JOHNS HOPKINS BLOOMBERG SCHOOL of PUBLIC HEALTH

Department of Biostatistics

BIOSTATISTICS GRAND ROUNDS

"Dedicated to Advancing the Practice of Biostatistics at the Johns Hopkins Medical Institution"

Assessing Systematic Effects of Stroke on Motor Control Using Hierarchical Function-on-Scalar Regression

Time	Schedule
12:05-12:20	John Krakauer, Professor of Neurology and Neuroscience, Scientific introduction
12:20-12:50	Jeff Goldsmith, Assistant Professor of Biostatistics Assessing Systematic Effects of Stroke on Motor Control Using Hierarchical Function-on-Scalar Regression
12:50 -1:00	Pablo Celnik, Associate Professor of Physical Medicine and Rehabilitation Scientific discussion
1:00-1:10	Jaroslaw Harezlak, Associate Professor of Biostatistics Biostatistical discussion
1:10-1:20	Response and discussions

Abstract

This work is concerned with understanding common population-level effects of stroke on motor control while accounting for possible subject-level idiosyncratic effects. Upper extremity motor control for each subject is assessed through repeated planar reaching motions from a central point to eight pre specified targets arranged on a circle. We observe the kinematic data for hand position as a bivariate function of time for each reach. Our goal is to estimate the bivariate function-on-scalar regression with subject-level random functional effects while accounting for potential correlation in residual curves; covariates of interest are severity of motor impairment and target number. We express fixed effects and random effects using penalized splines, and allow for residual correlation using a Wishart prior distribution. Parameters are jointly estimated in a Bayesian framework, and we implement a computationally efficient approximation algorithm using variational Bayes. Simulations indicate that the proposed method yields accurate estimation and inference, and application results suggest that the effect of stroke on motor control has a systematic component observed across subjects.

Monday, SEPTEMBER 16, 2013, 12:05pm, ROOM W4030,
WOLFE STREET, SCHOOL OF PUBLIC HEALTH BUILDING

For more information contact: Patty Hubbard, phone: 410-955-7044; FAX: 410-955-0958; email: phubbard@jhsph.edu. For disability access information or assistive listening devices, please contact the School of Public Health Office of Support Services at 410-955-1197.