

# CURRICULUM VITAE

## 1 PERSONAL INFORMATION

Dr. Sebastian DANICIC

(<http://sebastian.doc.gold.ac.uk>)

## 2 PRESENT APPOINTMENT

Present Post:	Reader in Computer Science
Department:	Computing
Date of appointment:	Sept 2007

## 3 PREVIOUS APPOINTMENTS

Year from	Year to	Appointment
March 2000	Sept 2007	Lecturer B Department of Computing Goldsmiths College University of London London SE14 6NW
1985	2000	Senior Lecturer School of Computing University of North London Holloway Rd London N7 8DB
1981	1985	Research Student Department of Computing Imperial College London 180 Queen's Gate London SW7 2AZ U.K.
1978	1981	Programmer/Analyst NCR Corporation Dayton Ohio USA

## 4 QUALIFICATIONS

Date	Title of Award	Subject	Class	Awarding Body
1977	BSc	Pure Mathematics	II. 1	Queen Mary College, London
1981	MSc	Computation	-	Oxford University
1999	PhD	Computer Science	-	University of N. London

## 5 HONOURS and DISTINCTIONS

Year	Honour or Distinction
2003	Centre For Excellence in Learning and Teaching Award

## 6 TEACHING AND EXAMINING

a. Contribution to taught courses (for the past three years).

List undergraduate and taught postgraduate (i.e. MA or equivalent) programme.

Date	Degree Programme/Course title	My rôle
2012–	Software Engineering Group Projects	Supervisor
2012–	Algorithms & Complexity Theory	Leader and initiator
2009–	Distributed Network Programming in Java	Leader and initiator
2009-2011	Web Programming (HTML5 & Javascript)	Leader and initiator
2009-2010	Data Structures in Java	Leader and initiator
2009-2010	Graphical User Interface Programming in Java	Leader and initiator
2008–2010	Object Oriented Programming in Java	Leader and initiator

b. Major teaching responsibilities in earlier years (with dates)

I have taught (and supervised projects) in a wide range of subjects to BSc, MSc and PhD students. I have also developed syllabuses and helped develop complete new degree programmes and accreditation and TQA documents.

Date	Degree Programme/Course title	My rôle
2001	Language Design and Implementation	Initiator
2000–	Computing - Introduction to Programming in Java	Leader and initiator
2000–	Computing Projects	Co-ordinator
2001	Language Design and Implementation (Compilers)	Initiator
1998	Computing - Maths for Computer Science	Leader and initiator
1996	Computing - Prolog Programming	Leader and initiator
1994	Computing - Functional Programming	Leader and initiator
1995	Computing - Communicating Sequential Processes (CSP)	Leader and initiator
1995	Computing - Compiler Techniques	Leader and initiator
1992	Computing – Concurrent Programming	Leader and initiator
1987	Computing – Formal Specification in Z	Leader and initiator
1985	Computing – Data Structures	Leader and initiator

I have produced distance learning material for various courses and pioneered new teaching methods.

## 7 POSTGRADUATE RESEARCH SUPERVISION (MPhil and PhD)

Degree	Dates	Currently Supervised	Supervised to Successful Completion	Total
PhD	2008-2013		James Hamilton (Goldsmiths)	
MPhil	2004-2009		Kostas Adamopoulos (Kings)	
PhD	2001-2006		Mohammed Daoudi (Goldsmiths)	
PhD	2001-2005		Lahcen Ouarbya (Goldsmiths)	
PhD	2001-2004		Michael Laurence (Goldsmiths)	
PhD	1997-2003		Yoga Sivagurunathan (UNL)	
PhD	1990-1994		George Karakitsos (UNL)	
PhD	1988-1992		Mark Harman (UNL)	
				8
PhD	2011-	Phil Tarr (Goldsmiths)		
PhD	2011-	Eamonn Martin (Goldsmiths)		
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## 8 External Examinerships

Date	My rôle	Institution
2013	PhD Examiner	University of Tampere, Finland
2011	PhD Examiner	Universidade do Minho, Braga, Portugal
2010	PhD Examiner	Kings College London
2008	PhD Examiner	Kings College London
2006	PhD Examiner	Imperial College London
2004	PhD Examiner	Imperial College London
1999	MPhil Examiner	Imperial College London

## 9 Staff Training

Staff training and development activities which you have co-ordinated, tutored, led or initiated in the last 3 years.

