

Kumar Madhukar

Assistant Professor, IIT Delhi

☎ (+91) 956-146-0379 | ✉ madhukar@cse.iitd.ac.in | 🏠 <https://kumarmadhukar.github.io/>

Work Experience

IIT Delhi

ASSISTANT PROFESSOR

- A faculty member in the department of Computer Science and Engineering

New Delhi, India

Oct. 2021 - till date

TCS Research

SCIENTIST

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

Pune, India

July 2010 - Sept. 2021

SUMMER INTERN

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

May 2009 - Jun 2009

Valuepitch Interactive IT Services

M.Sc. THESIS/PROJECT

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

Mumbai, India

Jan 2008 - Jun 2008

SUMMER INTERN

- 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.

May 2007 - Jul 2007

Pinstorm Technologies

SUMMER INTERN

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

Mumbai, India

May 2006 - Jul 2006

Education

Chennai Mathematical Institute

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

- 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)

Chennai, India

Aug 2012 - Nov 2018

MASTER OF SCIENCE (M.Sc.) IN COMPUTER SCIENCE

Aug 2006 - Jul 2008

BACHELOR OF SCIENCE (B.Sc.) IN MATHEMATICS (HONS.) AND COMPUTER SCIENCE

Aug 2003 - Jul 2006

Publications

Learning DNN Abstractions using Gradient Descent

Diganta Mukhopadhyay, Sanaa Siddiqui, Hrishikesh Karmarkar, Kumar Madhukar, Guy Katz

NIER, ASE 2024

Unifying Syntactic and Semantic Abstractions for Deep Neural Networks

Sanaa Siddiqui, Diganta Mukhopadhyay, Mohammad Afzal, Hrishikesh Karmarkar, Kumar Madhukar

FMICS 2024

Efficient Adversarial Input Generation via Neural Net Patching Tooba Khan, Kumar Madhukar, Subodh Sharma	PRDC 2023
Automated Property Directed Self Composition Akshatha Shenoy, Sumanth Prabhu, Kumar Madhukar, Ron Shemer, Mandayam Srivas	ATVA 2023
Permutation Invariance of Deep Neural Networks with ReLUs Diganta Mukhopadhyay, Kumar Madhukar, Mandayam Srivas	NFM 2022
Specification Synthesis with Constrained Horn Clauses Sumanth Prabhu, Grigory Fedyukovich, Kumar Madhukar, Deepak D'Souza	PLDI 2021
Using Hypersafety Verification for Proving Correctness of Programming Assignments Jude Anil, Sumanth Prabhu, Kumar Madhukar, R. Venkatesh	NIER, ICSE 2020
Quantified Invariants via Syntax-Guided-Synthesis Grigory Fedyukovich, Sumanth Prabhu, Kumar Madhukar, Aarti Gupta	CAV 2019
Solving Constrained Horn Clauses Using Syntax and Data Grigory Fedyukovich, Sumanth Prabhu, Kumar Madhukar, Aarti Gupta	FMCAD 2018
Efficiently Learning Safety Proofs from Appearance as well as Behaviours Sumanth Prabhu, Kumar Madhukar, R. Venkatesh	SAS 2018
Generalizing specific-instance interpolation proofs with SyGuS Muqsit Azeem, Kumar Madhukar, R. Venkatesh	NIER, ICSE 2018
Compositional Safety Refutation Techniques Kumar Madhukar, Peter Schrammel, Mandayam Srivas	ATVA 2017
Sequentialization Using Timestamps Anand Yeolekar, Kumar Madhukar, Dipali Bhutada, R. Venkatesh	TAMC 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
Efficient Elimination of False Positives Using Bounded Model Checking Tukaram Muske, Advaita Datar, Mayur Khanzode, Kumar Madhukar	VALID 2013
Reachability Verification of Rhapsody Statecharts Kumar Madhukar, Ravindra Metta, Priyanka Singh, R. Venkatesh	TAIC PART Workshop, ICST, 2013
Trace Based Reachability Verification for Statecharts Kumar Madhukar, Ravindra Metta, Ulka Shrotri, R. Venkatesh	FormaliSE Workshop, ICSE, 2013

Miscellaneous Information

- Program Committee member: ATVA 2025, CAV 2024, ATVA 2024, VSTTE 2024
- Organising Committee member: SAT 2024, Indian SAT+SMT Schools, RHPL 2024
- Council member of the Indian Association for Research in Computing Science (IARCS)
- Member of the Curriculum Committee of CSpathshala, an education initiative of ACM India.