

SEBASE Steering Committee Meeting

10th October 2011

Cumberland Lodge, Windsor

Report on annual/final meeting

This is a report of the annual and final meeting of the EPSRC SEBASE project Steering Committee, held on 10th October 2011 at the Cumberland Lodge, Windsor.

1. Attendance:

Ms Nadia Alshahwan	CREST, UCL
Dr Rami Bahsoon	University of Birmingham
Mr Mustafa Bozkurt	CREST, UCL
Prof John Clark	University of York
Philippa Conmy	University of York
Prof Mark Harman	CREST, UCL
Ms Lena Hierl	CREST, UCL
Mr Yue Jia	CREST, UCL
Dr Nanlin Jin	University of Birmingham
Dr Kiran Lakhotia	CREST, UCL
Dr William Langdon	CREST, UCL
Mr Guanzhou Lu	University of Birmingham
Dr Leandro Minku	University of Birmingham
Mr Simon Poulding	University of York
Mr Jian Ren	CREST, UCL
Mr Jan Staunton	University of York
Dr Dirk Sudholt	University of Birmingham
Dr Shuo Wang	University of Birmingham
Prof Xin Yao	University of Birmingham
Dr Shin Yoo	CREST, UCL
Dr Yuanyuan Zhang	CREST, UCL

The Steering Committee Principals were represented by:-

Prof Mike Holcombe	University of Sheffield
Dr Christina Turner	EPSRC

Apologies were received from Prof Edward Tsang (University of Essex) and Prof Ian Sommerville (University of St Andrews).

2. Format of the day

The meeting started off with the approval of the minutes from the 2010 annual Steering Committee meeting that were sent to the Committee ahead of the meeting. The Steering Committee was then given a general presentation of the overall project achievements and developments since 2006 and especially the achievements within the last year of the project by Professor Harman (UCL). Professor Yao (Birmingham) continued with a more technical presentation on the projects achievements from a “Theoretical Foundation” perspective, followed by

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Professor Clark (York) who presented the project from a “Software Engineering” perspective.

After the presentations by the three PIs the Steering Committee had the opportunity to ask questions of the whole team and to give their final feedback. The meeting closed at 4:30pm.

The rest of this report records the main points covered in the PIs’ presentation as well as the oral feedback provided by the Steering Committee members Dr Turner (EPSRC) and Professor Holcombe (Sheffield).

3. PIs’ Presentations

3.1. Overall project overview by Professor Harman

Over its running time of five years the SEBASE project has become internationally leading. There has been industrial uptake and the project has also got international followers. Several international groups are following the project’s lead in the field and a graph of uptake, shown over a map of the world, indicates a wide geographic spread of activity including all continents.

Furthermore, the overall publications in this field have gone up which this is a trend that is continuing to grow. The UK is still recognised as the leader, an observation borne out by the percentage share of publications from UK institutions, which is the largest of any country at 25%. Since approximately half of these papers are authored or co-authored by the SEBASE partners, this indicates that SEBASE is the primary reason for the UK’s international leadership. However, we can also see, from bibliometric analysis that there have been recent rapid increases in publications from the world emergent economies such as Brazil and China can be detected as well. These bibliometric findings have been independently verified by a group from Brazil, which published a retrospective in September 2011.

There has also been significant industrial uptake of the project’s work, e.g. including on-going work with ABB, Berner&Mattner, Google, Honda, Microsoft, Motorola and IBM.

Further evidence for leadership comes from keynotes and best papers awards. SEBASE members have given 35 keynotes in total, which means there have been 9 just the previous year alone. SEBASE members have also received 4 Best Paper Awards in the last year, which will leave the project with a total of 14 over the duration of the project.

SEBASE has also had an impact on staff development of Research Associates and Research Students who have worked on the project. Several SEBASE

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Researchers have now become lecturing staff at different universities (Brunel, King's and Nottingham) and former PhD students have become RAs on SEBASE and other projects, some of whom have subsequently moved on into industrial roles.

3.2. Technical presentation by Professor Yao

Professor Yao then continued with a more technical overview of the project. SEBASE work has been based on experimental and theoretical studies and it was first introduced as a rigorous approach to analysing EAs for hard Software Engineering problems. Furthermore, all of the researchers are involved in foundational research, which encompasses and goes beyond complexity issues. Moreover, SEBASE is also gaining insight in the fitness landscape defined by Software Engineering problems. However, SEBASE is not just looking to solve classical Software Engineering problems. There are a lot of practical as well as theoretical issues that need to be solved.