Date	Activity	Nature of Involvement
2004	An Automated Exam Paper production System	Trainer
2006	Trainer: Departmental Staff Java Training	Trainer

## 10 RESEARCH GRANTS

Date and Duration	Awarding Body	Project Title	My rôle	Value
2006 - Three years	EPSRC	Schemas:  Linear Schemas for Program Dependence  Ref: EP/E002919/1	<b>Principal Investigator</b>  Other named participants:  Mark Harman (Kings) (CI) Rob Hierons (Brunel) (CI)  Industrial Collaborators: Elaine Weyuker (AT &T) John Howroyd @UK PLC	£357,267.31
2006 - Three years	DTI	KTP Partnership with @UK PLC  To develop a product aware web spider as part of an integrated Internet search engine.  KTP Code: 1575	<b>Academic Supervisor</b>  Other named participants:  Mark Bishop (Goldsmiths) (Lead Academic)	£118, 309
2003 - Three years	EPSRC	TeTra  Evolutionary test data generation	<b>Co-investigator</b>  Other named participants:  Mark Harman (Brunel) (PI) Chris Fox (Essex) (CI) Rob Hierons (CI)	£269, 522
2000 - Six Months	EPSRC	GUSST  Guided Slicing and Transformation	<b>Co-investigator</b>  Other named participants:  Mark Harman (Goldsmiths) (PI) Jasna Kuljis (Goldsmiths) (CI) Chris Fox (Goldsmiths) (CI) Rob Hierons (Goldsmiths) (CI)	£135, 111

### 10.1 Patents and Software

I was the research supervisor on a KTP Partnership with Reading University and @UK PLC, an e-Commerce company integrating business, government and the Internet. The main output of this project was a spend-analysis system called *SpendInsight*, a system which enables organisations to efficiently re-order basic supplies based on analysis of what they already use. It employs new artificial intelligence algorithms developed during the KTP project, that automate the previously manual spend analysis process, enabling analysis to be performed with unprecedented speed and detail which have been used to highlight potentially huge savings in the organisations.

*SpendInsight* is already being deployed at a number of organisations, bringing essential revenue to @UK PLC. In particular, the service has already been sold to Basingstoke and North Hants NHS Foundation Trust and the NHS Share Business Service (with 128 NHS Trusts). However the most striking and significant impact of the research has resulted from its use by the National Audit

Office. It was noted in a recent National Audit Office report that the procurement of medical and other supplies consumables by NHS hospitals is essential to the quality of patient care and successful treatment outcomes. Using *SpendInsight* the National Audit Office have estimated that if hospital trusts were to amalgamate small, ad-hoc orders into larger, less frequent ones, rationalise and standardise product choices and strike committed volume deals across multiple trusts, they could make overall savings of at least £500 million, around 10 per cent of the total NHS consumables expenditure of £4.6 billion.

I am still actively collaborating with @UK PLC in further projects.

