FACULTY OF HEALTH AND MEDICAL SCIENCES
UNIVERSITY OF COPENHAGEN

DSTS
Dansk Selskab for Teoretisk Statistik

Danish Society for Biopharmaceutical Statistics

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Biostatistics seminar series

Monday March 9th, seminar at 5 to 6 pm
Panum Tower, Nielsine Nielsen aud. (ground floor)
Blegdamsvej 3b, 2200 København

Targeted Learning, Super Learning, and the Highly Adaptive Lasso

Professor Mark van der Laan
University of California, Berkeley

On behalf of the Novo Nordisk–UC Berkeley-University of Copenhagen Causal Inference for Drug Discovery Initiative, it gives us great pleasure to invite to a seminar by Professor Mark van der Laan.

We review targeted minimum loss estimation (TMLE), which provides a general template for the construction of asymptotically efficient plug-in estimators of a target estimand under realistic statistical assumptions. TMLE involves maximizing a parametric likelihood along a so-called least favourable parametric model that uses as off-set an initial estimator (e.g., ensemble super-learner) of the relevant functional of the data distribution. The asymptotic normality and efficiency of the TMLE relies on the asymptotic negligibility of a second-order term. We present a general Highly Adaptive Lasso (HAL) estimator of the data distribution and its functionals that converges at a sufficient $n^{-1/3}$ regardless of the dimensionality of the data/model, under almost no additional regularity. This allows us to propose a general TMLE that is asymptotically efficient in great generality. We also discuss the appealing properties of HAL, due to HAL being an MLE over a big function class, and present various of its implications for super-learning and TMLE.

Mark van der Laan is Jiann-Ping Hsu/Karl E. Peace Professor in Biostatistics & Statistics at UC Berkeley. He is world leading in combining data adaptive methods from Machine Learning/Artificial Intelligence with causal inference. A few of his recent achievement include :

- Founding editor of the journal Casual inference
- co-authored more than 350 publications
- advisor to FDA and Kaiser Permanente on their RWE efforts

Participation is free and open to everyone.