Workshop on Program Comprehension through Dynamic Analysis (PCODA'10)

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Abstract—Applying program comprehension techniques may render software maintenance and evolution easier. Understanding a software system typically requires a combination of static and dynamic analysis techniques. The aim of this workshop is to bring together researchers and practitioners working in the area of program comprehension with an emphasis on dynamic analysis. We are interested in investigating how dynamic analysis techniques are used or can be used to enable better comprehension of a software system. The objective is to compare existing techniques, and to identify common case studies and possible symbioses for existing solutions. Building upon four previous editions of the workshop, we aim to set up a forum for exchanging experiences, discussing solutions, and exploring new ideas.

I. INTRODUCTION

Without consistent or adequately complete documentation, maintainers are faced with the inevitable problem of understanding how a software system is implemented prior to undertaking any maintenance task. Research into the discipline of program comprehension aims to reduce the impact of this problem.

Studies have shown that software engineers tend to spend up to 50% of their time trying to comprehend the structure of a software system [1]. This has led to the development of several program comprehension models and techniques such as those presented by Storey et al. [2].

The workshop on program comprehension through dynamic analysis (PCODA) focuses on program comprehension techniques that rely specifically on dynamic analysis [3]. As such, this workshop builds on previous experiences from existing workshops and conferences such as IWPC/ICPC (International Workshop/Conference on Program Comprehension), which tends to focus on static analysis techniques leaving out dynamic analysis, and WODA (Workshop on Dynamic Analysis), which focuses on forward engineering rather than to the challenges of reverse engineering.

The four previous editions of PCODA which were held in conjunction with the *Working Conference on Reverse Engineering* (WCRE) in respectively Pittsburgh (2005) [4], Benevento (2006) [5], Vancouver (2007) [6] and Antwerp (2008) [7], showed that there certainly is an active interest in the topic of program comprehension supported by dynamic analysis. In 2005 we received 13 high-quality paper submissions of which 11 were accepted, for 2006 we had 11 high-quality submissions of which 8 were accepted, in 2007 and 2008 we had 12 submissions of which we accepted 8. Each paper was reviewed by at least 2 members of the program committee. Additionally, the format of the workshop, where one presenter summarizes a number of papers from the participants, has proven successful in enabling a good mix of presentations and discussion.

In 2007 we also edited a special issue on the topic of program comprehension through dynamic analysis, which has since appeared in the July/August 2008 issue of Wiley's Journal of Software Maintenance and Evolution (JSME) [8]. For this special issue we received 12 submissions from which 4 high quality papers will be published in JSME.

II. TOPICS

The main theme for this workshop is program comprehension through dynamic analysis. Topics of interest include, but are not restricted to:

- **Program comprehension models:**
  - Theories and models for software comprehension based on dynamic analysis
  - Program comprehension processes and strategies involving dynamic analysis techniques
  - Research methodologies
- **Techniques and tools:**
  - Applications of dynamic analysis techniques to program comprehension
  - Strengths and limitations of existing techniques
  - Trace analysis and exploration techniques
  - Techniques for reducing the large size of run-time information
  - Hybrid analyses that involve both static and dynamic analysis
  - Dynamic analysis tools with an emphasis on program comprehension
  - Comparisons between existing tools and approaches
  - Dynamic analysis in the context of distributed systems and webservices (or service oriented architectures)
- **Evaluation Techniques:**
  - Criteria for evaluating techniques
  - Experiments and case studies with a focus on program comprehension using dynamic analysis
  - Empirical effectiveness studies

III. Target audience

The workshop is intended for software engineering professionals from industry and academia with an interest in program comprehension and reverse engineering through dynamic analysis; people who are actively engaged in reengineering projects, or who develop or research methodologies and tools.

IV. Goals

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

- Bring forward innovative techniques in the field
- Introduce comprehension strategies based on dynamic analysis that have proven themselves in the field
- Share results of case studies and experiments – find common case studies
- Compare various techniques
- Discuss how to perform empirical studies to validate the results
- Inventorize dynamic analysis techniques (with an emphasis on program comprehension) used in research.

V. Workshop format

a) Preparation: To make efficient use of the workshop time, we pay special attention to its preparation. We request from each participant to submit a (position) **paper** in advance. Participants are encouraged to read all accepted material, so that the workshop can be discussion-oriented rather than presentation-oriented.

b) Workshop structure: Each participant will briefly introduce himself/herself. Then a brief summary of all papers will be given. Papers will be grouped according to topic and one presenter, the "*topic leader*" who is designated in advance, will present all summaries of papers in one topic. The workshop will be **1/2 day, discussion-oriented**. Afterwards, each participant will be asked to formulate a short summary of the workshop (maximum 250 words), highlighting points of interest of his or her research. We will post the summaries on the PCODA website, so that potential collaborations will be made visible.

VI. Workshop proceedings

The workshop proceedings will be available to attendees of PCODA'10 and will also be available for download from the workshop website (http://swerl.tudelft.nl/bin/view/PCODA/PCODA2010).

References

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