## 11 PUBLIC OUTPUT

### Papers

- [1] Sebastian Danicic and James Hamilton. Maximal-slice-based cohesion and coupling metrics. *Journal of Software: Evolution and Process*. (to Appear 2014).
- [2] Sebastian Danicic and Michael Laurence. Weak and strong static backward slicing of non-deterministic systems. *ACM Transactions on Programming Languages and Systems*. (submitted August 2013).
- [3] James Hamilton and Sebastian Danicic. Dependence Communities in Source Code. In *Proceedings of the IEEE 28th International Conference on Software Maintenance*. IEEE, October 2012.
- [4] Richard Barraclough, Mark Bishop, Sebastian Danicic, Richard Mitchell, and Slavomir Nasuto. Spendinsight: some remarks on deploying an intelligent spend-analysis system. In *Proceedings of the 1st Symposium on Nature Inspired Computing and Applications (NICA) AISB/IACAP World Congress*, July 2012. Birmingham, UK.
- [5] Sebastian Danicic, Robert Hierons, and Michael Laurence. On the computational complexity of dynamic slicing problems for program schemas. *Mathematical Structures in Computer Science*, 2011.
- [6] Sebastian Danicic, Robert Hierons, and Michael Laurence. Characterizing minimal semantics-preserving slices of predicate-linear, free, liberal program schemas. *Journal of Logic and Algebraic Programming*, May 2011.
- [7] Sebastian Danicic, Robert Hierons, and Michael Laurence. Complexity of data dependence problems for program schemas with concurrency. *ACM Transactions on Computation and Logic*, 2011.
- [8] Sebastian Danicic, Richard Barraclough, Mark Harman, John Howroyd, Akos Kiss, and Mike Laurence. A unifying theory of control dependence and its application to arbitrary program structures. *Theoretical Computer Science*, 412(49):6809–6842, November 2011.
- [9] An Evaluation of the Resilience of Static Java Bytecode Watermarks Against Distortive Attacks. *IAENG International Journal of Computer Science*, 38(1):1–15, 2011.
- [10] James Hamilton and Sebastian Danicic. A Survey of Static Software Watermarking. In *Proceedings of the World Congress on Internet Security 2011*, pages 114–121, London, 2011. IEEE.
- [11] Richard Barraclough, David Binkley, Sebastian Danicic, Mark Harman, Robert Hierons, Ákos Kiss, and Michael Laurence. A trajectory-based strict semantics for program slicing. *Theoretical Computer Science*, 411:1372–1386, March 2010.
- [12] James Hamilton and Sebastian Danicic. An Evaluation of Static Java Bytecode Watermarking. In *Proceedings of the International Conference on Computer Science and Applications (ICCSA10), The World Congress on Engineering and Computer Science (WCECS10)*, volume 1, pages 1 – 8, San Francisco, USA, October 2010.
- [13] James Hamilton and Sebastian Danicic. An evaluation of current java bytecode decompilers. In *2009 Ninth IEEE International Working Conference on Source Code Analysis and Manipulation*, volume 0, pages 129–136, Edmonton, Alberta, Canada, 2009. IEEE.
- [14] Sebastian Danicic, Mark Harman, Robert Mark Hierons, John Howroyd, and Mike Laurence. Equivalence of linear, free, liberal, structured program schemas is decidable in polynomial time. *Theoretical Computer Science*, 373:1–18, March 2007.

