QuantNet 2.0 @ GitHub

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Outline

Reversible Jump Markov Chain Monte Carlo

Modern Scientific Practice

GitHub and QuantNet 2.0

GitHub

Demonstration

Reversible Jump MCMC

Standard practice for approximation of posterior distributions for model parameters: Metropolis-Hastings samplers

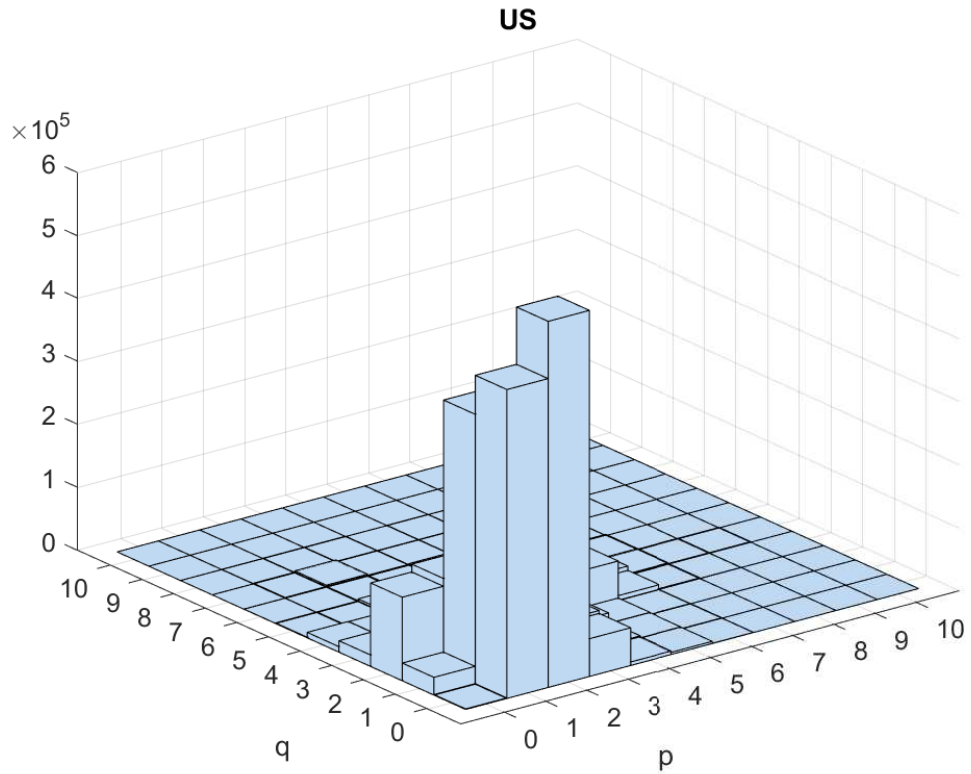
Problem: Want to analyze posterior distribution also spanning model space
$\Rightarrow$ Dimensionality of parameter space varies

Solution: Reversible Jump Markov Chain Monte Carlo

- Generalization of Metropolis-Hastings samplers
- Samples from a joint posterior distribution across different models and their corresponding parameter spaces

