

## DOCTORAL RESEARCH

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Thesis Title: **Formalisations and Applications of Business Process Modelling Notation**

University: University of Oxford

Supervisor: Prof. Jeremy Gibbons

Examiners: Prof. Michael Butler (external), Dr. Andrew Simpson (internal)

Funding: Microsoft Research

Summary:

- Formalised the syntax and the semantics of Business Process Modelling Notation (BPMN)
- Provided an abstract syntax in the language of Z
- Provided two semantic models in Communicating Sequential Processes (CSP)
- Formalised the semantic construction of BPMN in CSP
- Formalised the monotonicity property and the behavioural compatibility within the provided semantics
- Explored property specifications in Linear Temporal Logic under the CSP refinement setting for BPMN
- Implemented semantic functions from ILOG BPMN definition to CSPm in Haskell
- Implemented a property specification tool in Haskell
- Conducted case studies on complex BPMN definitions with over 100 control elements
- Applied the formal framework to reason about clinical trial protocols

## RESEARCH PROJECTS

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Oct 2013 – Sep 2016

**EU FP7-610582: Engineering Virtualized Services**

(<http://www.envisage-project.eu/>)

Oct 2012 – Oct 2016

**COST Action IC1201: Behavioural Types for Reliable Large-Scale Software Systems**

(<http://www.behavioural-types.eu/>)

Oct 2009 – Oct 2013

**EU FP7-231620: Highly Adaptable and Trustworthy Software using Formal Models**

(<http://www.hats-project.eu/>)

Oct 2005 – Oct 2008

**CancerGrid: Open Standards for Clinical Cancer Informatics**

(<http://www.cs.ox.ac.uk/projects/cancergrid/>)

## INVITED TALKS

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Oct 2013

- **Formal Methods for Cloud Applications.** *Institute for Programming research and Algorithmics Advanced Course*, Eindhoven University of Technology, Eindhoven, NL
- **Formal Methods @ SDL Fredhopper.** *Guest Lecture*, Universiteit Twente, Enschede, NL

Jan 2012

- **Delta Modeling Workflow.** *Amsterdam Coordination Group*, CWI, Amsterdam, NL.

Oct 2011

- **Modelling Distributed Adaptable Object Oriented Systems using HATS Approach: A Fredhopper Case Study.** *2nd International Conference on Formal Verification of Object-Oriented Software*, Torino, Italy

Oct 2008

- **Property Specifications for Workflow Modelling.** *GRACE Seminar*, National Institute of Informatics, Tokyo, Japan

## **PROGRAMME AND ORGANISING COMMITTEES**

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2016

- PC-member of **31st Annual ACM Symposium on Applied Computing Track on Service Oriented Architectures and Programming**

2014

- PC-member of **5th International Conference on Cloud Computing, GRIDs, and Virtualization**
- PC-member of **11th International Conference on Integrated Formal Methods**

2013

- PC-member of **28th Annual ACM Symposium on Applied Computing Track on Service Oriented Architectures and Programming**
- PC-member of **2nd International Workshop on Behavioural Types**
- PC-member of **11th IEEE/IFIP International Conference on Embedded and Ubiquitous Computing**

2012

- PC-member of **27th Annual ACM Symposium on Applied Computing Track on Service Oriented Architectures and Programming**
- PC-member of **4th International Workshop on Business Process Modelling Notation**
- PC-member of **10th IEEE/IFIP International Conference on Embedded and Ubiquitous Computing**
- OC-member of **3rd International Workshop on Formal Methods and Analysis in Software Product Line Engineering**

2011

- PC-member of **26th Annual ACM Symposium on Applied Computing Track on Service Oriented Architectures and Programming**
- PC-member of **3rd International Workshop on Business Process Modelling Notation**
- OC-member of **2nd International Workshop on Formal Methods and Analysis in Software Product Line Engineering**

2010

- PC-member of **2nd International Workshop on Business Process Modelling Notation**

2009

- PC-member of **1st International Workshop on Business Process Modelling Notation**
- PC-member of **7th IEEE/IFIP International Conference on Embedded and Ubiquitous Computing**

## **JOURNAL REVIEWERS**

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- Software and Systems Modeling
- ACM Transactions on Software Engineering and Methodology
- Science of Computer Programming
- Fundamenta Informaticae
- RAIRO – Theoretical Informatics and Applications
- Information and Software Technology
- Simulation Modelling Practice and Theory
- Formal Aspect of Computing

## **EXTERNAL REVIEWERS**

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- 20th International Conference on Fundamental Approaches to Software Engineering
- 21st International Symposium on Formal Methods
- 12th International Conference on integrated Formal Methods
- 10th International Conference on Integrated Formal Methods
- 2nd International Symposium on Foundations of Health Information Engineering and Systems
- 8th International Symposium on Formal Methods for Components and Objects
- ACM SIGPLAN 2009 Haskell Symposium
- 12th ACM SIGPLAN International Conference on Functional Programming
- IEEE Transactions on Software Engineering