3.3. “Lessons from SEBASE for Software Engineers” by Professor Clark

Professor Clark presented the project from a “Software Engineer’s point of view”. In 2006 people believed the SBSE community was a small and largely irrelevant monastic order, practising a rare and seldom-applicable set of techniques. However, after the SEBASE project, it is now widely recognised that almost any Software Engineer problem, appropriately formulated, is suitable for SBSE. By 2011 there have also been big changes in available computational power and equally big changes in the nature of software and application provision generally. All practical problems tend to involve solutions under constraints as there are always limited resources. This means that SBSE will always be a relevant approach.

3.4. Additional remarks by Professor Harman

Professor Harman concluded with the overall finding of the project: Software Engineering can be optimised and search can give us powerful techniques for optimisation and automation that apply right across the Software Engineering spectrum. This is changing how the world is thinking about Software Engineering.

However, it is not all about automation but the “human needs to be kept in the loop”. Hence automation that can be adapted as needed, i.e. Adaptive Automation. The next step therefore to develop new ways of building adaptivity into the automation offered by SBSE. The SEBASE PI’s are therefore working on a new project proposal together with Professor Burke from the University of Nottingham (moving to the University of Stirling). Professor Burke used to be on the SEBASE Steering Committee, but now has

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a conflict of interests due to having become a CI on the new proposal, which is called DAASE. Professor Burke also has a large EPSRC “pre-programme” grant, which is finishing in March 2012. The DAASE project will combine findings and achievements of both successful grants. Strong institutional support has been secured for the DAASE proposal: 26 PhDs, 7 lectureships, staff time and a Business Development Manager entirely funded by UCL have all been contributed by the four institutions that will be the partners for DAASE.

3.5. Comments and Questions by the Steering Committee

After the presentation by the three PIs the Steering Committee had the opportunity to comment and ask questions.

Dr Tuner asked about the effects of Professor Burke’s move (on 1st December) from the University of Nottingham to the University of Stirling, where he will become the deputy principle for research. Professor Harman explained that there will be research staff from the project moving with Professor Burke.

Furthermore, Dr Turner asked whether there were any other projects that were planned apart from the big DAASE proposal. All three PIs responded that there were several smaller projects planned, but the main focus for all of them over the past year had been the DAASE proposal, which will be submitted to EPSCR by 28th October 2011.

Furthermore, the Steering Committee enquired what the project team would do differently now. Professor Harman responded that a Business Development Manager, as planned in the DAASE proposal, would have been helpful for SEBASE, too, to maintain existing and establish new industry contacts. Also, the PIs would allocate more travel money to enable the project members to spend more time at the other sites. Moreover, SEBASE has made the PIs learn about the importance of social engagement and media awareness, which will be incorporated in the DAASE proposal (led by Drs. Sue Black and Peter Bentley). In DAASE, the release of apps is planned as well as a spin out company to maximise public understanding of the work and commercial exploitation of the results.

4. Feedback from the Steering Committee

4.1. Professor Mike Holcombe

Professor Holcombe said it was rewarding to see the impact the project had. He said it was good to see the how Search Based Software Engineering was now used in so many areas of Software Engineering, not just in Software Testing. He also thought the project clearly defined and refined the whole field and it convinced the community that this is an important direction to go in.

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This was especially demonstrated though the project's impact and the publications, which he indicated was a key achievement.

Professor Holcombe added that there were now plenty of opportunities to take this forward and also go into new technologies (e.g. apps). He concluded with the remark that the project had been managed extremely well during its running time.

4.2. Dr Christina Turner

Dr Turner agreed with Professor Holcombe's feedback and added that as much as everything else especially the academic impact of SEBASE was remarkable and that this form of impact is recognised and valued by the EPSRC. Furthermore, she thought that DAASE was a clear direction to take the project forward and carry on and have another step-change. She added that one of the clear demonstrations for this was the fact that the PIs and Professor Burke were able to get additional funding and strong institutional commitments for the DAASE proposal. Dr Turner concluded that it was important to remember that the DAASE project is considered in a competitive process and therefore there can be no absolute certainty that it will be successful. She added that it is important that the PIs of the group do not depend entirely on its success and consider what might be possible if it is unsuccessful. The EPSRC would not like to see the group and the partnerships built up through SEBASE fall apart.