will discuss work in her lab to build these tools. She will discuss the concept of movement primitives as fundamental units of measure, the design of deep learning approaches to count and appraise primitives from inertial sensor data, and new directions using video-based motion capture.
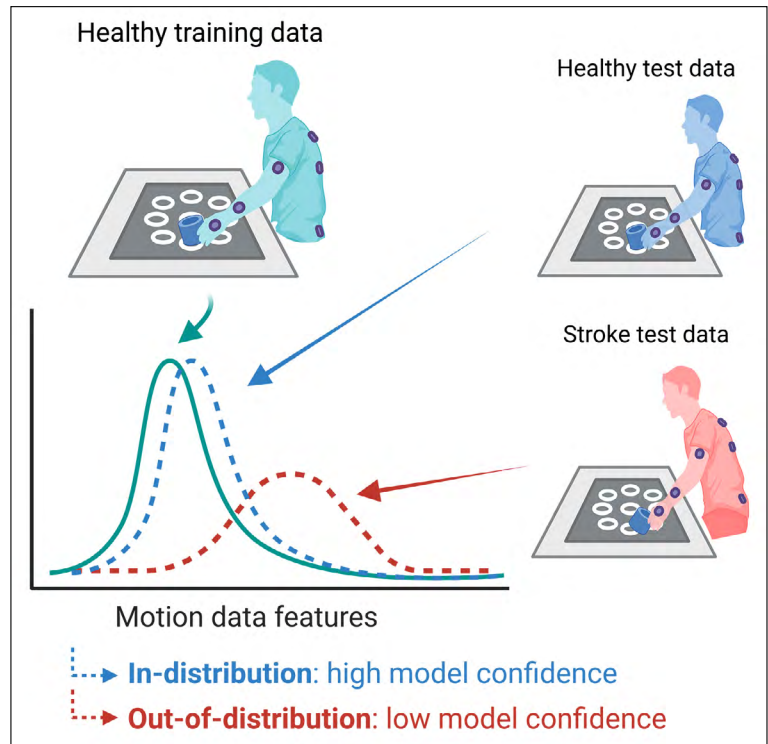
Publications

1. Yu B, Kaku A, Liu K, Parnandi A, Fokas E, Venkatesan A, Pandit N, Ranganath R*, Schambra HM,* Fernandez-Granda C*. *Quantifying Impairment and Disease Severity Using AI Models Trained on Healthy Subjects.* NPJ Digital Medicine. 2024 Jul 6;7(1):180. PMID: 38969786; PMCID: PMC11226623.

2. Parnandi A, Kaku A, Venkatesan A, Pandit N, Fokas E, Yu B, Kim G, Nilsen D, Fernandez-Granda C*, Schambra H*. *Data-Driven Quantitation of Movement Abnormality after Stroke.* Bioengineering. 2023; 10(6):648. PMID: 37370579

3. Parnandi A, Kaku A, Venkatesan A, Pandit N, Wirtanen A, Rajamohan H, Venkataramanan K, Nilsen D, Fernandez-Granda C*, Schambra HM*. *PrimSeq: a deep learning-based pipeline to quantitate rehabilitation training.* PLOS Digital Health. 2022; 1(6): e0000044. PMID: 36420347

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