Executive Summary of the Beyond Program Slicing Dagstuhl Seminar

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1. Overview

The aim of the "beyond program slicing" seminar was to explore emergent applications of program slicing and ways in which slicing techniques and ideas could be combined with those from other areas of program analysis and manipulation.

To achieve this goal, the seminar gathered together 36 people, including experts in the theory and practice of program slicing and those working on closely related areas, such as model checking, measurement, analysis, debugging, program comprehension, testing, re-engineering and semantics.

The seminar was structured to provide a mix of pre-prepared talks and talks on work developed by the participants during the seminar. To achieve this, time was set aside for group working in groups of three. Groups were chosen to facilitate cross pollination of ideas from different fields. There was also time provided for preparation and networking and for tutorials and demonstrations of practical systems. The discussions and collaborative work continued into the small hours every morning, yet all the participants remained energetic and enthusiastic throughout the event.

Several new topics and ideas emerged at the workshop, both through formal presentations by the formally constituted groups of three and through unplanned serendipitous collaboration between the participants. The organisers are confident that several of the abstracts the reader will find under the DROPS proceedings of the workshop will become extended papers, forming the seeds of on-going collaboration and work.

Section 2, briefly reviews some of the topics and ideas which emerged. This is necessarily a personal perspective of the organisers, and should be viewed as a proper subset of that which truly emerged. Section 3 lists some of the activities which participants agreed to undertake in order to strengthen and develop the infrastructure to support the community. Section 4 briefly mentions some of the "fun" activities on the social side. Section 5 provides a few statistics as a record of the composition of the participants and the programme. Section 6 concludes and section 7 contains a few acknowledgements.

2. Technical Outcomes

Many participants decided to undertake development and further work using the two featured tools: Stratego and Indus. These were demonstrated in tutorial mode on Tuesday and Thursday nights respectively. Both are free and relatively mature.

In a dedicated theory session there was a discussion and exposition of many of the current open problems in the foundations of program slicing. Some of these are remarkably

challenging, while others represent low lying research fruit, waiting to be picked by a keen computer scientist. The growing list of applications of slicing, make some of these theoretical questions, of semantics, minimality, equivalence extremely relevant and important.

Following the lively discussion of theoretical aspects of slicing, it was decided to hold an ASTReNet workshop on Formal Aspects of Source Code Analysis on the 6th and 7th of June 2006. The workshop will be help in co-operation with the British Computer Society special interest group on Formal Aspects of Computing, (BCS-FACS). More details are available on the ASTReNet website at http://www.astrenet.org/

The session on Conditioned Slicing, produced much interest in the possible applications of conditioning to testing and comprehension (among others). It was reported at the Indus Tutorial/Demo that there would be a symbolic execution facility available early in 2006. This being the case it was felt that the community was near to having all the pieces necessary for a conditioned slicing system for Java and there was great interest in developing such a technology from those working on conditioned slicing.

At the seminar, two participants (Sebastian and Karl) worked on a Real Instrumentation using Stratego. This was a simple system which gives tone to program execution, so that it becomes possible to listen to the tune played by program execution. This made for an excellent demonstration of the flexibility of the Stratego transformation system.

There was a prize for Group 5 (Silvia Breu, Nuno Feixa, and Marc Schlickling) for their presentation on Aspects, Clones and Bananas. This work showed how Haskell's Higher order semantics could be used to express aspects in a natural manner, without the need for a separate Aspect language. It mixed ideas of clone detection and aspect identification/migration from the imperative paradigm with the idea of bananas, a higher-order functional "iterator" formulation from the functional programming paradigm. It was widely believed that this interesting combination of ideas, techniques and paradigms might prove fruitful, both in formulation of aspects within imperative languages and identification and representation of aspects in functional languages.

During the seminar, several empirical studies of program comprehension and surveys of participants' views were conducted and analysed. The initial results of these were presented to the participants. This interactive activity was a distinctive and effective way of getting the participants engaged with the empirical questions being addressed and may provide a little interesting data for further analysis.

3. Community Building Outcomes

Jens Krinke said that he would take the website he has maintained and turn it over to the community as a slicing Wiki. It was agreed that this would be hosted at a separate domain which would be purchased for the community and maintained by all, through the mechanism of the Wiki. It is also planned to integrate this with a bibliography implemented using CiteULike.

Dave Binkley and Mark Harman agreed to make time to regularly update their 2003 survey paper on empirical results on slicing and to provide a refactoring of the paper every 3 or so years, so that the material it contained remains up-to-date and useful to the community. If possible, the survey will be gradually extended, to encompass slicing in general, rather than merely empirical results. This might, ultimately, lead to the "text book" on slicing which many have asked for and which was seen as important.

4. Fun

Brewery
On Wednesday evening the participants took a coach to visit a nearby brewery, where there was a tour, and a meal and drinks. The event was sponsored by the UK-based network, ASTReNet – Analysis, Slicing and Transformation Network. This is a network research project funded by the UK Engineering and Physical Science Research Council. ASTReNet also sponsored the attendance of some of the participants.

Hike
Following long established Dagstuhl tradition, there was a Hike on Wednesday afternoon. The weather was perfect; a clear, fresh November day with blue skies and a light breeze.

Skit
Following a separate tradition which emerged at the Source Code Analysis and Manipulation Workshop, there was an adaptation of the Monty Python Dead Parrot Sketch for the seminar which was performed to a packed house in the wine cellar. A video of this is available.

Pictures from the seminar are available on the ASTReNet website
http://www.astrenet.org/

5. Some Simple Participation Profiling Statistics

36 people attended the workshop, from 11 countries, which were: Great Britain (11), Germany (10), USA (3), Austria (2), France (2), Hungary (2), Netherlands (2), Belgium (1), Canada (1), Italy (1), Portugal (1).

6. Conclusion

The "beyond program slicing" Dagstuhl seminar was a resounding success with many technical outcomes which will continue to be developed by the inter-locking collaborative working groups formed during the seminar. The strong spirit of co-operation and collaboration which permeated the seminar is also expected to lead to a number of valuable, on-going, infrastructural, efforts to help in the support, facilitation and

maturation of this growing community of researcher within source code analysis and manipulation and its application to software engineering.

7. Thanks

The organizers, Dave Binkley, Mark Harman, and Jens Krinke, would like to express their sincere and heartfelt thanks to all the staff of Dagstuhl for their outstanding support and service throughout and beyond the seminar. They would also like to acknowledge and thank the effort, expertise and experience of the participants, who demonstrated an exemplary approach to productive and stimulating research work. Sincere thanks are also due to Neil Walkinshaw for collecting and preparing the Dagstuhl DROPS proceedings, to give a lasting record of the Beyond Program Slicing seminar