

Confidence distribution: a sample-dependent distribution function for inference

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Distributional inference aims to define a sample-dependent distribution on the parameter space that can provide meaningful answers for all sorts of questions related to statistical inference. In recent years, there have been several breakthroughs coming from different communities studying in their turn objective Bayesian inference, confidence distributions, generalized fiducial inference and belief functions, leading to renewed interest in the field. This talk will review some recent developments of confidence distributions, along with a modern definition and interpretation of the concept. A confidence distribution uses a distribution function to estimate a parameter of interest. Some researchers have suggested that a confidence distribution is a “frequentist analogue of a Bayesian posterior”, although the notion of confidence distribution, especially in its asymptotic form, is much broader. This talk will provide a unified framework for statistical inference under a frequentist criterion. It will also provide real data examples that highlight the potential and added values of confidence distributions as an effective tool for modern statistical inference.

Key Words: Statistical inference; frequentist/fiducial/Bayesian methods; likelihood function; estimation theory.