Introduction to Bayesian Statistics

🏵 Objective

The online course provides an introduction to Bayesian statistics to research scientists. Participants will familiarize themselves with the Bayesian approach using real-life examples. Note that "Bayesian statistics" is a huge subject and this short course can only cover the basic principles.

🧭 Description

Bayesian techniques match the scientific discovery process very well. We start from a hypothesis (our "prior knowledge"), then carry out experiments. Based on the results (the "evidence") we update our knowledge (the "posterior"). The prior and posterior knowledge are represented by probability distributions, providing information on the reliability of the conclusions. In addition, the Bayesian formalism enables us to reason about causes and consequences, which opens up exciting new avenues towards machine learning.

Topics:

- Introduction to Bayesian principles using a simple diagnostic kit example: Bayes' Theorem
- Estimating a single parameter of a probability distribution using the Binomial as example: Conjugate priors, posterior updates, posterior predictive distribution
- Estimating the parameters of the Multinomial distribution using blood group phenotypes
- Towards modelling causality: Introduction to Bayesian Networks

⚙ Methodology

The participants perform simple hands-on exercises using the R programming language during the course.
After the course they complete an online homework exercise.
The necessary server infrastructure is provided by the instructor.

ℹ Conditions

The participants must have solid statistical knowledge and familiarity with probability theory, especially with probability distributions.
Basic R programming experience is needed for the online homework.

Trainer

Dr. András Aszódi
VBCF BioComp, Vienna

- Holds a PhD in chemistry
- He has extensive computational biology experience, both in academia and industry
- His develops short courses on biostatistics and scientific programming

ℹ Organizational Information

Language / Format	English / Online
Target group	Doctoral Candidates at all stages and Postdocs (R2/R3) from all faculties
Date	Wednesday, 26 June 2024, 9:00 – 13:00
Registration	**For registration click here**