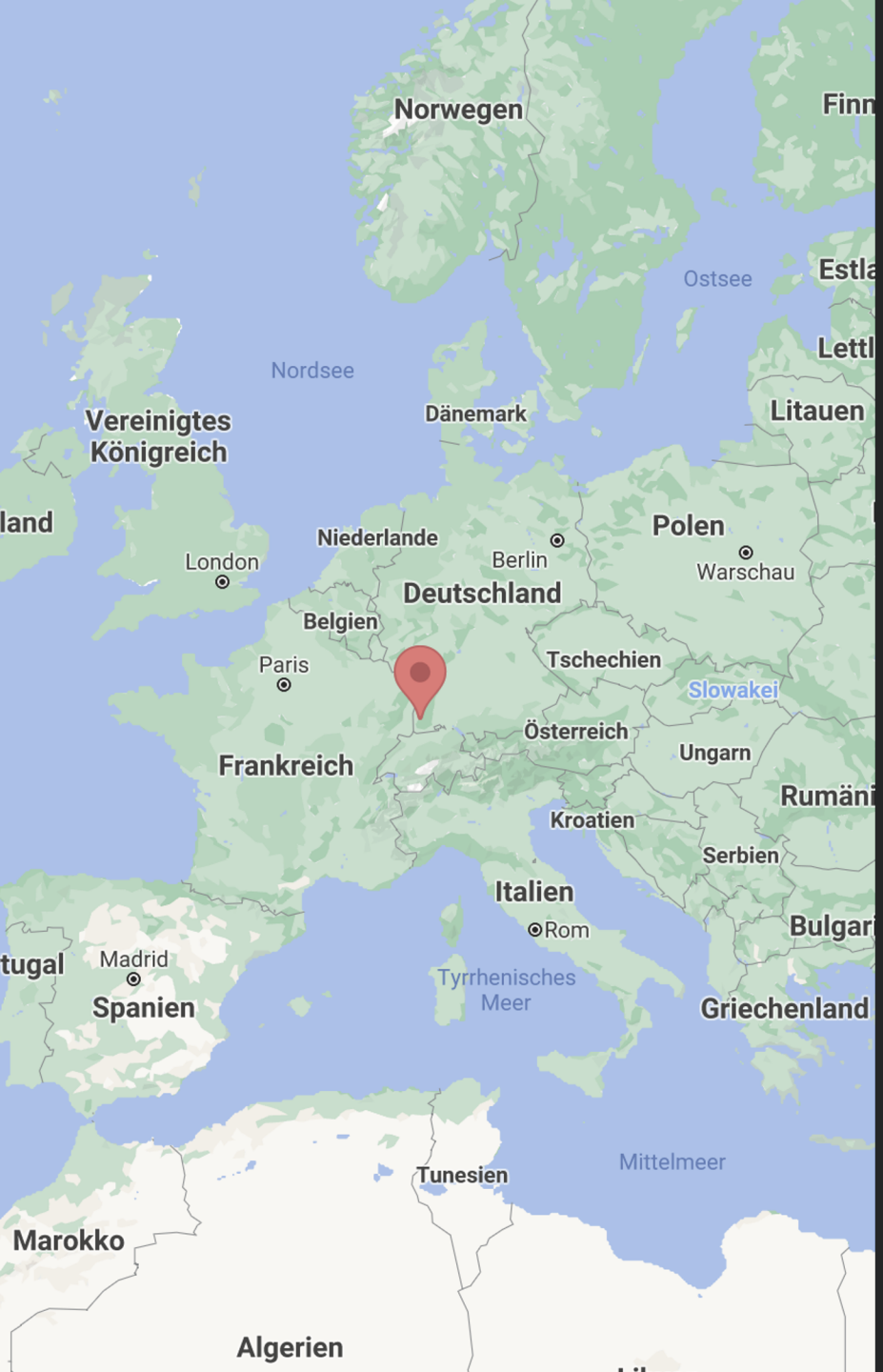
JULIA FOR R-LOVERS

Ideas for a dual-language workflow



ABOUT ME

Kyla McConnell

- PhD student in linguistics at the University of Freiburg
- R-stats enthusiast, Co-organizer of @RLadiesFreiburg
- Recently discovered the joys of Julia
  - *My use case: academic research, linear mixed effects models*

TODAY'S DEMO

What is Julia and why should you consider it?

