

1. Basic robust statistical methods in Julia

Julia (<http://julialang.org/>) is a relatively new high-level, high-performance dynamic programming language for technical computing. It provides distributed parallel execution, numerical accuracy, and an extensive mathematical library. It also has an active developer community contributing new packages. See, for example, <https://github.com/JuliaStats>

This summer research project involves implementing some basic robust statistical methods (mostly robust estimators for linear regression models) in Julia. These are linear regression estimators that, unlike least-squares, remain informative even when the data contain a non-trivial proportion of aberrant or otherwise atypical observations. Using markdown you will also document the code you create to be deposited in a Github repository.

Minimum requirements: STAT305 & STAT306, being fluent in R, and having very good communication skills.

To apply: Please provide a cover letter and unofficial copy of your transcripts to:
Matias Salibian-Barrera, matias@stat.ubc.ca

2. Particle Filters in Julia

Julia (<http://julialang.org/>) is a relatively new high-level, high-performance dynamic programming language for technical computing. It provides distributed parallel execution, numerical accuracy, and an extensive mathematical library. It also has an active developer community contributing new packages. See, for example, <https://github.com/JuliaStats>

This summer research project involves implementing some basic particle filters in Julia. Particle filters (PF) are simulation-based methods to estimate unobserved states in a dynamic system based on noisy observations. The Kalman Filter is the optimal solution to this problem for linear models with Gaussian errors. The project will start with simple PFs, and if time permits will also include implementing a robust particle filter. The code (which will be deposited in a Github repository) needs to be carefully documented using markdown.

Minimum requirements: STAT305 & STAT306, being fluent in R, and having very good communication skills.

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