White Papers

Technical reports, methodological frameworks, and research workflows

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## 1 Research Methodology & Workflows

### 1.1 [Mac Workflow for Tracking Daily Research Progress](../../posts/research_management/)

A comprehensive framework for organizing research activities, maintaining progress logs, and implementing version control for academic projects.

Research management Workflow automation Version control Academic productivity

[🔗 Full Report](../../posts/research_management/) • [📄 PDF](../../posts/research_management/index.pdf)

### 1.2 [Setting Up a Comprehensive Research Backup System on macOS](../../posts/research_backup_system_p32/)

Technical specification for implementing a multi-layered backup strategy for research data, ensuring redundancy and security across local and cloud storage systems.

Data management Backup systems macOS Research infrastructure

[🔗 Full Report](../../posts/research_backup_system_p32/) • [📄 PDF](../../posts/research_backup_system_p32/index.pdf)

## 2 Statistical Computing & Development

### 2.1 [RCT Validation Language](../../posts/rct_validation_lang/)

Specification for a domain-specific programming language designed to capture clinical trial database validation logic, with compilation targets for Lua and JavaScript.

Clinical trials Programming languages Data validation DSL design

[🔗 Full Report](../../posts/rct_validation_lang/) • [📄 PDF](../../posts/rct_validation_lang/index.pdf)

### 2.2 [Setting up an R Development Environment on GitHub](../../posts/develop_r_package/)

Best practices and step-by-step methodology for establishing reproducible R package development workflows using GitHub integration and continuous integration.

R development GitHub Package development CI/CD

[🔗 Full Report](../../posts/develop_r_package/) • [📄 PDF](../../posts/develop_r_package/index.pdf)

## 3 Data Science Applications

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Evaluation framework and practical guidelines for integrating large language models into data science workflows, including prompt engineering and quality assessment.

AI tools Data science LLM integration Prompt engineering

[🔗 Full Report](../../posts/chatbots_in_stats/) • [📄 PDF](../../posts/chatbots_in_stats/index.pdf)

### 3.2 [Minimalist EDC Application Framework](../../posts/minimalist_edc_app/)

Technical architecture for building lightweight electronic data capture systems for clinical research, emphasizing simplicity and regulatory compliance.

EDC systems Clinical research Software architecture Regulatory compliance

[🔗 Full Report](../../posts/minimalist_edc_app/) • [📄 PDF](../../posts/minimalist_edc_app/index.pdf)

## 4 Technical Infrastructure

### 4.1 [Containerized R Analysis Workflows with Docker](../../posts/share_R_code_via_docker_p25/)

Implementation guide for reproducible R analysis environments using Docker containerization, including best practices for sharing and deployment.

Docker Reproducibility R environment Containerization

[🔗 Full Report](../../posts/share_R_code_via_docker_p25/) • [📄 PDF](../../posts/share_R_code_via_docker_p25/index.pdf)

### 4.2 [AWS Server Configuration for Research Computing](../../posts/server_setup_aws_cli/)

Comprehensive guide for setting up and configuring AWS instances for statistical computing and research data analysis.

AWS Cloud computing Server configuration Research computing

[🔗 Full Report](../../posts/server_setup_aws_cli/) • [📄 PDF](../../posts/server_setup_aws_cli/index.pdf)

*These white papers represent in-depth technical analyses, methodological frameworks, and implementation guides developed for research and statistical computing applications. Each document provides detailed specifications, best practices, and reproducible workflows.*