Comparison between fiducial and objective Bayesian inference

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Abstract

R. A. Fisher's fiducial inference has been the subject of many discussions and controversies ever since he introduced the idea during the 1930's. The idea experienced a bumpy ride, to say the least, during its early years and one can safely say that it eventually fell into disfavor among mainstream statisticians. However, it appears to have made a resurgence recently under the label of generalized inference. In this new guise fiducial inference has proved to be a useful tool for deriving statistical procedures for problems where frequentist methods with good properties were previously unavailable. Therefore we believe that the fiducial argument of R.A. Fisher deserves a fresh look from a new angle.

In this talk we first generalize Fisher's fiducial argument and obtain a fiducial recipe applicable in virtually any situation. We demonstrate this fiducial recipe on examples of varying complexity. We also investigate, by simulation and by theoretical considerations, some properties of the statistical procedures derived by the fiducial recipe showing they often posses good repeated sampling, frequentist properties. We compare the generalized fiducial distributions to corresponding objective Bayesian distributions.

Portions of this talk are based on a joined work with Hari Iyer, Thomas C.M. Lee, Jessi Cisewski and Dongchu Sun.