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BAT.jl –Upgrading the Bayesian Analysis Toolkit

Tuesday 5 November 2019 16:15 (15 minutes)

BAT.jl, the Julia version of the Bayesian Analysis Toolkit, is a software package which is designed to help solve statistical problems encountered in Bayesian inference. Typical examples are the extraction of the values of the free parameters of a model, the comparison of different models in the light of a given data set, and the test of the validity of a model to represent the data set at hand. BAT.jl is based on Bayes'Theorem and it is realized with the use of different algorithms. These give access to the full posterior probability distribution, and they enable parameter estimation, limit setting and uncertainty propagation.

BAT.jl is implemented in Julia and allows for a flexible definition of mathematical models and applications while keeping in mind the reliability and speed requirements of the numerical operations. It provides implementations (or links to implementations) of algorithms for sampling, optimization and integration. While predefined models exist for standard cases, such as simple counting experiments, binomial problems or Gaussian models, its full strength lies in the analysis of complex and high-dimensional models often encountered in high energy and nuclear physics.

BAT.jl is a completely re-written code based on the original BAT code written in C++ . There is no backward compatibility whatsoever, but the spirit is the same: providing a tool for Bayesian computations of complex models.

The poster will summarize the current status of the BAT.jl project and highlight the challenges faced in the fields of high energy and nuclear physics.

Consider for promotion

No

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