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DEMPSTER AWARD COLLOQUIUM

MONDAY, APRIL 25, 2016

TALK: 4:30 PM — SCIENCE CENTER RM. 705

RECEPTION: 5:15 PM — SCIENCE CENTER, 7TH FLOOR

“Designing Test Information and Test Information in Design”

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ABSTRACT

DeGroot (1962) developed a general framework for constructing Bayesian measures of the expected information that an experiment will provide for estimation. We propose an analogous framework for Bayesian measures of information for hypothesis testing, and illustrate how these measures can be applied in experimental design. In contrast to estimation information measures that are typically used in experimental design for surface estimation, test information measures are more useful in experimental design for hypothesis testing, model selection, and classification. Indeed, one test information measure suggested by our framework is probability based, and in design contexts where a decision problem is of interest, it has more appealing properties than variance based measures. The underlying intuition of our design proposals is straightforward: to distinguish between two or more models we should collect data from regions of the covariate space for which the models differ most. Nicolae, Meng and Kong (2008) give an asymptotic equivalence between their test information measures and Fisher information. We extend this result to all test information measures under our framework, and hence further our understanding of the links between test and estimation information measures.