

AI Tools for R

Day 1 - Introduction to Data Analysis with R

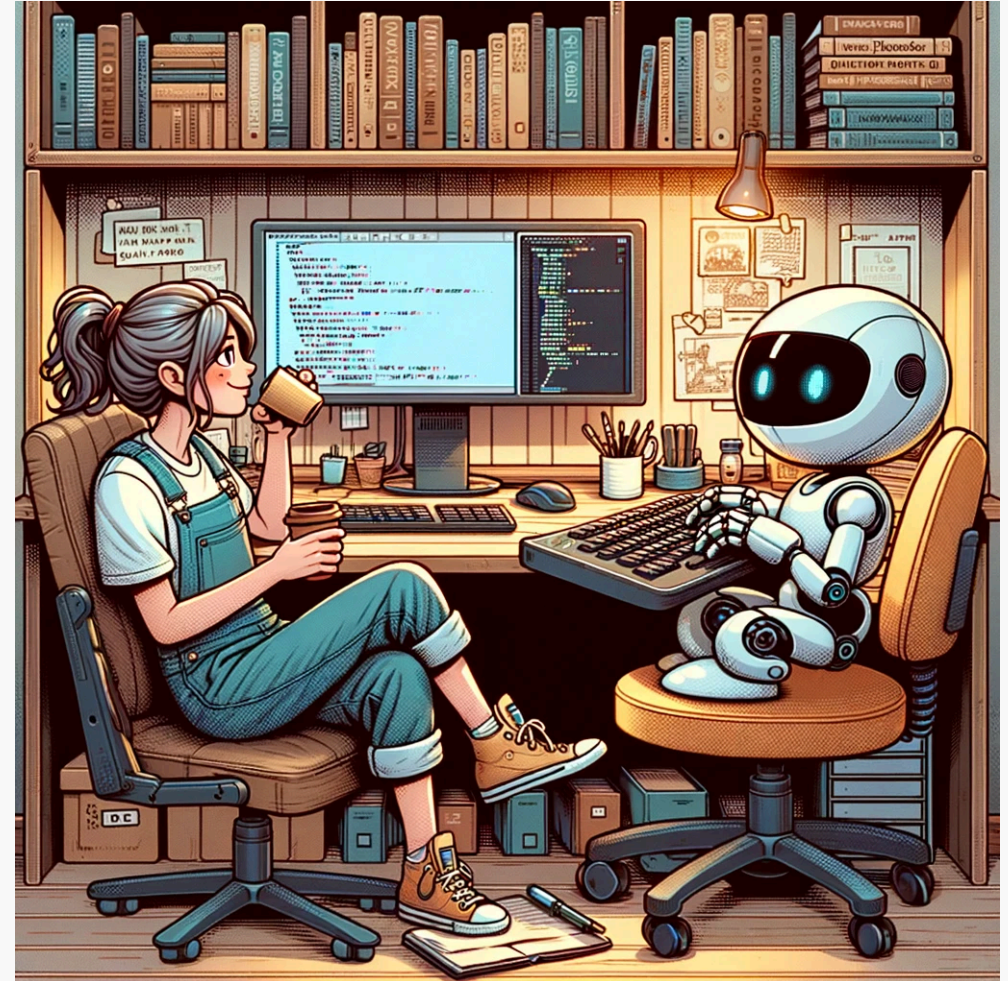
Selina Baldauf

Freie Universität Berlin - Theoretical Ecology

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Motivation

- AI tools assist programmers with
 - Coding
 - Debugging
 - Learning
 - ...
- Higher productivity and efficiency
- More motivation
- But careful: You still need to understand what's going on!