Posterior Distribution Across Models

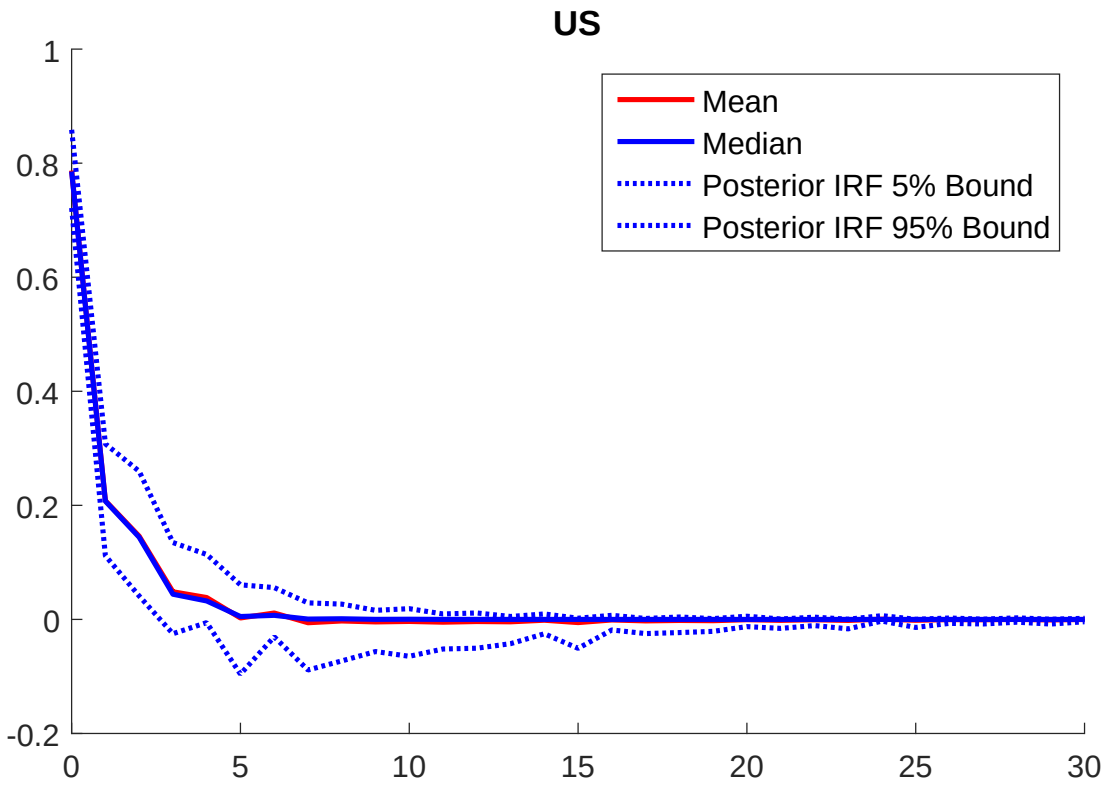
Posterior distribution across ARMA(p,q) models:



⇒ Posterior model probabilities

Posterior Distribution: Impulse Responses

Can analyze posterior distribution for any statistic while accounting for model uncertainty!



Modern Scientific Practice

Modern scientific practice:

