Paper Validation Report for DS2025_diff

Correspondence: Yes
Percentages: 95.0%

Conclusion:

The repository code demonstrates a high degree of compliance with the experimental procedures described in the paper. All key differentiation methods (finite difference, polynomial, spectral, total variation, adaptive, inverse), symbolic regression approaches (EPDE, SINDy), datasets (second-order ODE, Burgers', KdV, Laplace, Wave equations), and noise addition strategies are present in the codebase. The workflow—generating (or loading) data, applying multiple differentiation schemes, running equation discovery multiple times, evaluating with metrics like Structural Hamming Distance (SHD), analyzing coefficient variability, and generating boxplots/statistics—faithfully matches the paper's described experiments. Figures, tables, and confidence intervals mentioned in the paper are clearly supported by implemented plotting, statistical analysis, and result export routines. The primary reason for not awarding a full 100% score is the absence (in the code descriptions) of explicit top-level scripts for completely automating experiment repetitions (e.g., for all datasets/noise/method combinations) as described, or potential lack of fully detailed configuration for reproducing all listed tables. Nonetheless, with the provided code, results are highly reproducible and the correspondence substantial.