

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

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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

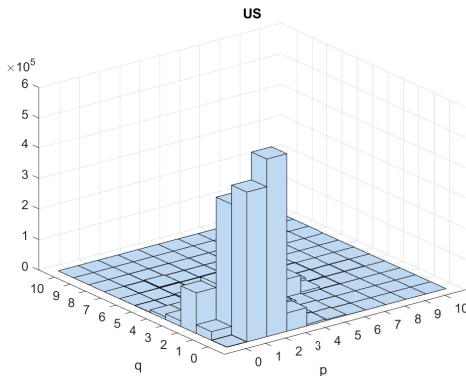
⇒ Dimensionality of parameter space varies

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

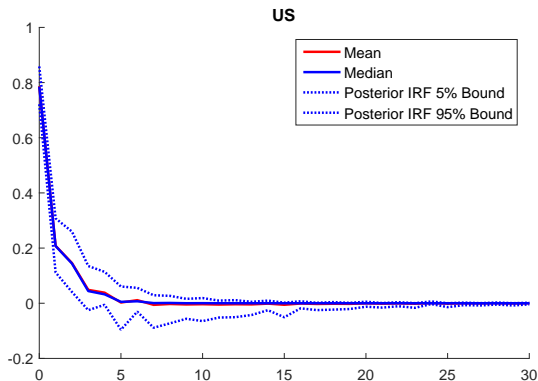
Posterior distribution across ARMA(p,q) models:



\Rightarrow Posterior model probabilities

Posterior Distribution: Impulse Responses

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



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Modern scientific practice:

- ▶ Transparency
- ▶ Reproducibility

Also: Want to publicize new technologies!

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

Reversible Jump Markov Chain Monte Carlo

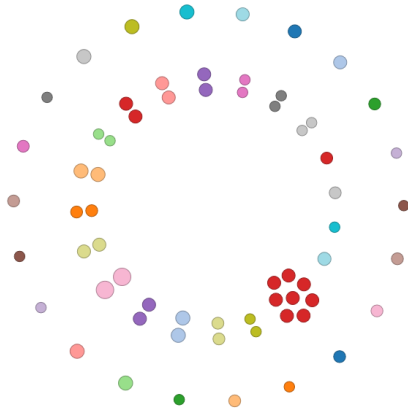
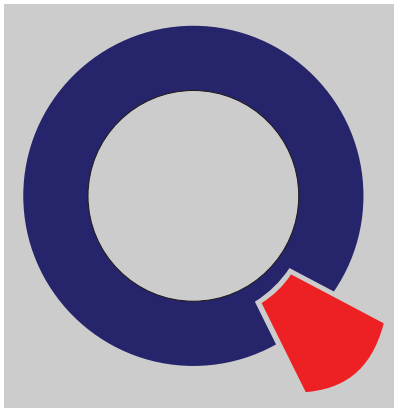
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QuantNet 2.0



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

Reversible Jump Markov Chain Monte Carlo

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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

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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

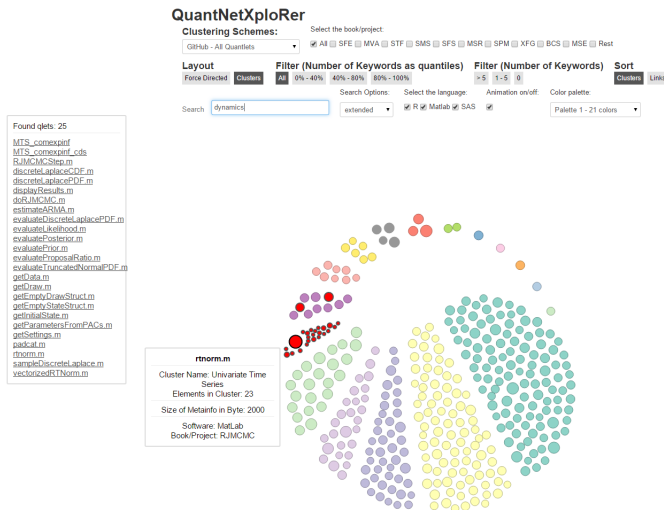


Figure 1. All Quantlets from GitHub in QuantNetXploRer, search term “dynamics”

Thank you for your attention!