NSF Award in Computer and Information Science and Engineering

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- Project: CAREER: Lightweight, Blame-aware Contract Checking
- Start Date: June 1, 2009
- Total Award Amount: $429,723

How the results of this project will benefit society:

- Improve the state of the art in contract checking. Specifically, the PI will study the interaction between statically and dynamically verified portions of systems, in a manner similar to hybrid and gradual types.
- Integrate theorem provers into software systems in a way that their scope can be limited to just the most mission-critical parts of the system.

The problem the project is trying to solve:

As computers become more powerful, the limiting factor for building software systems is shifting away from the underlying computer’s performance limitations to the software’s inherent complexity.

What this project will accomplish:

- Using software contracts to separate a large system into smaller chunks, thereby enabling programmers to focus their energy on just one small part of the system at a time.
- Identifying failures and assigning blame in a software system failure using the contracts to identify a single sub-system as faulty, automatically narrowing the search for the underlying cause of the failure to that one subsystem or possibly its contract.
- Because software contracts are typically written in a language that is very close to the programming language, programmers only have to invest a little bit of their time and resources in order to start seeing the benefits of contracts.
- Creating the ability to add contracts to more sophisticated modularity mechanisms.
- Enabling contracts to generalize existing techniques for automatic test case and test oracle generation to support higher-order functions and unknown classes.

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