

Vak: Data Science 2

credits: 5

Vakcode BFVM22DATASC2
Naam Data Science 2
Studiejaar 2022-2023
ECTS credits 5
Taal Nederlands
Coördinator F. Feenstra

Werkvormen Hoorcollege
Toetsen TOETS-01 - Computer, eigen organisatie
TOETS-02 - Computer, eigen organisatie

Leeruitkomsten

The student:

- can assess the quality of life science data and perform data clean-up
- can apply frequentist and Bayesian methods to estimate parameters with standard errors and confidence intervals
- can analyze time-series data, including visualisation, calculation of descriptive statistics, resampling and interpolation, removal of noise and baselines, and the application of various linear filters and other data transformations in the time- and frequency domains
- can discover and investigate apparent relationships between multiple time series

Inhoud

Bayesian statistics (3w): frequentist estimation methods (e.g. method of moments, least squares and maximum likelihood), Bayes' rule, Bayesian estimation, bootstrapping, non-normality and outliers

Signal analysis (4w): (auto/cross)correlation, interpolation, polynomial fits, Fourier transform (DFT, FFT), convolution, windowing, filtering (LTI, FIR, IIR), smoothing

The course will start with a repetition of basic descriptive statistical concepts and estimation techniques and extend these to Bayesian theory. The student will apply statistical methods to characterise biometric (time) series and perform quality control (e.g. missing data, outliers). Signal analysis techniques will be used to perform data transformations and obtain relevant summary statistics, both descriptive statistics of the data samples (mean+SD, correlation, distribution, etc.) as well as dynamic characteristics of the signal (autocorrelation, frequency-content, etc.). The student will learn to calculate and update outcomes dynamically as data streams are gathered. Methods will be implemented in Python using various data analysis modules (numpy/pandas/matplotlib).

Opgenomen in opleiding(en)

Master Data Sciences for the Life Science

School(s)

Instituut voor Life Science & Technology

share your talent. move the world.