JONG-MYUN MOON

POSITION:

Post-Doctoral Research Associate, University College London, 2014 Oct - Present
Research Staff, Centre for Microdata Methods and Practice (Cemmap), 2014 Oct - Present

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EDUCATION:

Ph.D. Economics, University of California, San Diego, 2014
M.A. Economics, Seoul National University, 2008
B.A. Economics, Seoul National University, 2006
B.S. Electrical Engineering, Seoul National University, 2001

TEACHING EXPERIENCE:

2008-Present: *Teaching Assistant*, UCSD Economics,
Econ 1 (Principles of Microeconomics)
Econ 100 A/C (Microeconomics)
Econ 109 (Game Theory)
Econ 110 A (Macroeconomics)
Econ 114 (Economics of Immigration)
Econ 120 A/B/C (Econometrics)
Econ 200 B (Ph.D. Microeconomics)
Econ 220 A/B/C (Ph.D. Econometrics)

HONORS, SCHOLARSHIPS AND FELLOWSHIPS:

Teaching Assistant Excellence Award for Graduate Class, UCSD Economics, 2012
Teaching Assistant Excellence Award for Undergraduate Class, UCSD Economics, 2010
Graduate Summer Research Fellowship, UCSD Economics, 2009
Tae-Sung Kim Award, Seoul National University, Economics, 2007

REFEREE SERVICE:

Econometric Theory
Journal of Business & Economic Statistics
Journal of Econometrics

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RESEARCH:

Nonparametric Tests of Density Ratio Ordering
With Brendan Beare. Published in *Econometric Theory (2014)*

We study a family of nonparametric tests of density ratio ordering between two continuous probability distributions on the real line. Density ratio ordering is satisfied when the two distributions admit a non-increasing density ratio. Equivalently, density ratio ordering is satisfied when the ordinal dominance curve associated with the two distributions is concave. To test this property, we consider statistics based on the Lp-distance between an empirical ordinal dominance curve and its least concave majorant. We derive the limit distribution of these statistics when density ratio ordering is satisfied. Further, we establish that, when $p<=2$, the limit distribution is stochastically largest when the two distributions are equal. When $p>2$, this is not the case, and in fact the limit distribution diverges to infinity along a suitably chosen sequence of concave ordinal dominance curves. Our results serve to clarify, extend and amend assertions appearing previously in the literature for the cases and. We provide numerical evidence confirming their relevance in finite samples.

Maximum Likelihood Estimation and Inference in Finitely Identified Parametric Models
With Ivana Komunjer. Work in progress (Manuscript available on request)

This paper is concerned with the problem of maximum likelihood estimation and inference in parametric models that are finitely identified. That identification is finite means that there is a finite set of parameter values that are observationally equivalent, i.e. they generate the same distribution of the observed variables. This implies in particular that no amount of sample information (data) can allow the econometrician to distinguish between those parameter values. Under finite identification, the asymptotic distribution of the maximum likelihood estimator is nonstandard and we study its properties. In particular, we show that bootstrap can be used to uncover the identified set. Inference on the set is conducted using likelihood ratio, Lagrange multiplier and Wald test statistics, which in this situation are no longer asymptotically equivalent.

Sieve Estimation of Pairwise Comparison Models
Work in progress (Manuscript available on request)

We consider a situation when parameters of interest can be identified, without identifying nuisance parameters, by a certain comparison of two independent samples. When nuisance parameters are difficult to estimate, such an identification strategy is particularly attractive. A natural estimator is then obtained by minimizing a sum of all pairwise comparisons, which is a U-process of degree 2. When the estimated parameter is Euclidean, the asymptotic property of such an estimator is completely solved by Sherman (1993,1994). Our contributions are as follows. First, an infinite-dimensional (function) parameter along with the Euclidean parameter is included in the estimation. We employ the method of sieves and estimate both parameters jointly. In particular, a so-called single-index or bundled-parameter structure is allowed in the sieve estimation. Second, we propose a pairwise weighted bootstrap and prove its asymptotic validity. The literature lacks a simulation-based inference procedure even for the Euclidean parameter case. Lastly, we apply the developed asymptotic theory to non-parametric transformation models and the clustering analysis. Both estimators are new and of independent interest.

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Projected Random Bellman Operator
With Dennis Kristensen and Bertel Scherning. Work in progress (Manuscript available on request)

Discrete decision process (DDP) is a subclass of Markov decision problems and forms a basis for the popular structural econometric models known as dynamic discrete choice (DDC) models (Rust, 1988). The major challenge in the application of DDP is to find a solution of the model or, equivalently, to find a fixed point of a Bellman operator. This is a difficult problem due to the curse of dimensionality. Rust (1997) showed that using Monte Carlo integration method can break the curse of dimensionality. We improve upon this result by employing a sieve approximation technique combined with a Monte Carlo method. The main idea is to project a Markov kernel density, instead of a Bellman operator, to a finite-dimensional sieve space. It is shown that a projected version of the random Bellman operator maintains the contraction property. Moreover, the proposed method effectively casts an infinite-dimensional problem to a finite-dimensional problem. As such, well-known numerical routines for finite-dimensional problems can be easily applied. The approximate fixed point obtained by the proposed method converges to the true fixed point at root-n-rate for n being the Monte Carlo simulation size. In addition, if certain conditions are met, it converges weakly to a Gaussian process at root-n -rate.

Regression for Network Data
Work in progress

Network data is characterized by a combination of node-specific and edge-specific variables. In the statistical analysis of network data, the standard inference procedure is seriously misleading due to the interdependency of edges through shared nodes. The literature lacks a proper asymptotic theory even for the OLS estimator. A permutation test called the quadratic assignment procedure (QAP) is (to my best knowledge) the only justified inference procedure. Nonetheless, QAP is not scalable to a large network, and its null hypothesis is restrictive. For instance, one parameter significance testing is not possible. This paper studies the asymptotic properties of M-estimators with network data, which covers linear and nonlinear regressions as well as the maximum likelihood estimation. By a novel decomposition technique, we show that the asymptotic distribution of the estimator is dominated by the sampling variance of node-specific variables. A maximal inequality for network data is proved and used to show that the sampling variance from edge-specific variables is asymptotically negligible. The consistency and the asymptotic normality of the estimator are established.

Last updated: June 8, 2015