Data Analytics with Julia – from Hours to Minutes (taught by Dr. Christian Kauth)

This course provides an introduction to the modern programming language Julia. It aims to provide you with a comprehensive understanding of Julia's data analytics, data visualization, and predictive modelling capabilities.

Julia is a high-level, high-performance programming language for technical computing, data analytics, and artificial intelligence. It has gained popularity in various areas of computing due to its combination of speed, expressiveness, and ease of use. What takes hours to Python or R, can be computed within minutes in Julia.

You will gain an overview of Julia, its history, and the benefits of using it for data analytics. We will focus on data manipulation and visualization using Julia. You'll enjoy the speed and performance advantages and understand the basics of parallel and distributed computing for Monte Carlo simulations. We'll take a glimpse at machine and deep learning and you'll learn how to interface Julia with other popular (yet slower) languages like Python and R.

Fun fact: From the design book of the makers of Julia: We want the speed of C with the dynamism of Ruby. We want a language that's homoiconic, with true macros like Lisp, but with obvious, familiar mathematical notation like Matlab. We want something as usable for general programming as Python, as easy for statistics as R, as natural for string processing as Perl, as good at gluing programs together as the shell. We want something that provides the distributed power of Hadoop.

Objectives

- To discover the Julia language (and optionally fall in love with it)
- To gain practical experience with Julia's data manipulation and visualization tools
- To have a glimpse at Julia's machine learning and deep learning capabilities
- To interface Julia with Python and R

Content

- How to write (fast & parallel) code in Julia
- How to manipulate tabular data in Julia
- How to visualize data in Julia
- How to train state of the art neural networks in Julia
- How to use the best of Python, R and Julia in one script

Preconditions

- None (introductory course).
- **Google account to access Google Colab.**

Duration

1 day (roughly 7*45 minutes)

Evaluation

take home exam: project work to be solved in *Julia*.

ECTS

0.5