Julia Basics, using R & Julia, and Julia for Data Science

Example: Fitting an LMM with MixedModels.jl

WHAT I WON'T COVER

01

Installing Julia, using iJulia for Jupyter Notebooks

- https://www.youtube.com/watch?v=oyx8M1yoboY

02

Programming concepts in Julia -> **Julia Academy**

- https://juliaacademy.com/p/julia-programming-for-nervous-beginners
- https://juliaacademy.com/p/intro-to-julia
- https://juliaacademy.com/p/julia-for-data-science

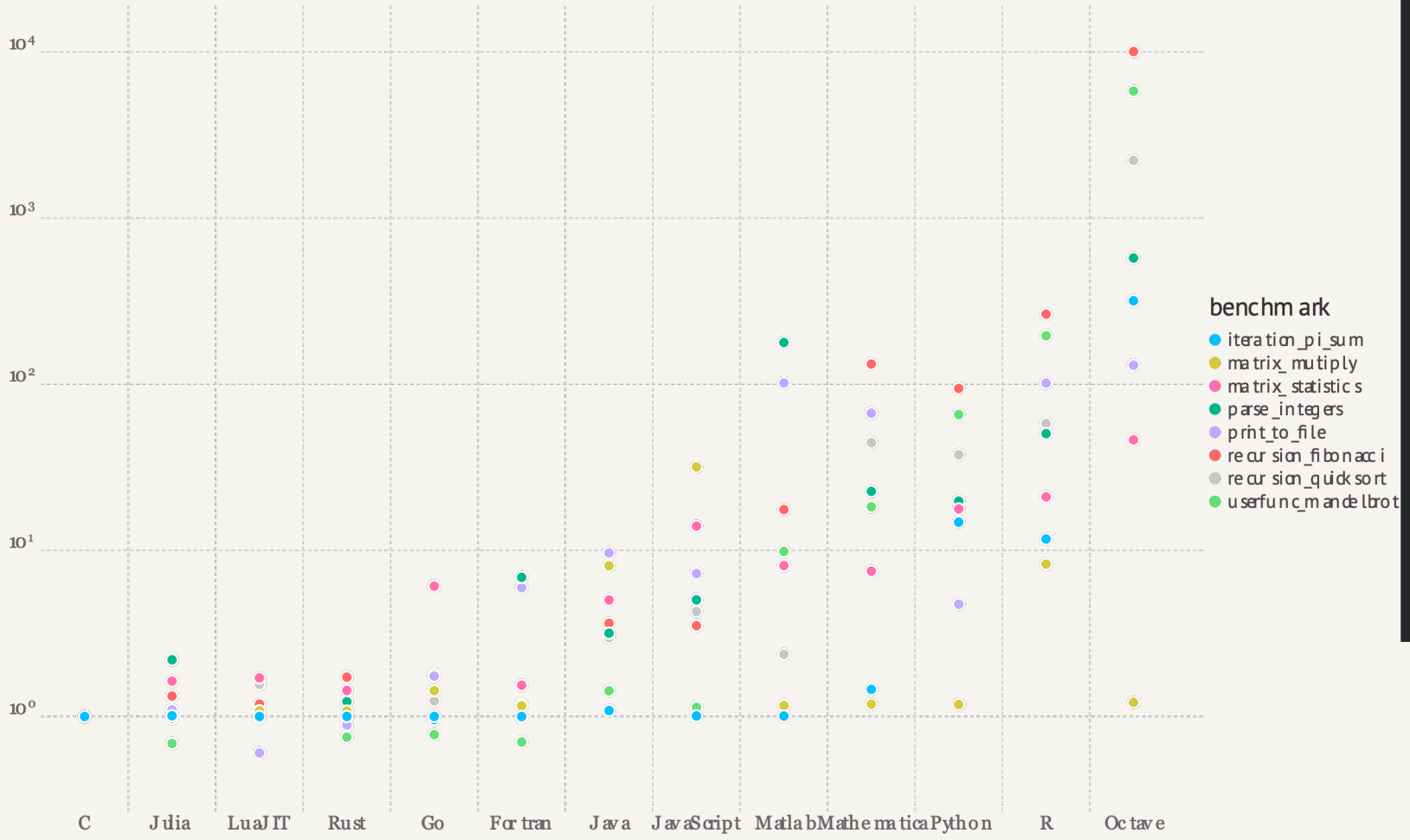
03

Statistical concepts or packages

- https://juliastats.org/MixedModels.jl/dev/

WHAT IS JULIA?

