LETTER OF INTENT (LOI) TO THE NATIONAL SCIENCE FOUNDATION

LOI ID	LOI SUBMITED DATE	LOI DUE DATE	PROGRAM SOLICITATION ID
L02606223	**N/A**	**01/08/2019**	**NSF 19-512**

PROGRAM SOLICITATION TITLE

CISE Community Research Infrastructure

FOR CONSIDERATION BY NSF ORGANIZATION UNIT(S)

PRIMARY ORGANIZATION: **Division Of Computer and Network Systems**

PROJECT INFORMATION

PROJECT TITLE

CCRI:Medium: An Infrastructure for Reproducibility and Re-Use of Computational Research

SYNOPSIS

Infrastructure Description. We will build an open-source, component-based, extensible infrastructure that makes computational reproducibility easy for both authors and reviewers. The infrastructure will support the automatic capture and packaging of dependencies for a computational experiment in multiple operating systems and computational environments, from desktops to clusters and HPC environments. Multiple capture mechanisms will be developed that can handle requirements for a wide range experiments as well as constraints imposed by computational environments, from capturing dependencies at the operating system level, to inferring the use of language-specific packages (e.g., Python modules and R packages) and collecting the relevant packages with associated source code. These will not only contribute to the longevity of experiments, but also give researchers' the ability to reuse and easily extend an experiment. We will also develop a reproducibility server where researchers can seamlessly reproduce, modify, and extend a given packaged experiment through a Web interface. For experiments that include large data and require substantial compute resources, our infrastructure will allow users to bring their own computing to the platform, i.e., they will be able to connect to their own cloud infrastructure of choice. We envision this server will be used as a basic building block for systems that support reviewing (e.g., for conferences and journals) as well as to share scientific results (e.g., at different academic institutions or for different communities). CISE Research Focus. This project will produce new research in methods and tools to support computational reproducibility. Even though reproducibility is a requirement for science, the technical challenges involved in creating reproducible computational experiments have greatly limited its adoption in computer science. The proposed infrastructure aims to make reproducibility ubiquitous in computing and it has the potential to impact virtually all CISE research areas. In addition, the ability to reproduce experiments opens up new research opportunities, in particular, in debugging and assessing the quality of scientific results. Budget: $1,500,000

OTHER COMMENTS

We have not received any prior NSF funding for this infrastructure.

ORGANIZATION ATTRIBUTE

Academic Institutions (colleges, universities)

POINT OF CONTACT FOR NSF INQUIRIES

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CROSS DIRECTORATE LOI

PRIMARY DIRECTORATE: **Div Of Information & Intelligent Systems**
SECONDARY DIRECTORATE: **N/A**
TERTIARY DIRECTORATE: **N/A**

ADDITIONAL INFORMATION

Keywords and Project Type	**reproducibility, replicability, re-use, software preservation, review, debugging science**
Other PIs and Senior Personnel	**PIs: Juliana Freire (CSE & Data Science), Daniele Panozzo (CS), Dennis Shasha (CS); Senior Personnel: Remi Rampin (CSE), Vicky Steeves (Libraries and Data Science), Fernando Chirigati (Data Science and CSE)**
Collaborating Organizations	**n/a**

SENIOR PROJECT PERSONNEL

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PARTICIPATING ORGANIZATIONS

N/A