

***The University of Alabama
Department of Computer Science
Colloquium Series***

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Improving Programmer Productivity Tools with Intended Semantics

Monday, March 1st

Presentation at 11:00 a.m. in SEC 3437, refreshments across the hall in SEC 3438 at 10:45 a.m.

Abstract:

Because software continues to grow in size and complexity, programmers increasingly need help to understand, debug, and modify their programs. This help comes in the form of programmer productivity tools -- compilers, build systems, optimizers, bug finders, IDEs and many other kinds of tools assist programmers in all phases of the software life cycle.

One common challenge that these productivity tools face is modern languages have features (e.g. precise exceptions) that cause programmers to unintentionally over-specify their programs. This over-specification hinders the tools and degrades their results. For example, optimizers rarely produce the fastest code because they must preserve the over-specified semantics. If an optimizer knew which semantics the programmer intended, it could produce better code.

This talk gives an overview of the challenges developers face in large code bases and how productivity tools can help address these challenges. As an example for a productivity tool it describes IOpt, an interactive optimizer. IOpt interacts with the programmer in order to identify those parts of a programs' semantics that are due to unintentional over-specification. With knowledge of the programs' intended semantics, IOpt can apply aggressive optimizations and achieve significant performance gains.

Bio:

Daniel von Dincklage is a Software Engineer in the Engineering Productivity group at Google. Before Google, he completed his MS and PhD degrees in Computer Science at the University of Colorado at Boulder, and his Vordiplom from the Technical University in Darmstadt, Germany. His research interests include programmer productivity tools, intended semantics, scalable program analyses and SCM systems.