MRI-R2 Consortium: Development of a Software Traceability Instrument to Facilitate and Empower Traceability Research and Technology Transfer

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1 PROJECT SUMMARY

Software traceability helps to assure that an as-built system correctly implements all requirements by supporting change impact assessment, re-engineering of applications, and other critical software engineering activities. Unfortunately, numerous case studies have highlighted the difficulties of implementing successful traceability processes. These difficulties have created a compelling research agenda that has led to new discoveries and advances which improve the reliability, safety, and security of IT systems at both the systems and software level. Despite such early successes, technology transfer is hampered by the lack of a shared research infrastructure. This project will therefore develop a software traceability instrument designed to empower future traceability research, through facilitating innovation and creativity, increasing collaboration between traceability researchers, decreasing the startup costs and effort of new traceability research projects, and fostering technology transfer. This instrument will lay the foundation for future advances in the field of traceability, and has the potential to accelerate and shape future research in this area.

2 INTELLECTUAL MERIT

The proposed work represents a complex instrumentation development project. The instrument will provide researchers with a repository of traceable artifacts and associated trace matrices and a set of benchmarked tasks and associated metrics. It will also provide a fully integrated plug and play research environment that will enable researchers to design experiments, establish traceability environments, and experiment through composing existing algorithms and techniques in new and innovative ways. Intellectually the work will contribute to advancing traceability research and also from an instrumentation perspective will deliver a novel experimental environment.

3 BROADER IMPACT

The benefits of the proposed instrument are expected to facilitate the application of traceability solutions across a broad range of software engineering activities including requirements analysis, architectural design, maintenance, reverse engineering, and IV&V (independent verification and validation) or V&V activities. The instrument will make state-of-the-art traceability results available to industry by enabling them to generate customized traceability environments and by providing support for conducting pilot studies. Results will also be disseminated broadly through outreach endeavors by the Center of Excellence for Software Traceability. Furthermore, the project will provide numerous opportunities for underrepresented minorities to participate.

Key Words: Traceability, instrumentation, benchmarks.