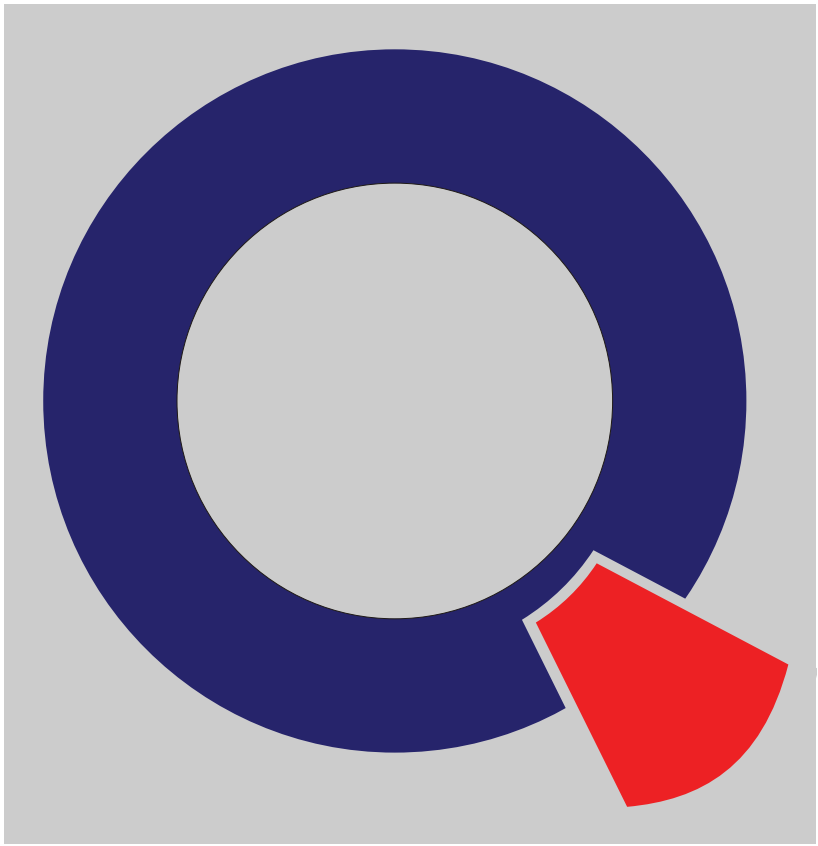
- Transparency
- Reproducibility

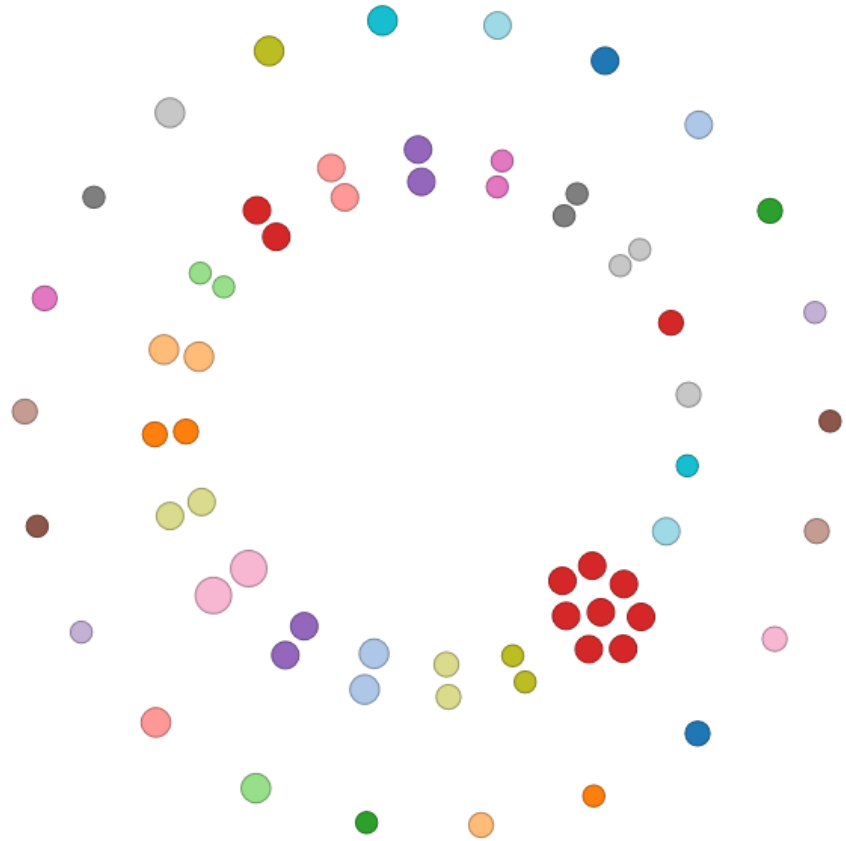
Also: Want to publicize new technologies!

Problem: Need and want to publish our technologies and data!

The Solution

QuantNet 2.0





The Solution

QuantNet 2.0 - The Next Generation

- $\approx$ 2000 Quantlets
- Technology to easily share data and programs
- Searchable technology
- Enabled collaboration via seamless GitHub integration
- Connections between technologies

Boosting transparent and reproducible science

What is GitHub?

- A distributed version control system (Git)
- A collaboration platform (Hub)

Advantages of QuantNet 2.0

- Fully integrated with GitHub
- Proprietary GitHub-R-API developed from core package (Arizona State University)
- Ease of discovery and use of your technology
- Audit of your technology

Reversible Jump Markov Chain Monte Carlo

Modern Scientific Practice

GitHub and QuantNet 2.0

GitHub

Demonstration

What I did

1. **Start:** Create GitHub repository with own code
2. **Develop:** Develop according to style guide
3. **Publish:** Audit and publish

Your Technology: Easily found, used, and improved!

