ABC of the Future

Presentation follows loosely the structure of *"ABC of the Future"*, Pesonen et al.

ABC of the Future

Henri Pesonen[1], Umberto Simola[3], Alvaro Köhn-Luque[1], Henri Vuollekoski[4], Xiaoran Lai[1], Arnoldo Frigessi[1,2], Samuel Kaski[4,5], David T. Frazier[6], Worapree Maneesoonthorn[7], Gael M. Martin[6], and Jukka Corander[1,3,8]

[1]Oslo Centre for Biostatistics and Epidemiology, University of Oslo, Oslo, Norway

[2]Oslo Centre for Biostatistics and Epidemiology, Oslo University Hospital, Oslo, Norway

[3]Helsinki Institute of Information Technology, Department of Mathematics and Statistics, University of Helsinki, Finland

[4]Helsinki Institute of Information Technology, Department of Computer Science, Aalto University, Finland

[5]Department of Computer Science, University of Manchester, UK

[6]Department of Econometrics & Business Statistics, Monash University, Australia

[7]Melbourne Business School, the University of Melbourne, Australia

[8]Parasites and Microbes, Wellcome Sanger Institute, UK

Abstract

Approximate Bayesian computation (ABC) has advanced in two decades from a seminal idea to a practically applicable inference tool for simulator-based statistical models, which are becoming increasingly popular in many research domains. The computational

1

Inference without likelihoods

i.e. "How I learned how to infer parameters with having an access to the analytical formulation of likelihood"

- LFI: Likelihood-free inference, or SBI: simulator based inference

  - ABC: Approximate Bayesian Computation

    - Draw a sample from an approximate posterior

  - SL: Synthetic likelihood

    - Approximate the likelihood with a simulated sample