- [15] Sebastian Danicic, , Mark Harman, John Howroyd, and Lahcen Ouarbya. A non-standard semantics for program slicing and dependence analysis. *Logic and Algebraic Programming, Special Issue on Theory and Foundations of Programming Language Interference and Dependence*, 72:123–240, July-August 2007.
- [16] David Clark, Sebastian Danicic, and Roberto Giacobazzi. Special issue on theory and foundations of programming language interference and dependence. *Logic and Algebraic Programming*, 72:123–240, July-August 2007.
- [17] Sebastian Danicic, David Binkley, Tibor Gyimóthy, Mark Harman, Ákos Kiss, and Bogdan Korel. A formalisation of the relationship between forms of program slicing. *Science of Computer Programming*, 62(3):228–252, 2006.
- [18] David Binkley, Sebastian Danicic, Tibor Gyimóthy, Mark Harman, Ákos Kiss, and Bogdan Korel. Theoretical foundations of dynamic program slicing. *Theoretical Computer Science*, 360(1):23–41, 2006.
- [19] David Wendell Binkley, Sebastian Danicic, Mark Harman, John Howroyd, and Lahcen Ouarbya. A formal relationship between program slicing and partial evaluation. *Formal Aspects of Computing*, 18(2):103–119, 2006.
- [20] Sebastian Danicic, Chris Fox, Mark Harman, Robert Mark Hierons, John Howroyd, and Mike Laurence. Slicing algorithms are minimal for programs which can be expressed as linear, free, liberal schemas. *The computer Journal*, 48(6):737–748, 2005.
- [21] Sebastian Danicic, Mohammed Daoudi, Chris Fox, Mark Harman, Robert Mark Hierons, John Howroyd, Lahcen Ouarbya, and Martin Ward. Consus: A lightweight program conditioner. *Journal of Systems and Software*, 77(3):241–262, 2005.
- [22] Mark Harman, Lin Hu, Malcolm Munro, Xingyuan Zhang, David Wendell Binkley, Sebastian Danicic, Mohammed Daoudi, and Lahcen Ouarbya. Syntax-directed amorphous slicing. *Journal of Automated Software Engineering*, 11(1):27–61, January 2004.
- [23] Chris Fox, Sebastian Danicic, Mark Harman, and Robert Mark Hierons. ConSIT: a fully automated conditioned program slicer. *Software—Practice and Experience*, 34:15–46, 2004. Published online 26th November 2003.
- [24] Keith Brian Gallagher, Mark Harman, and Sebastian Danicic. Guaranteed inconsistency avoidance during software evolution. *Journal of Software Maintenance and Evolution*, 15(6):393–416, Nov/Dec 2003.
- [25] Mark Harman, David Wendell Binkley, and Sebastian Danicic. Amorphous program slicing. *Journal of Systems and Software*, 68(1):45–64, October 2003.
- [26] Michael R. Laurence, Sebastian Danicic, Mark Harman, Rob Hierons, and John Howroyd. Equivalence of conservative, free, linear program schemas is decidable. *Theoretical Computer Science*, 290:831–862, January 2003.
- [27] Robert Mark Hierons, Mark Harman, and Sebastian Danicic. Using program slicing to assist in the detection of equivalent mutants. 9(4):233–262, 1999.
- [28] Mark Harman and Sebastian Danicic. A new algorithm for slicing unstructured programs. *Journal of Software Maintenance and Evolution*, 10(6):415–441, 1998.
- [29] Sebastian Danicic, David Binkley, Tibor Gyimóthy, Mark Harman, Ákos Kiss, and Bogdan Korel. Minimal slicing and the relationships between forms of slicing. In *5<sup>th</sup> IEEE International Workshop on Source Code Analysis and Manipulation (SCAM 05)*, pages 45–54, Los Alamitos, California, USA, 2005. Best paper award winner.
- [30] Sebastian Danicic, Mark Harman, John Howroyd, and Lahcen Ouarbya. A lazy semantics for program slicing. In *1<sup>st</sup>. International Workshop on Programming Language Interference and Dependence*, Verona, Italy, August 2004.
- [31] Sebastian Danicic, Mark Harman, Robert Hierons, John Howroyd, and Mike Laurence. Applications of linear program schema-tology in dependence analysis. In *1<sup>st</sup>. International Workshop on Programming Language Interference and Dependence*, Verona, Italy, August 2004.
- [32] Dave Binkley, Sebastian Danicic, Tibor Gyimóthy, Mark Harman, Ákos Kiss, and Lahcen Ouarbya. Formalizing executable dynamic and forward slicing. In *4<sup>th</sup> International Workshop on Source Code Analysis and Manipulation (SCAM 04)*, pages 43–52, Los Alamitos, California, USA, September 2004.
- [33] Sebastian Danicic, Andrea De Lucia, and Mark Harman. Building executable union slices using conditioned slicing. In *12<sup>th</sup> International Workshop on Program Comprehension*, pages 89–97, Los Alamitos, California, USA, June 2004.

