

1 SciTeX Writer: A Container-Based Framework for 2 Reproducible Scientific Manuscript Preparation

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7 Introduction

8 We thank the Editor and Reviewers for their thoughtful and constructive
9 feedback on our manuscript describing the SciTeX Writer framework. Their
10 comments have significantly strengthened both the technical content and the
11 clarity of our presentation. We have carefully addressed each point raised
12 during the review process and believe the revised manuscript provides a more
13 comprehensive and accessible description of the framework's capabilities.

14 *Original comments from the editor and reviewers are presented in gray*
15 *italicized text.*

16 Our responses to these comments are shown in blue text.

17 Changes made to the manuscript text are highlighted using latexdiff
18 formatting, with additions shown in blue and ~~deletions shown in red with~~
19 ~~striketrough~~.

20 This response document demonstrates one of the key features of Sci-
21 TeX Writer: the structured organization of revision materials. Each re-
22 viewer's comments and our corresponding responses are maintained in sepa-
23 rate, version-controlled files that are automatically compiled into this com-
24 prehensive response letter. The integration with latexdiff enables automatic

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25 generation of marked-up manuscripts showing precisely where changes were
26 made. This systematic approach ensures that all reviewer concerns are ad-
27 dressed and documented in a format that facilitates editorial review.

28 *Editor Comment 1*

29 *The manuscript presents an interesting framework for scientific manuscript*
30 *preparation. However, the reviewers have raised several important points re-*
31 *garding performance benchmarks, comparison with existing solutions, and*
32 *accessibility for researchers without extensive technical backgrounds. Please*
33 *address these concerns in your revision and provide additional validation data*
34 *as suggested by the reviewers.*

35 *Response to Editor Comment 1*

36 We thank the Editor for this helpful summary. We have carefully ad-
37 dressed all reviewer concerns through the following revisions:

38 1) Added comprehensive performance benchmarks in the Supplementary
39 Results section, including compilation times across different system configu-
40 rations and scalability analysis with varying document sizes.

41 2) Expanded the Discussion section to include detailed comparison with
42 existing solutions (Overleaf, traditional LaTeX installations, and template
43 repositories), clearly articulating the distinct advantages of our containerized
44 approach.

45 3) Acknowledged the learning curve for command-line interfaces in the
46 Limitations section and proposed future directions including optional graph-
47 ical interfaces and expanded documentation for LaTeX newcomers.

48 4) Provided cross-platform validation results demonstrating byte-for-byte
49 reproducibility across six different operating systems and two processor ar-
50 chitectures.

51 These additions strengthen the manuscript by providing quantitative val-
52 idation and addressing accessibility concerns while maintaining focus on the
53 framework’s core contributions.

54 *Reviewer 1, Comment 1*

55 *The manuscript describes an interesting approach to scientific manuscript*
56 *preparation using containerization. However, I am concerned about the com-*
57 *putational overhead introduced by container startup times. The authors should*
58 *provide detailed performance benchmarks comparing compilation times with*
59 *and without containerization, across different document sizes and system con-*
60 *figurations. Without this quantitative data, it is difficult to assess whether*
61 *the reproducibility benefits outweigh the performance costs.*

62 *Response to Reviewer 1, Comment 1*

63 We thank the reviewer for this important point. We have added a com-
64 prehensive “Compilation Performance Benchmarks” subsection to the Sup-
65plementary Results that directly addresses this concern.

66 Our benchmarking revealed that container startup overhead adds approx-
67 imately 2 seconds to each compilation cycle on our reference system (16 GB
68 RAM, 8 cores). For a typical manuscript, total compilation time is 12 seconds
69 for initial builds and 4 seconds for incremental builds. While this represents
70 a measurable overhead compared to native LaTeX compilation, we argue
71 that this cost is negligible in the context of typical writing workflows where
72 authors compile documents infrequently (every few minutes at most).

73 More importantly, the reproducibility benefits become evident when con-
74 sidering the time lost to debugging environment-specific compilation failures
75 in collaborative settings. Our own experience and informal surveys of col-
76 leagues suggest that researchers commonly spend 30-60 minutes resolving
77 package version conflicts when collaborating across different systems. The 2-
78 second container overhead is trivial compared to these multi-hour debugging
79 sessions.

80 We have added this cost-benefit analysis to the Discussion section to
81 help readers understand that while containerization introduces measurable
82 overhead, the reproducibility benefits provide substantial time savings in
83 collaborative workflows. We appreciate the reviewer prompting us to make
84 this trade-off explicit.

85 The container-based compilation system represents a significant departure
86 from traditional LaTeX workflows and offers substantial practical benefits.
87 By encapsulating the entire compilation environment, the framework
88 eliminates the common scenario where manuscripts compile successfully on
89 one author’s machine but fail on collaborators’ systems due to package version
90 differences.

91 Our benchmarking revealed that container startup overhead adds approximately
92 2 seconds to each compilation cycle on our reference system (16 GB RAM,
93 8 cores). For a typical manuscript, total compilation time is 12 seconds for
94 initial builds and 4 seconds for incremental builds. While this represents
95 a measurable overhead compared to native LaTeX compilation, this cost is
96 negligible in the context of typical writing workflows where authors compile
97 documents infrequently.

98 More importantly, the reproducibility benefits become evident when considering
99 the time lost to debugging environment-specific compilation failures. The
100 2-second container overhead is trivial compared to the 30-60 minutes researchers
101 commonly spend resolving package version conflicts when collaborating across
102 different systems.

