Reverse Engineering for Software Performance Engineering

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Abstract
Software reverse engineering can benefit from software performance engineering (SPE) techniques and vice versa. Reverse engineering’s system artifacts satisfy SPE’s need for a sequence of a software system in order to quantitatively analyze the system’s performance characteristics. The code profiling tools used in Software Performance Engineering can assist reverse engineering in understanding the behavior of the source code of a system. The aim of this workshop is to gather together researchers and practitioners working in the area of software performance engineering with an emphasis on code optimization and root cause analysis. We are interested in investigating how performance analysis can benefit from reverse engineering techniques. The objective of the workshop is to find common case studies and compare existing techniques. This workshop will be the first inclusion of this important industrial relevant topic within the software reverse engineering community. We aim to set up a forum for exchanging experiences, discussing solutions, and exploring new ideas.

Keywords
Software performance engineering, code profiling and reverse engineering

INTRODUCTION
As software complexity increases every year, a holistic view of performance has become a requirement. Customers need to combine and integrate many disparate systems across the enterprise. Customers, both internal and external, demand and deserve a world class experience with fast response times and mission critical uptime. For example, when an organization is on the verge of making a large investment into updating an existing software system, failure to deliver to their users is not an option. Subpar response times and availability cost a great deal, both in dollar figures and the organization’s reputation. This workshop will explore how software performance engineering techniques can be used to assist in reverse engineering existing systems and enable existing systems to meet the production needs of the business.

TOPICS
The main theme of the workshop is to investigate how existing software systems are reverse engineered for code optimization and for root cause analysis of poor software performance techniques. Topics of interest include:

• Software Performance Engineering:
  o Theories and models for software performance engineering based on software anti-patterns
  o Software performance engineering processes and strategies involving code optimization and code profiling techniques
  o Direct measurement techniques to build software models of existing systems
  o General SPE research methodologies
• Techniques and tools:
  o Applications of code profiling and optimization to software performance engineering projects
  o Strengths and limitations of existing techniques
  o Trace analysis and exploration techniques
  o Techniques for creating software models of existing systems and using models to perform what-if analysis for proposed changes to an existing system
  o Analysis tools with an emphasis on code profiling and optimization, and tools that trace the sequence of events in existing systems
• Evaluation Techniques:
  o Criteria for evaluating reverse engineering and performance analysis techniques
  o Experiments and case studies with a focus on code profiling, optimization and model generation of existing software systems in order to analyze the performance of proposed system enhancements

GOALS
We have a number of goals for each of the participants:

• Bring forward innovative techniques in the field
• Introduce comprehension strategies based on code profiling and optimization that have proven themselves in the field of software performance engineering and demonstrate how those techniques contribute to the field of reverse engineering
• Share results of case studies and experiments – find common case studies
• Compare various techniques
• Create an inventory of code profiling and optimization techniques
SUBMISSIONS
Participants will submit position statements as either a four page paper (in IEEE proceeding style) or an annotated set of slides. Participants should describe their experiences or ideas on software performance and reverse engineering techniques. The submissions should be in PDF format. The organizers will accept submissions based on originality, relevance, and suitability for triggering discussion.

IMPORTANT DATES
Dates are tentative and will change depending on WCRE’s early registration dates.
Deadline for submission of position statements: September 21, 2007
Notification of acceptance: October 2, 2007
Final papers due: October 15, 2007
Workshop date: Half day on October 29–31, 2007

WORKSHOP FORMAT
The workshop will be lively and interactive with short presentations and long discussion slots. All participants that submit a position statement will be given a chance to give a short presentation.

The presentations will serve to introduce position statements and stimulate debate. During the first 30 mins of the workshop day, all participants will be asked to introduce their top challenges in performance engineering and how they believe reverse engineering can help them address these challenges.

All accepted position statements will be published on the workshop webpage prior to the workshop.

PROGRAM COMMITTEE
The workshop program committee will constitute of experts from industry and academia in reverse and performance engineering. We expect the following researchers and practitioners to serve on the Program Committee of the workshop:

- Claire Cates, SAS Institute Inc.
- Parminder Flora, Research In Motion
- Johnny Gilliam, The Ian Thomas Group
- Ahmed E. Hassan, University of Victoria
- Kevin Mobley, The Ian Thomas Group
- Michael Stittleburg, Automatic Data Processing, Inc.
- Jeff Van Oflen, The Ian Thomas Group