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Award Abstract #0509342

CSR-SMA: Collaborative Proposal: A Model-Driven Performance Analysis Framework for Distributed, Performance-Sensitive Software Systems

NSF Org: CNS

Initial Amendment Date: July 8, 2005

Latest Amendment Date: July 8, 2005

Award Number: 0509342

Award Instrument: Standard Grant

Program Manager: Frederica Darema
CNS Division of Computer and Network Systems
CSE Directorate for Computer & Information Science & Engineering

Start Date: September 1, 2005

Expires: August 31, 2007 (Estimated)

Awarded Amount to Date: \$200000

Investigator(s): Jeffrey Gray gray@cis.uab.edu(Principal Investigator)

Sponsor: University of Alabama at Birmingham
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NSF Program(s): EXP PROG TO STIM COMP RES,
COMPUTER SYSTEMS

Field Application(s): 0000912 Computer Science

Program Reference Code(s): HPCC,9218,9150,2884

Program Element Code(s): 9150,7354

ABSTRACT

This project focuses on innovative methods for design-time validation of DPSS software architectures and processes by conducting research on the following synergistic research activities: (1) Conceptual framework for performance analysis, which will apply Stochastic Reward Nets (SRNs)-based analytical/numerical techniques and simulation techniques for design-time performance analysis of DPSS system architectures. This activity will develop a theoretical framework to build configurable and composable performance analysis models of individual building blocks of middleware and their composition. (2) Model-driven generative technologies for whole-system performance analysis, which will eliminate error-prone and tedious ad hoc development of DPSS systems architectures and processes. (3) Aspect-oriented variability resolution, which will develop novel aspect-oriented modeling tools that help modularize the variability incurred by the configurable middleware building blocks. These tools will then weave in these artifacts into the existing performance models to specialize the blocks and their composition.

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