

PUBLIC SUBMISSION

Received: May 29, 2025
Tracking No. nb9-zc4q-s5nr
Comments Due: May 28,
2025 **Submission Type:** Web

Docket: NSF-2025-OGC-0001
NITRD_FRDOC_0001

Comment On: NSF-2025-OGC-0001-0001

Request for Information: Development of a 2025 National Artificial Intelligence Research and Development Strategic Plan

Document: NSF-2025-OGC-0001-DRAFT-0292

Comment on FR Doc # 2025-07332

Submitter Information

Organization: US Research Software Engineer Association

General Comment

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1. Research Software Engineers Enable AI Leadership and Scientific Impact

The progress and application of AI depend heavily on the underlying software infrastructure. Research Software Engineers (RSEs) are responsible for building and maintaining this infrastructure, which spans modeling, simulation, data handling, and system integration. Their work ensures that AI research is reliable, reproducible, and scalable. Major scientific advances from new materials to pharmaceuticals are enabled through computer-aided modeling and simulation. The software driving these breakthroughs is developed by experts who often choose research careers not for financial reward, but for the opportunity to contribute to scientific discovery. These professionals are typically not principal investigators and rarely receive the same recognition or support. As a result, their roles remain undervalued and underfunded. We recommend that the 2025 National AI R&D Strategic Plan formally recognize Research Software Engineers (RSEs) as essential contributors to the advancement of AI. Dedicated, long-term funding and recognition of their work as central to scientific output are critical to sustaining innovation.

2. Strengthening National Competitiveness Through Strategic Investment in Technical Talent

Internationally, countries such as the United Kingdom and Germany have developed formal mechanisms to support RSE roles. These investments help attract and retain critical talent. Without similar structures, the U.S. risks losing ground in AI research and development. To stay competitive, the U.S. needs to treat RSEs as core contributors to scientific teams. That means building career paths, ensuring stable positions, and including RSEs as technical leads in federal funding frameworks. Recognizing software as a strategic asset, rather than an afterthought, is essential.

3. Increasing the Impact of Federal AI Research Investments

Many federally funded research efforts rely on software to produce results; however, this software is often not maintained beyond the life of the grant. Without proper support, reproducibility suffers and innovation slows. To improve the impact of AI research, the Plan should identify software as a primary research product. Pipelines, workflows, benchmarks, and models should be accompanied by sustainability plans and infrastructure to ensure long-term access. RSEs are essential to ensuring these products are functional, shareable, and reusable.

4. Developing Practical Skills to Meet National AI Needs

To support scalable AI systems, the U.S. needs a workforce equipped to develop and maintain them. This requires training in practical skills such as model deployment, reproducibility, and systems integration, areas where RSEs are already leading. The Plan should invest in training programs built around the real-world application of AI tools. This includes apprenticeships, internships, hackathons, and workshops designed and delivered by RSEs. These programs can rapidly train RSEs to meet national needs in scientific, security, and industrial domains.

5. Advancing AI Through Shared Infrastructure and Scalable Platforms

Collaborative platforms that provide compute, data, tools, and model integration are essential for scalable AI research. These platforms require thoughtful design, technical oversight, and maintenance, roles for which RSEs are well-equipped. Federal investment in shared AI infrastructure such as science gateways and federated platforms can enable greater research reuse and reduce redundant development. RSEs should be included in the leadership and governance of these systems from the outset to ensure they are robust, secure, and future-ready.

6. Conclusion

RSEs transform AI research into operational systems that can be reused, scaled, and sustained. Their contributions are central to maintaining U.S. leadership in AI, yet they remain underrecognized and unsupported. The 2025 National AI R&D Strategic Plan should address this by integrating RSE roles into workforce, funding, and infrastructure strategies. Doing so will strengthen the long-term impact

and competitiveness of the U.S. AI ecosystem.