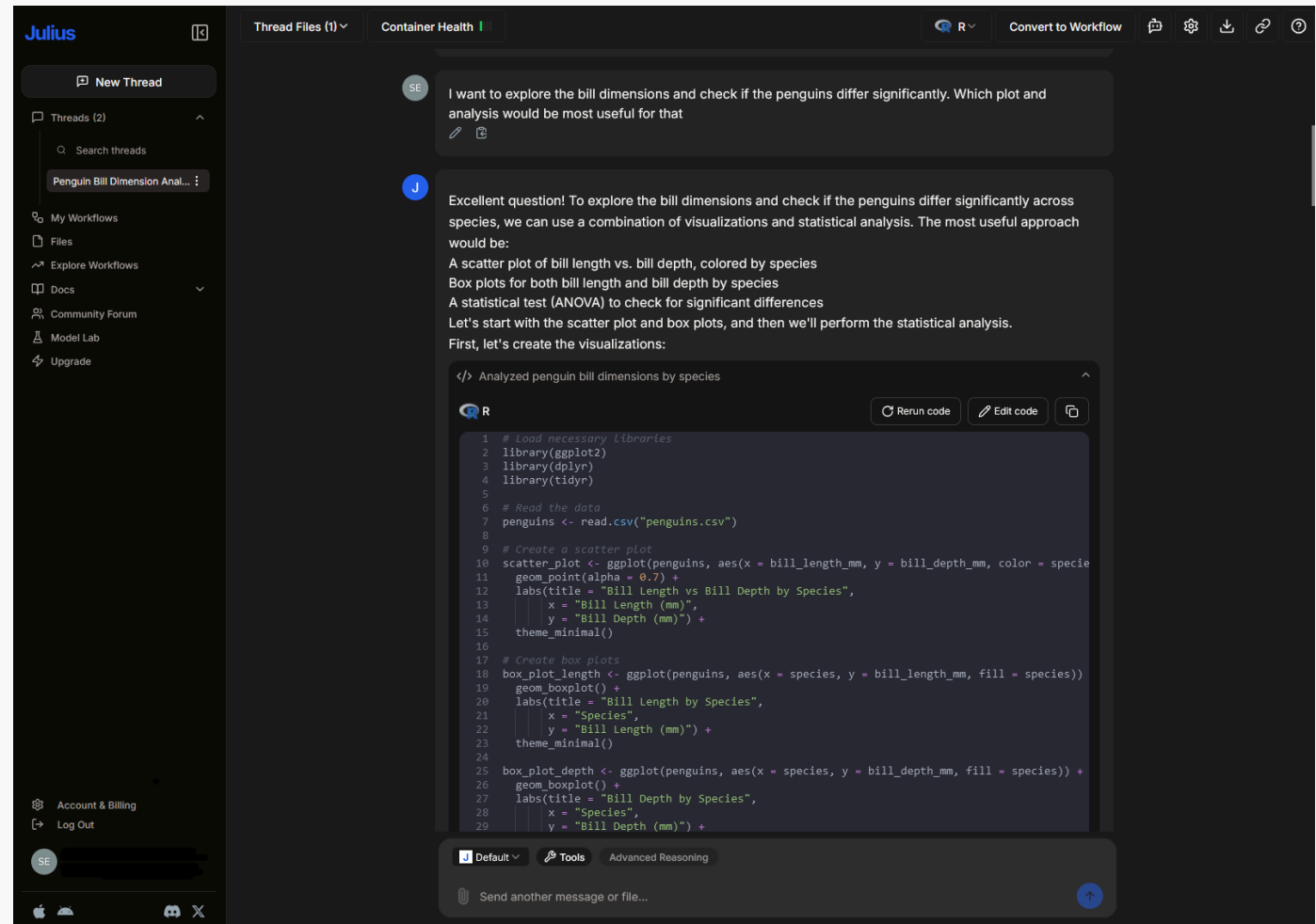
Overview of tools

- Browser-based chat bots ([ChatGPT](#), [Claude](#), ...)
 - General-purpose
- Data-analysis tools ([Julius AI](#), [RTutor](#), ...)
 - Upload data and ask questions about it
 - Can also execute code
 - Chat with your data
- Integrated AI tools ([GitHub Copilot](#), ...)
 - Integrated directly in programming environment
 - Real-time suggestions, chat, debugging, ...

Find the tools that best fit your workflow!

Julius AI

- <https://julius.ai/>
- Try for free
- Basic plan ~20€ per months (-50% academic discount)
- Upload data and ask questions about it



Github Copilot

- <https://github.com/features/copilot>
- Based on models specifically trained on source code
- Basic idea: Integrate directly into your IDE
 - Real-time code suggestions (inline as you type)
 - Chat with the AI
- Works best for well-represented languages (Python, JS, ...), but R is also pretty good

Inline code suggestions

Available for RStudio and Positron

- Copilot tries to predict what you want to do next
- Suggestions are based on the context
 - Previous code
 - Comments
 - Variable and function names
 - ...

```
fibonacci.R > fibonacci
1  fibonacci <- function(n) {
2    if (n == 0) {
3      return(0)
4    } else if (n == 1) {
5      return(1)
6    } else {
7      return(fibonacci(n - 1) + fibonacci(n - 2))
8    }
9  }
```

Get better suggestions

- **Provide context**
 - Open other files
 - Add top level comments explaining the purpose of the script
 - Name variables and functions properly
 - Copy-paste sample code and delete it later
- **Be consistent**
 - “Garbage in, garbage out”
 - Have a nice and consistent coding style

Nice side effect of using Copilot: More good-practice coding

Chat with GH Copilot about your

Only available in Positron or VS Code

- Open a chat window
- The AI can access your files and projects
- The AI can make tailored suggestions based on your project
- Great for
 - Debugging
 - Getting explanations
 - Getting good-practice suggestions
 - ...

How to get GitHub Copilot

See [this website](#) for step-by-step guide and more information.

It's really easy, but you need:

- GitHub Account
- Active GH Copilot subscription (10\$ per month)
 - Get it for free as an academic with an educational account
- IDE that supports Copilot

Things to consider I

- Privacy

- Check privacy guidelines before you use tools (e.g. [Github](#) -> [Settings](#) -> [Copilot](#) -> [Policies](#))

- Plagiarism

- Block suggestions matching public code ([Github](#) -> [Settings](#) -> [Copilot](#) -> [Policies](#))

Things to consider II

- Responsibility
 - You are responsible for your scientific output
 - Stay critical, double-check
- Transparency
 - Make clear for which tasks you used which AI
- Know relevant guidelines
 - Journals
 - Your university
- Still understand what is happening!