Distinguished Visitor Lecture Series

Susan Murphy

Harvard University

Susan Murphy is Professor of Statistics at Harvard University, Radcliffe Alumnae Professor at the Radcliffe Institute, Harvard University, and Professor of Computer Science at the Harvard John A. Paulson School of Engineering and Applied Sciences. Her current research interests concern clinical trial design and the development of data analytic methods for informing multi-stage decision making in health, particularly in mobile health. She is a 2013 MacArthur Fellow, a member of the National Academy of Sciences and the National Academy of Medicine, both of the US National Academies. She is currently president of the Bernoulli Society and incoming president of the Institute for Mathematical Statistics.

Stratified Micro-randomized Trials with Applications in Mobile Health

18 February 2019 (Monday)
9.00 – 10.00am, IMS Auditorium

Technological advancements in the field of mobile devices and wearable sensors make it possible to deliver treatments anytime and anywhere to users like you and me. Increasingly the delivery of these treatments is triggered by detections of vulnerability. Two challenges are that vulnerability may be impacted by prior treatment and treatment provided at time t is expected to have an impact on users over a span of time during which subsequent treatments may be provided. Here we discuss our work on the design of a mobile health smoking cessation study in which the above two challenges arose. Multiple online data analysis algorithms are used for detection, for example, of physiological stress as well as forecasting the remaining number of vulnerable times in the day. These algorithms are then inputs into a randomization algorithm that ensures that each user is randomized to each treatment an appropriate number of times per day. The stratified micro-randomized trial involves not only considerations of the randomization algorithm but a precise statement of the meaning of the causal treatment effects along with primary analyses and sample size calculations.

Assessing Time-Varying Causal Interactions and Treatment Effects with Applications to Mobile Health

25 February 2019 (Monday)
9.00 – 10.00am, IMS Auditorium

Mobile devices along with wearable sensors facilitate our ability to deliver treatments anytime and anywhere. Indeed mobile interventions are being developed and employed across a variety of health fields, including to support HIV medication adherence as well as encourage physical activity and healthier eating. A critical question in the optimization of mobile health interventions is: “When and in which contexts, is it most useful to deliver treatments to the user?” This question concerns time-varying dynamic moderation by the context (location, stress, ambient noise, etc.) of the effectiveness of the treatments on user behavior. In this talk we discuss data analyses for use in assessing moderation. We illustrate this approach with the micro-randomized trial of HeartSteps, a physical activity mobile intervention.

Photo by NordWood Themes on Unsplash

Venue and Organizer
Institute for Mathematical Sciences
National University of Singapore
3 Prince George’s Park
Singapore 118402

ims.nus.edu.sg

ims@nus.edu.sg

Follow us on Facebook
facebook.com/imsnussg

Find us on Youtube
bit.ly/2H8XeY6