



LUNDS  
UNIVERSITET

# Course.jl - Introduction

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# Introduction

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What will we talk about today?

- How will the course be organized?
- What is julia?
- Why should you use it?
- Demo of Julia and standard libraries in Atom
- How to plot
- Where do you find documentation and help?



# Course info

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- 1 lecture per week
- Small homework each week

Help with the course and questions about julia:

<https://gitter.im/controljuliacourse/community>



# What is Julia?

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*The Julia Language: A fresh approach to technical computing.*

- Dynamically typed
  - Optionally typed
  - High-level language, simple syntax
  - Multiple dispatch
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- Version 0.1.0 Released Feb 2013
  - Version 1.0.0 Released Aug 2018



# Why use Julia?

Solves the dual-language problem. From `ThinkJulia.jl`:

*Julia is a unique programming language because it solves the so-called two languages problem. No other programming language is needed to write high-performance code. This does not mean it happens automatically. It is the responsibility of the programmer to optimize the code that forms a bottleneck but this can be done in Julia itself.*

- Open source and free: The whole language and all packages!
  - Possible to understand what is going on, Julia is written in Julia!
- Easy to get started
- Many third party libraries

● Julia 68.6%	● C 16.5%	● C++ 10.0%	● Scheme 3.3%	● Makefile 0.6%	● Shell 0.3%	● Other 0.7%
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# Fast!

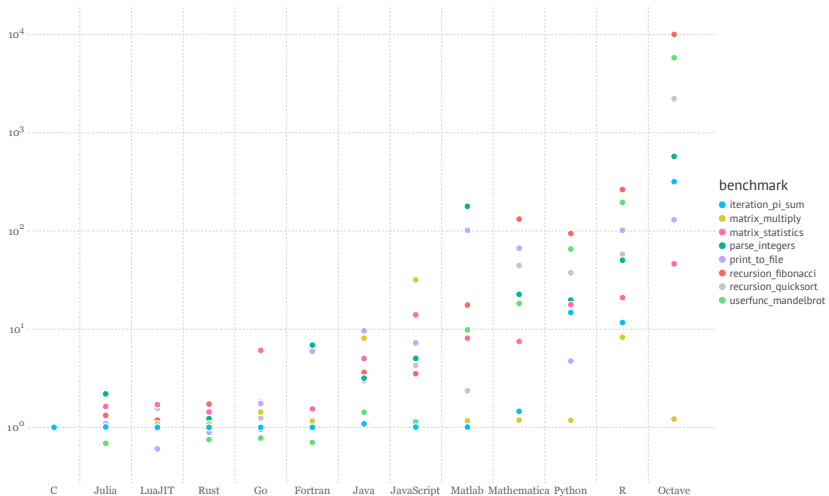


Figure: <https://julialang.org/benchmarks/>



## From this department

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- ControlSystems.jl
  - Mattias, Fredrik, Olof Troeng, others + you?
- EllZeroTrendFiltering.jl
  - Mattias, Olof Troeng
- ProximalOperators.jl
  - Mattias, Lorenzo Stella (KU Luven/Amazon), Niccolò Antonello (KU Luven)
- FirstOrderSolvers.jl (Under inactive development)
  - Mattias
- LabConnections.jl (at gitlab)
  - Mattias, Marcus TA, Marcus Greiff, Martin Karlsson
- LabProcesses.jl (and similar) (At gitlab)
  - Fredrik, Mattias, Martin Karlsson + others?



# From this department

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By Fredrik

- Robotlib.jl
- ControlSystemIdentification.jl
- TotalLeastSquares.jl
- LowLevelParticleFilters.jl
- LPVSpectral.jl
- DifferentialDynamicProgramming.jl
- DynamicMovementPrimitives.jl
- BasisFunctionExpansions.jl
- Hyperopt.jl
- + Several others