- [34] Mohammed Daoudi, Sebastian Danicic, John Howroyd, Mark Harman, Chris Fox, Lahcen Ouarbya, and Martin Ward. ConSUS: A scalable approach to conditioned slicing. In *IEEE Working Conference on Reverse Engineering (WCRE 2002)*, pages 109–118, Los Alamitos, California, USA, October 2002. Invited for special issue of the Journal of Systems and Software as best paper from WCRE 2002.
- [35] Lahcen Ouarbya, Sebastian Danicic, Dave (Mohammed) Daoudi, Mark Harman, and Chris Fox. A denotational interprocedural program slicer. In *IEEE Working Conference on Reverse Engineering (WCRE 2002)*, pages 181 – 189, Los Alamitos, California, USA, October 2002.
- [36] Mark Harman, Lin Hu, Robert Mark Hierons, Chris Fox, Sebastian Danicic, André Baresel, Harmen Sthamer, and Joachim Wegener. Evolutionary testing supported by slicing and transformation. In *IEEE International Conference on Software Maintenance*, page 285, Los Alamitos, California, USA, October 2002.
- [37] Mark Harman, Chris Fox, Robert Mark Hierons, Lin Hu, Sebastian Danicic, and Joachim Wegener. Vada: A transformation-based system for variable dependence analysis. In *IEEE International Workshop on Source Code Analysis and Manipulation (SCAM 2002)*, pages 55–64, Los Alamitos, California, USA, October 2002.
- [38] Mark Harman, Lin Hu, Xingyuan Zhang, Malcolm Munro, Sebastian Danicic, Mohammed Daoudi, and Lahcen Ouarbya. An interprocedural amorphous slicer for WSL. In *IEEE International Workshop on Source Code Analysis and Manipulation (SCAM 2002)*, pages 105–114, Los Alamitos, California, USA, October 2002. Selected for consideration for the special issue of the Journal of Automated Software Engineering.
- [39] Mark Harman, Rob Mark Hierons, Sebastian Danicic, John Howroyd, and Chris Fox. Pre/post conditioned slicing. In *IEEE International Conference on Software Maintenance (ICSM'01)*, pages 138–147, Los Alamitos, California, USA, November 2001.
- [40] Mark Harman, Rob Mark Hierons, Sebastian Danicic, John Howroyd, Mike Laurence, and Chris Fox. Node coarsening calculi for program slicing. In *8<sup>th</sup> Working Conference on Reverse Engineering*, pages 25–34, Los Alamitos, California, USA, October 2001.
- [41] Chris Fox, Mark Harman, Rob Mark Hierons, and Sebastian Danicic. Backward conditioning: a new program specialisation technique and its application to program comprehension. In *9<sup>th</sup> IEEE International Workshop on Program Comprehension*, pages 89–97, Los Alamitos, California, USA, May 2001.
- [42] Sebastian Danicic, Chris Fox, Mark Harman, and Rob Mark Hierons. ConSIT: A conditioned program slicer. In *IEEE International Conference on Software Maintenance (ICSM'00)*, pages 216–226, Los Alamitos, California, USA, October 2000.
- [43] Mark Harman, Rob Mark Hierons, and Sebastian Danicic. The relationship between program dependence and mutation analysis. In W. Eric Wong, editor, *Mutation Testing for the New Century (proceedings of Mutation 2000)*, pages 5–13, San Jose, California, USA, October 2001. Kluwer.
- [44] Sebastian Danicic and Mark Harman. Espresso: A slicer generator. In *ACM Symposium on Applied Computing, (SAC'00)*, pages 831–839, Como, Italy, March 2000.
- [45] Mark Harman, Chris Fox, Rob Mark Hierons, David Wendell Binkley, and Sebastian Danicic. Program simplification as a means of approximating undecidable propositions. In *7<sup>th</sup> IEEE International Workshop on Program Comprehension (IWPC'99)*, pages 208–217, Los Alamitos, California, USA, May 1999.
- [46] Mark Harman, Yoga Sivagurunathan, and Sebastian Danicic. Analysis of dynamic memory access using amorphous slicing. In *IEEE International Conference on Software Maintenance (ICSM'98)*, pages 336–345, Los Alamitos, California, USA, November 1998.
- [47] Mark Harman, Margaret Okunlawon, Bala Sivagurunathan, and Sebastian Danicic. Slice-based measurement of coupling. In Rachel Harrison, editor, *19<sup>th</sup> ICSE, Workshop on Process Modelling and Empirical Studies of Software Evolution*, Boston, Massachusetts, USA, May 1997.
- [48] Yoga Sivagurunathan, Mark Harman, and Sebastian Danicic. Slicing, I/O and the implicit state. In Mariam Kamkar, editor, *3<sup>rd</sup> International Workshop on Automated Debugging (AADEBUG'97)*, volume 2 of *Linköping Electronic Articles in Computer and Information Science*, pages 59–65, Linköping, Sweden, May 1997.

- [49] Sebastian Danicic and Mark Harman. A simultaneous slicing theory and derived program slicer (keynote). In *4<sup>th</sup> RIMS Workshop in Computing*, Kyoto University, Kyoto, Japan, July 1996.
- [50] Sebastian Danicic, Mark Harman, and Yogasundry Sivagurunathan. A parallel algorithm for static program slicing. *Information Processing Letters*, 56(6):307–313, December 1995.

### Subject Guides

- [1] S.Danicic. Introduction to Java and object-oriented programming(Volume 1). *University of London External Program, University of London Press*, 2002.
- [2] S.Danicic. Introduction to Java and object-oriented programming(Volume 2). *University of London External Program, University of London Press*, 2002.

## 12 CONTRIBUTIONS TO DEPARTMENT/ACADEMIC GROUP IN THE UNIVERSITY

- a. Membership of College committees and working parties (including representing College on outside bodies)

Dates	Committee/Working party	Position Held
2003–	Departmental Teaching and Learning Committee	Committee Member
2005–2011	Departmental Resources Committee	Committee Member
2005–2011	Departmental Lab Users Group	Chair
2006–2011	Departmental Research Committee	Committee Member

### 12.1 Departmental administrative responsibilities

(e.g. admissions tutor, postgraduate tutor etc.)

