SAND2013-2146P

Sandia National Laboratories

Operated for the U.S. Department of Energy by
Sandia Corporation

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March 10, 2013

Dear NSF Program Manager:

After discussions with Drs Jeffrey Carver, Davide Falessi and Forrest Shull, I am excited to collaborate with them on their SI2-SSI proposal entitled "A Flexible Automated Environment to Improve the Quality of Computational Science and Engineering Software" (FLATMATE). I am highly interested in their work applying software engineering (SE) principles to the development of computational science and engineering (CSE) software. Their efforts are critical to improving the practices and processes in CSE software development, especially as CSE software becomes increasingly essential for scientific and engineering research and ever more complex in design and implementation.

I am the project lead of ForTrilinos (http://trilinos.sandia.gov/packages/fortrilinos/). ForTrilinos provides a set of object-oriented Fortran 2003 interfaces to packages in Trilinos, a massively scalable, open source, C++ software library. ForTrilinos offers Fortran applications direct access to capabilities in the Trilinos project. ForTrilinos emphasizes portability and scalable development. Portability is achieved via standards conformance, specifically by leveraging the recent Fortran 2003 standard compiler support of C interoperability constructs. Scalable development is achieved by automating the labor-intensive portions of the interface construction process and by Object-Oriented Design (OOD).

Some of the primary software development problems we face are related to observing portability requirements in this and other similar applications. Portability is extremely important when developing software intended for wide research use, open source, or production. Compiler extensions to programming language standards include in some cases very interesting and useful features, intrinsic procedures, and variations use cases. However, the use of such features prevents the portability of the software application. The ability to identify and report the use of non-standard compliant compiler features would allow developers to make the necessary changes required to address the problem early in the development process.

The ForTrilinos project is committed to collaborating with Drs. Carver, Falessi and Shull to be a testbed for their new infrastructure FLATMATE. We will interact with them early in the project to provide software quality rules that can be included in the tool. We will continue to interact with them over the course of the project as the infrastructure is deployed to provide feedback and evaluation. We expect that the quality and productivity of our software will increase as a result of this collaboration.

I strongly support Drs. Carver, Falessi and Shull in their efforts to obtain this grant. The FLATMATE proposal is unique in bridging the gap between the SE research community and the CSE software development community. Its funding will have a broad impact on many projects of interest to NSF.

Sincerely,

Karla Morris Ph.D.
Senior Member of Technical Staff