# Proposal Status | MAIN

**Organization:** University of Alabama Tuscaloosa

## Review #3

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| **Proposal Number:** | 1629871 |
| **NSF Program:** | COMPUTING RES INFRASTRUCTURE |
| **Principal Investigator:** | Carver, Jeffrey C |
| **Proposal Title:** | CINew: Advanced Systematic Literature Review Authoring Infrastructure for Software Engineering |
| **Rating:** | Excellent |

## REVIEW:

In the context of the five review elements, please
evaluate the strengths and weaknesses of the proposal with respect to intellectual merit.

Description of project (short):

The project plans to develop the Systematic Literature Review Authoring Infrastructure and Toolkit for Software Engineering (SAInT), designed to help software engineering researchers do systematic literature reviews (SLRs). SLRs are important to advancing scientific understanding, but currently are needlessly difficult to do. The proposed project will provide much-need automation to the task.

Strengths:

- The proposed infrastructure has a substantial ability to advanced knowledge and understanding within software engineering by reducing the effort and increasing the quality of systematic literature reviews.
- The activities explore original concepts, as shown in the PIs' review of existing tools for SLRs. This explains the novelty of the approach.
- The plan for creating the infrastructure is outstanding; it's well-reasoned, sufficiently ambitious yet achievable, and builds on existing technologies rather than competes with them. Each step along the way is backed by sound rationale drawn from empirical studies, other fields of science, and the community's support. The system is designed based on empirically-grounded principles.
- The team performing the research is exceptionally well qualified for several reasons. First, they have been leaders in the field or SLRs in software engineering. Second, the team is built from multidisciplinary scholars with complementary skills. Third, the team demonstrated high competence in their previous CRI-P proposal to obtain ideal results that strongly attest to their motivation and dedication to this infrastructure. Fourth, the team has made the the necessary contacts with key infrastructure leaders (namely ACM and IEEE) which further increases the probability of success.
- The team has adequate resources to complete the work.

Weaknesses:
- The proposal did not make a strong case for why SLRs are important in software engineering. The proposal states that because empirical studies are frequent in software engineering, SLRs are well suited, but frequency is not a sufficient condition for suitability. SLRs may work well in the medical domain where results are obtained systematically and through replication, but research in empirical software engineering may not be mature enough for SLRs to be fruitful. Nonetheless, the proposal did make some good points for why SLRs are useful; I especially liked the one about helping students understand the methods used in their area of research. Certainly the PIs make the case convincingly that there's an increase interest in SLRs and many SLRs have been done, but I would suggest that the PIs make a stronger case for what positive outcomes SLRs have brought to software engineering so far. What research has SLRs suggested that we probably wouldn't have done anyway?
- The proposed infrastructure does not, apparently, target Google scholar, a major source of data for SLRs. The infrastructure would benefit significantly if it were included.

Constructive suggestions for improvement
- Make a stronger case for what positive outcomes SLRs have brought to software engineering so far
- Describe how the system will be deployed (online, desktop, mix?)
- Explicitly state what parts will be open sourced and what ones won't, and under what license.

- Describe how PhD students working on project will make research progress.
- Describe why Google scholar won't be included; or better yet, include it.

In the context of the five review elements, please
evaluate the strengths and weaknesses of the proposal with respect to broader impacts.

Strengths:
- The proposal has a substantial ability to benefit society by enabling faster-advancing research in software engineering.
- The PIs are well positioned to take this infrastructure beyond software engineering. It should start in software engineering because it's the community most qualified to build it. And it can expand because SLRs are useful in a wide variety of sciences.
- PhD students will be able to make more progress on their dissertations by spending less time on SLRs
- The increase in SLRs can inform new research in practice
- SLRs may become accessible to a broader audience.

Weaknesses:
- It's unclear what research the graduate students working on this project will do, which is critical to their PhDs. One could imagine a SLR methodology-centered dissertation, but this may reduce the student's chances of landing a job in computer science academia and probably wouldn't be terribly useful for a job in industry.

Please evaluate the strengths and
weaknesses of the proposal with respect to any additional solicitation-specific review criteria, if
applicable

Does the proposal provide convincing evidence that the research infrastructure will result in compelling new research and education opportunities?
Yes.

How well does the proposed research focus fit with CISE core disciplines? Are CISE researchers involved in an integral way, particularly in leadership positions?
Yes. The proposal is backed by extensive CISE researcher input.

Does the proposal provide convincing evidence that a diverse community of users plans to use the capabilities provided?
Yes.

Is there existing similar infrastructure that is available to the community? How is this infrastructure different and is development of the new infrastructure or enhancement of the existing infrastructure justified with respect to other existing infrastructure available to the community?
There is some existing infrastructure, some of which will be included in this infrastructure, but none that does what this one does.

Have the PIs convincingly demonstrated that the project team has the skills necessary to acquire, develop, and/or operate community research infrastructure so as to provide a high level of service and support for a broadly-based community of users?
Yes.

Is the project management plan, including timeline, costs, and personnel, realistic?
The management plan is very well reasoned.

To what extent does the proposal convincingly describe the means by which user satisfaction will be evaluated and used to refine and improve subsequent infrastructure services and operations?
Yes, the proposed project has both formative and summative evaluations.

Summary Statement

The well-qualified PIs propose a novel infrastructure that will accelerate empirical software engineering. The infrastructure is designed based on extensive input from the community and will benefit a wide variety of stakeholders.

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