

Computer Science Department Research Colloquium

Empirical Software Engineering: Why and How do we Measure?

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Abstract

The field of Empirical Software Engineering views software engineering as a laboratory science. Our goal is to better understand the practice of software engineering through the observation and measurement of human behavior as it relates to software engineering. As such, we conduct human subject studies on various software engineering methods and techniques. In addition we mine and analyze data from existing software artifacts and repositories. This work lies at the intersection of Software Engineering and Psychology. In this talk, I will present an introduction to Empirical Software Engineering. I will discuss some of the basic concepts about conducting studies with human subjects including how to design valid studies, how to measure, and how to evaluate the quality of the results. After this introduction, I will explain my ongoing research in the context of this background.

My ongoing research covers the following topics: “Software Architecture” - How to handle changes late in the software lifecycle; “Software Inspections” - How to make them more effective through selection of the appropriate technique or selection of inspectors with the appropriate background; “Software Engineering for Computational Science” - What is the most effective set of software engineering practices for developing scientific software; “Computer Security” - Helping security analysts become more effective in identifying potential security violations; and Software Engineering Education.

Dr. Jeffrey Carver is an Assistant Professor in the Computer Science and Engineering Department at Mississippi State University. He received his PhD from the University of Maryland in 2003, under the supervision of Dr. Victor Basili. His PhD thesis was entitled “The Impact of Background and Experience on Software Inspections.” His current research interests include: Empirical Software Engineering, Software Inspections, Software Architecture, Qualitative Methods, Software Process Improvement, Software Engineering for Computational Science and Engineering and Computer Security. Dr. Carver’s work has appeared in venues such as Empirical Software Engineering – An International Journal, CrossTalk, The International Conference on Software Engineering (ICSE), The International Symposium on Empirical Software Engineering (ISESE), and The Conference on Software Engineering Education and Training (CSEE&T). His work has been funded by the National Science Foundation, The Army Corps of Engineers, the Army Research Labs, and the Air Force.

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