Interactive D3 Visualization

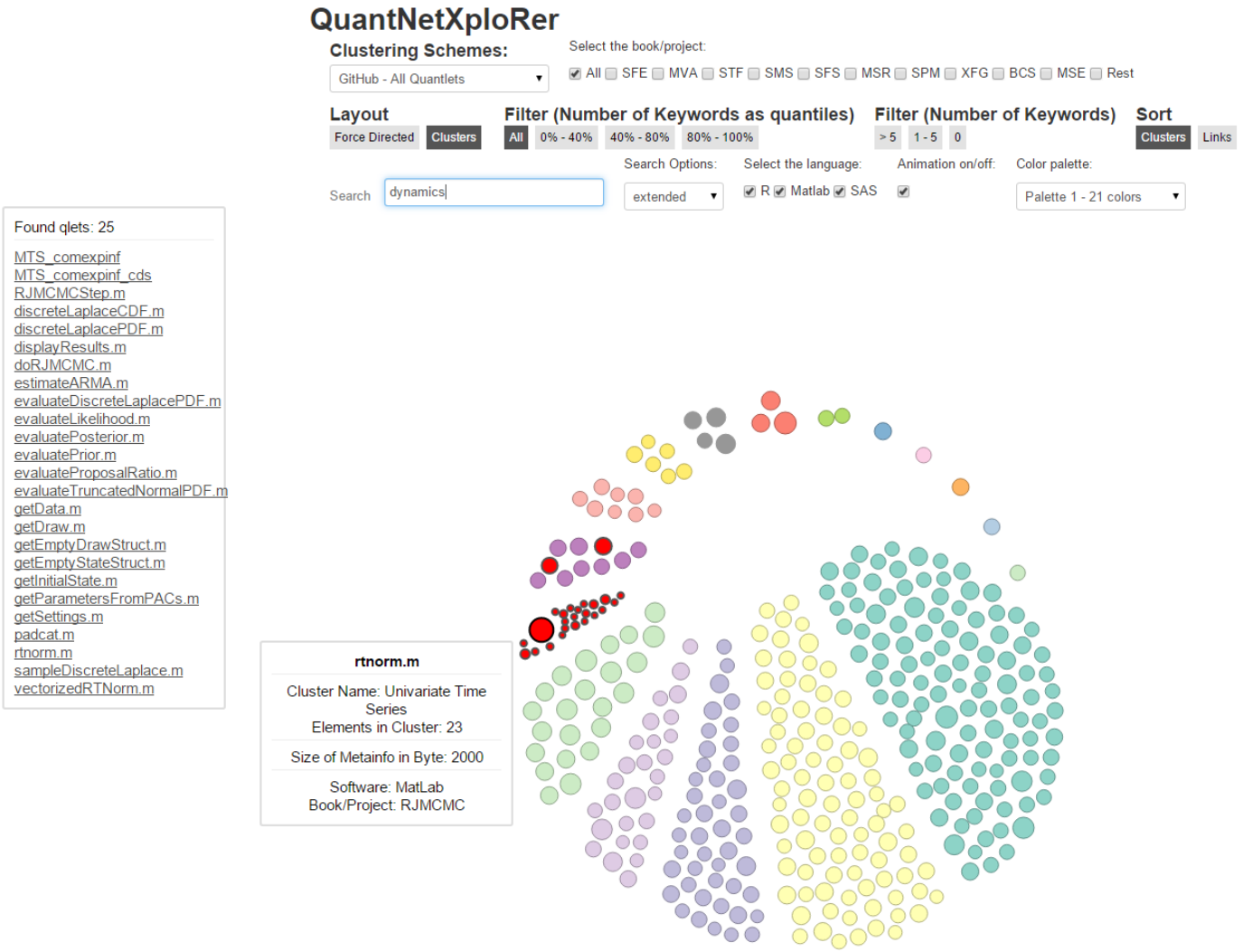


Figure 1. All Quantlets from GitHub in QuantNetXploRer, search term “dynamics“

Collaboration Timeline via GitHub-API