- General-purpose programming language but popular in data science communities
  - *Built with data science and machine learning in mind*
- Free & open source (like R and Python)
- Developed to be readable like Python but compiled quickly like C
- Young: < 10 years old (R is closer to 30 years old)

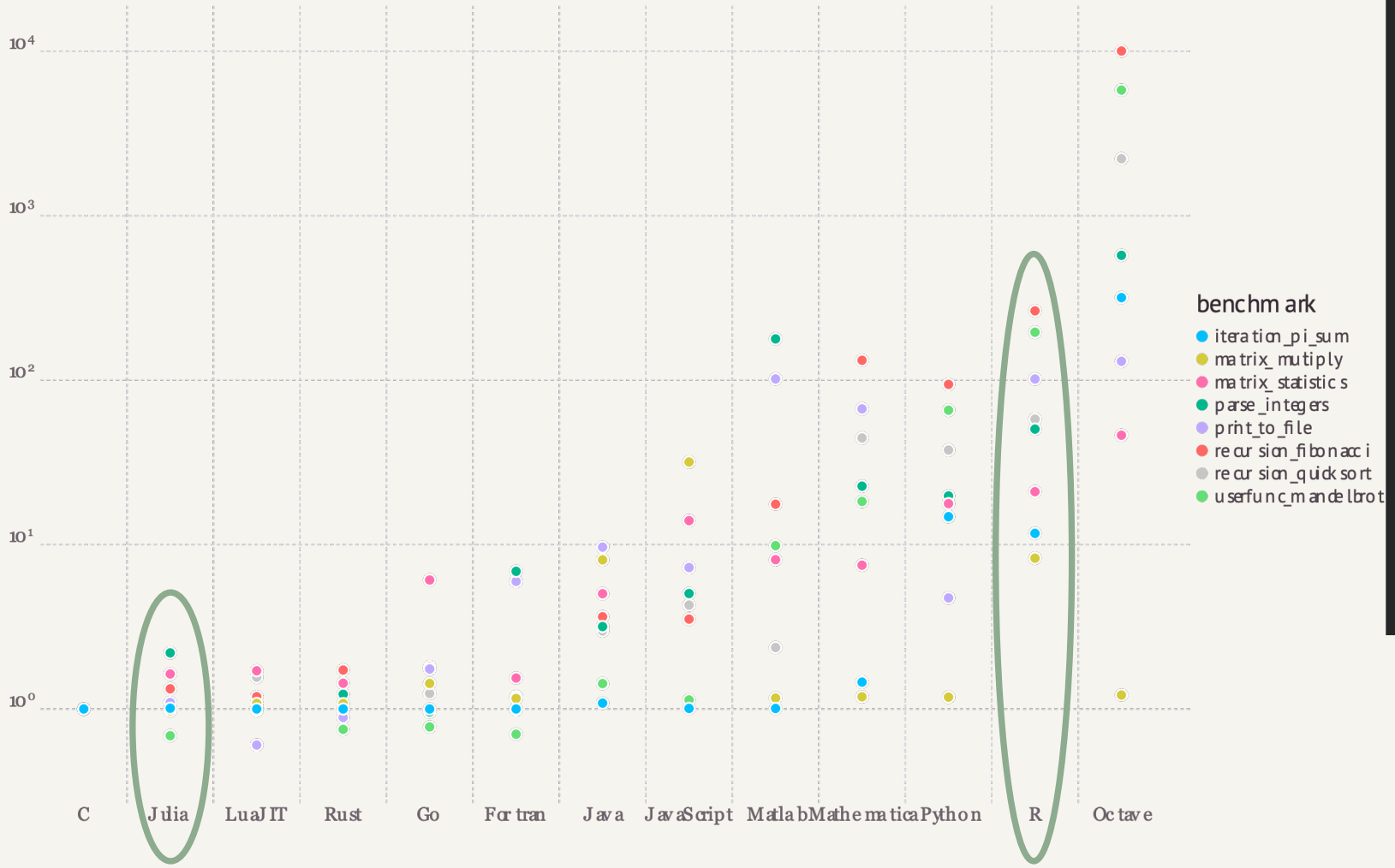


"These micro-benchmarks, while not comprehensive, do test compiler performance on a range of common code patterns, such as function calls, string parsing, sorting, numerical loops, random number generation, recursion, and array operations."
single core, Julia 1.0.0
https://julialang.org/benchmarks/

WHY JULIA?

- Gains in:
  - *Speed (but just-in-time compiler, i.e. package loading)*[1]
  - *Model complexity*
- Without sacrificing:
  - *Readability*
  - *Reproducibility*
  - *R packages that you know well*
  - *Tutorials and resources from the R community*
  - *Ability to share code with colleagues who don't use Julia*

1 : https://www.youtube.com/watch?v=FJeSa0Fr5VY



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WORKING WITH R IN JULIA

- Options:
  - *REPL*
  - *Julia script .jl*
  - *Julia Markdown .jmd*
  - *IDE like Visual Studio Code*
  - *Jupyter Notebooks .ipynb*
  - *Pluto Notebooks*