103 This reproducibility becomes increasingly important as research teams
104 become more distributed and as long-term document maintenance requires
105 compilation environments to remain stable over years.

106 *Reviewer 2, Comment 1*

107 *The manuscript would benefit from a more thorough comparison with*
108 *Overleaf, which already provides reproducible LaTeX compilation environments.*
109 *The authors mention Overleaf briefly but do not clearly articulate*
110 *what advantages their containerized approach offers over this established cloud-*
111 *based platform. Additionally, the manuscript does not address accessibility*
112 *for researchers who may not be comfortable with command-line interfaces and*
113 *containerization technologies. This could limit adoption of the framework.*

114 *Response to Reviewer 2, Comment 1*

115 We appreciate these thoughtful observations. We have substantially ex-
116 panded the “Comparison with Existing Solutions” subsection in the Discus-
117 sion to provide a more detailed analysis of how SciTeX Writer differs from
118 Overleaf.

119 The key distinctions are: (1) SciTeX Writer operates entirely on local sys-
120 tems or institutional computing infrastructure, eliminating dependency on in-
121 ternet connectivity and addressing concerns about sensitive research data on
122 cloud platforms; (2) the framework provides complete control over the com-
123 pilation environment through transparent, modifiable container definitions
124 rather than a proprietary compilation service; (3) the modular file structure
125 and automated asset management go beyond what Overleaf provides, ac-
126 tively preventing merge conflicts and automating figure/table preprocessing;
127 and (4) the system integrates seamlessly with existing Git workflows and
128 institutional HPC resources that often prohibit cloud services.

129 Regarding accessibility, we acknowledge this is a valid limitation. We
130 have added discussion of this concern in the “Limitations and Consider-
131 ations” subsection, explicitly noting that the command-line interface may
132 present a learning curve for some researchers. We have also proposed future
133 development directions including optional graphical interfaces and expanded
134 documentation for LaTeX newcomers. However, we note that our target
135 audience includes researchers already using or willing to learn Git for ver-
136 sion control, a group that increasingly represents the norm in computational
137 research fields.

138 We have also clarified in the Introduction that SciTeX Writer is positioned
139 as a complementary tool rather than a universal replacement for existing
140 solutions. Different research workflows have different requirements, and we
141 now better articulate the specific use cases where our framework provides the
142 greatest value.

143 Compared to cloud-based platforms like Overleaf, SciTeX Writer offers
144 greater control over the compilation environment and eliminates dependency

145 on internet connectivity, which can be crucial for researchers working in
146 bandwidth-limited environments or on sensitive projects requiring air-gapped
147 systems. Unlike simple template repositories, the framework provides active
148 workflow automation through Makefiles and preprocessing scripts rather than
149 merely offering formatting guidelines. The system complements rather than
150 replaces Git-based workflows, adding a layer of manuscript-specific tooling
151 while maintaining compatibility with standard version control practices.

152 The key distinctions from Overleaf are: (1) SciTeX Writer operates entirely
153 on local systems or institutional computing infrastructure, addressing concerns
154 about sensitive research data on cloud platforms; (2) the framework provides
155 complete control over the compilation environment through transparent,
156 modifiable container definitions rather than a proprietary compilation service;
157 (3) the modular file structure and automated asset management go beyond
158 what Overleaf provides, actively preventing merge conflicts and automating
159 figure/table preprocessing; and (4) the system integrates seamlessly with
160 existing Git workflows and institutional HPC resources that often prohibit
161 cloud services.

162 Where other solutions address individual aspects of the manuscript prepa-
163 ration challenge, SciTeX Writer integrates multiple components into a unified
164 system.

165 The framework requires users to have basic familiarity with command-line
166 interfaces and Makefiles, which may present a learning curve for researchers
167 accustomed to graphical editing environments. ~~While the system automates~~
168 ~~many aspects of document preparation, it remains a LaTeX-based solution~~
169 ~~and therefore inherits both the power and complexity of the underlying~~
170 ~~typesetting system.~~ The containerization approach requires Docker or Singularity
171 installation, adding a dependency that, while increasingly common in research
172 computing environments, may not be universally available. The framework is
173 optimized for scientific articles following conventional IMRAD structure and
174 may require adaptation for other document types such as books or technical
175 reports. Future development could address these limitations through optional

graphical interfaces, expanded documentation for LaTeX newcomers, and
templates adapted for diverse document formats.

Conclusion

We sincerely appreciate the time and expertise that the Editor and Reviewers devoted to evaluating our manuscript. Their insightful comments have led to substantial improvements in both the technical documentation and the clarity of our presentation. The revision process has strengthened the manuscript's contribution by prompting us to provide additional validation results, clarify implementation details, and better articulate the framework's advantages for collaborative scientific writing.

All concerns raised during the initial review have been addressed through revisions to the manuscript text, addition of supplementary materials, and clarification of technical specifications. We believe the revised manuscript now provides researchers with a clear understanding of how SciTeX Writer can streamline their manuscript preparation workflow while ensuring reproducibility across diverse computing environments.

Appropriately, this revision letter itself was generated using the SciTeX Writer framework, demonstrating the system's practical utility for managing the peer review process. The structured organization of reviewer comments and author responses, combined with automatic generation of marked-up manuscripts, exemplifies the workflow efficiencies that the framework provides.

We look forward to your decision on the revised manuscript and remain available to address any additional questions or concerns.

Sincerely,

The SciTeX Writer Development Team