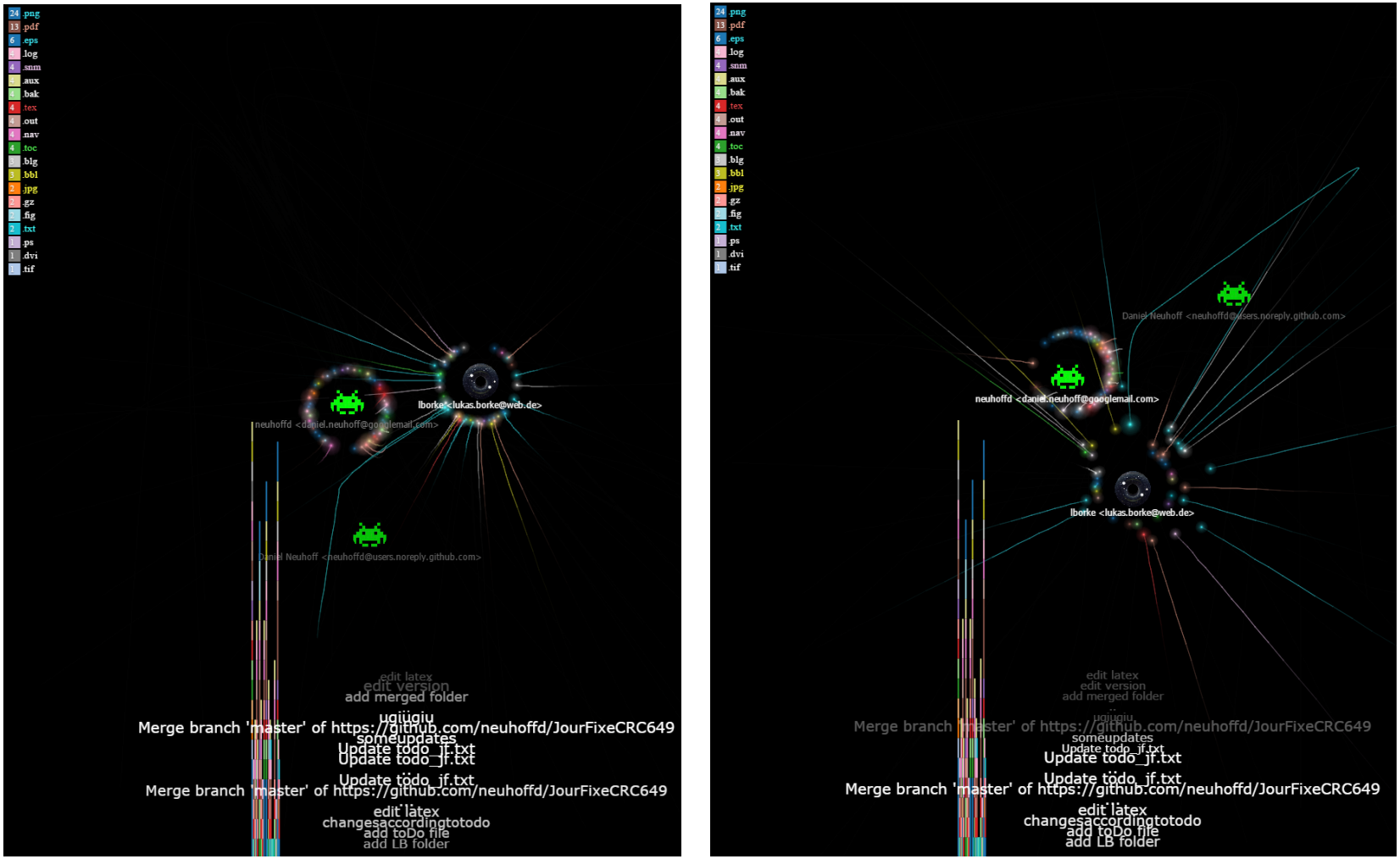


Figure 2. Snapshots of the development of this presentation

More examples of collaboration projects

Thank you for your attention!