Date	Position Responsibility
2003–	Director of the Program Transformation and Analysis Group
2010–	Program Leader BSc. Computer Science
2011–2012	Postgraduate Tutor
2009–2011	Technical Report Officer
2009–2011	Grant Workshop Organiser
2002–2004	Line Manager for the Departmental Systems Administrator
2005–2006	First Year Teaching Team Leader
2000–2007	CIS BSc Final Year Project Co-ordinator
2002–2004	Deputy Director of Post Graduate Studies
2001–2003	Departmental Web Page Organiser
2002–2007	Departmental Labs and Equipment Officer
2003–2007	Departmental Teaching and Learning Officer
2004–2007	Chair Lab User Group
2004–2006	Open Day Organiser
2002–2011	Mentor

### 12.2 Inter- or intra-departmental co-operation

Date	Nature of Co-Operation
2003–2007	Computer Services Liaison Officer



## 13 CONTRIBUTIONS TO UNIVERSITY OF LONDON

Date	Office Held
2000-present	Examiner - University of London External Program
2000-present	Author - University of London External Program
2000-present	Reviewer - University of London External Program

Date	Committee/Working Party
2000-present	Exam Board - University of London External Program

## 14 STAFF TRAINING AND DEVELOPMENT

- a. Staff training and development activities in which you have participated or have undertaken e.g., seminars, short courses, workshops, personal or self-development projects

Date	Activity
2003	Third LTSN one day conference on the teaching of Programming
2002	ILT workshop
2000-	Many VASTT meetings.

### Major conferences<sup>1</sup> attended as a participant

Date	Conference
2011	10th CREST Open Workshop (Keynote), Program Analysis and Slicing, University College London.
2009	Ninth IEEE International Working Conference on Source Code Analysis and Manipulation, Edmonton, Canada
2008	International Workshop on Programming Language Interference and Dependence, Valencia, Spain,
2007	Seventh IEEE International Working Conference on Source Code Analysis and Manipulation, Paris, France
2007	International Workshop on Programming Language Interference and Dependence, Lyngby, Denmark,
2006	The Seventh ASTReNet Workshop Formal Aspects of Source Code Analysis and Manipulation
2006	The Sixth ASTReNet Workshop on Source Code Analysis and Manipulation for Security
2006	The Fifth ASTReNet Workshop Empirical Studies of Source Code Analysis and Manipulation
2005	Dagstuhl (06.11.05 - 11.11.05, Seminar 05451), Germany –Beyond Program Slicing –Conditioned Slicing
2005	Fifth IEEE International Workshop on Source Code Analysis Manipulation, Budapest, Hungary
2005	Second International Workshop on Programming Language Interference and Dependence, Imperial College, London
2004	First International Workshop on Programming Language Interference and Dependence, Verona, Italy

## 15 PROFESSIONAL ACTIVITIES OUTSIDE THE UNIVERSITY

- I have regular meetings with our industrial partner, @UK PLC in Aldermaston, Berkshire as Academic Supervisor on the KTP Web Spidering Project.
- I am on the program committee the IEEE International Workshop on Source Code Analysis.
- I am guest editor for a special issue of the Journal of Logic and Algebraic Programming (Published by Elsevier) on Theory and Foundations of Programming Language Interference and Dependence.
- I have refereed for top quality journals and conferences. Including, for example, *The Computer Journal* (Published by Oxford University Press on behalf of the British Computer Society).
- I have refereed several funding bids for the EPSRC.

<sup>1</sup>The International Workshop on Programming Languages Interference and Dependence (PLID) runs as part of The International Static Analysis Symposium (SAS) and the International Workshop on Source Code Analysis and Manipulation runs as part of the International Conference on Software Maintenance (ICSM).

- I am a regular attendee and contributor to the ASTReNet. This is an EPSRC funded network project that aims to bring together researchers working on Analysis, Slicing and Transformation to see how these techniques can be combined and enhanced.
- I am a founder member of the *VASTT* research group which has many collaborators at other universities in London, UK, Europe and America. The *VASTT* group's is becoming internationally recognised. Its work is concerned with extraction, modification and verification of systems and their components, primarily using techniques associated with program slicing and transformation.

SIGNED:

DATE:

## 16 Referees

1. Professor Mark Harman  
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