

Kumar Madhukar

Scientist, TCS Research

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Education

Chennai Mathematical Institute

Chennai, India

DOCTOR OF PHILOSOPHY (Ph.D.) IN COMPUTER SCIENCE

Aug 2012 – Nov 2018

- Thesis: Scalable Safety Verification of Statechart-like Programs
- Advisors: Prof. Mandayam Srivas (Chennai Mathematical Institute), and Dr. Peter Schrammel (University of Sussex, UK, & Diffblue, Oxford)

MASTER OF SCIENCE (M.Sc.) IN COMPUTER SCIENCE, CGPA: 8.56/10.0

Aug 2006 – Jul 2008

BACHELOR OF SCIENCE (B.Sc.) IN MATHEMATICS AND COMPUTER SCIENCE, CGPA: 6.92/10.0

Aug 2003 – Jul 2006

Work Experience

TCS Research

Pune, India

SCIENTIST

Jul 2010 - present

- In the Software Verification and Validation group at Tata Research Development and Design Center in Pune.

SUMMER INTERN

May 2009 - Jun 2009

- As a researcher in the same group.
- Worked on modeling of Statecharts using Promela, for model checking with SPIN.

Valuepitch Interactive IT Services

Mumbai, India

M.Sc. THESIS/PROJECT

Jan 2008 - Jun 2008

- Implemented an online reputation management tool based on Sentiment Mining.
- Thesis: Natural Languages and Not-So-Natural Processing
- Advisor: Prof. Pushpak Bhattacharya (IIT Bombay)

SUMMER INTERN

May 2007 - Jul 2007

- Built a web crawler to obtain customer/user reviews (in English) of a product or service.
- Implemented a summarizer for the reviews that preserves the underlying sentiment.

Pinstorm Technologies

Mumbai, India

SUMMER INTERN

May 2006 - Jul 2006

- Implemented an automated bidding system for Google Adwords.
- Worked under the supervision of Dr. V Vinay (Ex-Chairman, PicoPeta Simputers).

Selected Publications

Using Hypersafety Verification for Proving Correctness of Programming Assignments

ICSE (NIER) 2020

Jude Anil, Sumanth Prabhu, Kumar Madhukar, R. Venkatesh

Quantified Invariants via Syntax-Guided-Synthesis

CAV 2019

Grigory Fedyukovich, Sumanth Prabhu, Kumar Madhukar, Aarti Gupta

Solving Constrained Horn Clauses Using Syntax and Data

FMCAD 2018

Grigory Fedyukovich, Sumanth Prabhu, Kumar Madhukar, Aarti Gupta

Efficiently Learning Safety Proofs from Appearance as well as Behaviours

SAS 2018

Sumanth Prabhu, Kumar Madhukar, R. Venkatesh

Generalizing specific-instance interpolation proofs with SyGuS

ICSE (NIER) 2018

Muqsit Azeem, Kumar Madhukar, R. Venkatesh

Compositional Safety Refutation Techniques

Kumar Madhukar, Peter Schrammel, Mandayam Srivas

ATVA 2017

Accelerating Invariant Generation

Kumar Madhukar, Björn Wachter, Daniel Kroening, Matt Lewis, Mandayam Srivas

FMCAD 2015

Verifying synchronous reactive systems using lazy abstraction

Kumar Madhukar, Mandayam Srivas, Björn Wachter, Daniel Kroening, Ravindra Metta

DATE 2015

Teaching Experience

Constraint (SMT) Solving and Deep Learning

Aug - Nov 2020, With Prof. Mandayam Srivas as co-instructor, Online

CMI, Chennai

Model Checking and Software Verification

July - Nov 2019

IIT Goa

Academic Visits

Department of Computer Science, Princeton University

Host: Grigory Fedyukovich and Aarti Gupta, Duration: 1 week

July 2019

Department of Computer Science, University of Sussex

Host: Peter Schrammel, Duration: 3 weeks

April 2016

Department of Computer Science, Oxford University

Host: Peter Schrammel and Daniel Kroening, Duration: 3 weeks

January 2016

Department of Computer Science, Oxford University

Host: Björn Wachter and Daniel Kroening, Duration: 3 weeks

June 2014

Miscellaneous Information

- Given several talks at the informal FM Update Meetings that happen in India every year, typically in the month of July.
- Sub-reviewer: FM 2019, ATVA 2017, APSEC 2015, ATVA 2013, ATVA 2012
- Gave four guest lectures at CMI, as part of the *Model Checking and Systems Verification* course, during Jan-Apr 2019.
- Member of the Curriculum Committee of CSpashshala, an education initiative of ACM India.