

DISTINGUISHED LECTURE SERIES

Targeted Learning with Applications to Genomic Studies

We consider data sets in which one observes a large number of covariates, including genomic measurements, possibly a treatment of interest, and a subsequent outcome. We present the roadmap of targeted learning involving specifying the statistical model, and a collection of statistical queries about the probability distribution of the data to formally define the statistical estimation problem. We suggest both causal effect queries as well as variable importance queries that can handle both discrete variables as well as continuous variables. We present the general targeted maximum likelihood estimation methodology, incorporating super-learning and highly adaptive lasso as a particularly powerful machine learning algorithm, and corresponding statistical inference. The statistical inference and multiple testing adjustment can be based on a multivariate normal limit distribution, or a nonparametric bootstrap method, thereby utilizing dependence among test statistics. We also present a cross-validated TMLE for data adaptively determined target estimands/statistical queries. Methods are demonstrated with simulations and data sets.



Professor Mark van der Laan

University of California, Berkeley, USA

9 January 2022, Sunday
4–5pm (GMT-8, Los Angeles USA)

10 January 2022, Monday
8–9am (GMT+8, Singapore)

Virtual via Zoom



Photo by Christina Morillo on Pexels

Mark van der Laan, Ph.D., is a Professor of Biostatistics and Statistics at UC Berkeley. His research interests include statistical methods in genomics (i.e., computational biology), survival analysis, censored data, targeted maximum likelihood estimation in semiparametric models, causal inference, data adaptive loss-based super learning, and multiple testing. Prof. van der Laan came to UC Berkeley from the Netherlands' University of Utrecht, where he studied mathematics (1985-1990) and obtained his Ph.D. (1993). He received the 2004 Mortimer Spiegelman Award, the 2005 van Dantzig Award, and the 2005 (COPSS) Presidential Award. Prof. van der Laan has been awarded the UC Berkeley Chancellor Endowed Chair 2005-2008, and the long-term Jiann-Ping Hsu/Karl E. Peace Endowed Chair in Biostatistics starting 2005.

Online event. Registration required

<https://tinyurl.com/ImStatisticalReg>

Program webpage

<https://tinyurl.com/imgeneJan2022>

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