



Prakash Chandrasekaran

*“Applying Formal Methods in Model Based Design,
and Concurrency issues in Asynchronous Components.”*

Current

Mar 2010 — Nov 2011 **Post-Doctoral Researcher**
Laboratoire d'Intégration des Systèmes et des Technologies (LIST), CEA, France.
Worked on applying Formal Methods in a UML based design framework, for design and testing of distributed timed components under the ITEA-VERDE Project.

Ph.D. Dissertation

Title *Design & Programming of Asynchronous Concurrent Systems
- A Natural Verifiable Approach*
Advisor *Madhavan Mukund*

Education

2009 **Ph.D.**, *Computer Science*, Chennai Mathematical Institute.
2003 **M.Sc.**, *Computer Science*, Chennai Mathematical Institute.
2001 **B.Sc. (Hons)**, *Mathematics & Computer Science*, Chennai Mathematical Institute.

Publications

SEFM '09 *Specifying Interacting Components with Coordinated Concurrent Scenarios with Madhavan Mukund*
EC2 Workshop, CAV '09 *Design and Specification of Concurrent System Components*
FSE '07 *Programming Asynchronous Layers with CLARITY with Christopher L. Conway, Joseph Joy, Sriram Rajamani*
GM R&D Workshop '07 *Adding Time to Scenarios with Madhavan Mukund*
GM R&D Workshop '07 *Verifiable Design of Asynchronous Software with Christopher L. Conway, Joseph Joy, Sriram Rajamani*
FORMATS '06 *Matching Scenarios with Timing Constraints with Madhavan Mukund*

Patents

US 7917900 **Enabling Analysis of Software Source Code**
Sriram Rajamani, Prakash Chandrasekaran, Christopher L. Conway, Joseph Joy
Granted: 29 March 2011. Assignee: Microsoft Corporation

Research Interests

- Keywords** Model based Design & Synthesis, Model Based Integration (Testing, and Verification), Formal Methods, Asynchronous Programming, Timed Systems
- Description** My research interests are in design of formal models for communicating systems involving asynchronous components, with a focus on verifiability, and the verification of such models. Also, of interest is the concurrency issues that arise in such systems. I'm also interested in specification languages and programming models for concurrent systems, and the synthesis of interface adapters (eg. device drivers) from interface specification of other communicating components. Areas like Model Based Integration also interest me, as it would help in my larger objective of developing an end to end model based framework.

Research Objective

- Objective** My objective for next few years is to, develop a framework, incorporating the state of the art formal methods techniques, for specification, design and validation of communicating system components. Based on the nature of the domain, the framework would support the relevant code synthesis as well. For domains like embedded systems the synthesis could be automated and complete. Whereas, for software systems, it could be just the skeleton code and might require user guidance. It would be desirable that the framework be modular, and easily adaptable and reusable in other related domains.

Teaching Experience

- Aug-Dec 2004 & Aug-Dec 2006 Operating Systems - Graduate course
(Course included Linux internals, and writing simple kernel modules)

References

- **Madhavan Mukund**, Chennai Mathematical Institute, Chennai, India.
madhavan@cmi.ac.in
- **Chokri Mraidha**, LIST, CEA (Saclay), France.
chokri.mraidha@cea.fr
- **Christophe Gaston**, LIST, CEA (Saclay), France.
christophe.gaston@cea.fr

Personal Details

- Date of Birth** 28 April 1981
- Marital Status** Married
- Nationality** Indian
- E-Mail** prakash@cmi.ac.in (*preferred*),
prakash.pc@gmail.com
- Phone** +91 9444025619 (*IN*)
- Permanent Address** F1 Vignesh Flats,
Plot 11, Raj Paris Nagar,
State Bank Colony,
Chitlapakkam,
Chennai. IN 600064.

