

Dhruv Nevatia

COMPUTER SCIENCE · STUDENT

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Personal

Born 21.05.1999; Kolkata, West Bengal, India

Languages English (Native), Hindi (Native), Bengali (Native), Marathi (Professional), German (Basic)

Education

ETH Zürich

PHD. IN COMPUTER SCIENCE

2022—

Chennai Mathematical Institute, India

M.Sc. IN COMPUTER SCIENCE

2020-2022

Chennai Mathematical Institute, India

B.Sc. (HON.) IN COMPUTER SCIENCE AND MATH

2017-2020

Past and ongoing research

Formal Analysis of DNS

DAVID BASIN

We focus on completely verifying zone file configurations against static vulnerabilities in DNS, using existing and new formal techniques.

ETH Zürich, Switzerland

Dec 2022 -

Policy Change

DAVID BASIN

It focuses on investigating and constructing a generic algorithm for allowing policy change in runtime monitoring applications.

ETH Zürich, Switzerland

Feb 2023 - Sep 2023

Coyote project

AKASH LAL

It focuses on improving existing algorithms for systematic testing of multi-thread shared memory programs in the Microsoft Coyote tool.

Microsoft Research, India

Aug 2021 - Feb 2022

Aperiodic Two-way Nested Weighted Automata and Full Weighted FO

BENJAMIN MONMEGE

It focuses on considering the full unrestricted fragment of weighted First-Order logic with binary products and right-left sequential products, and investigating an equivalent weighted automaton model for the same.

LIS, Marseille

Jun 2022 - Aug 2023

MSc Thesis

S. AKSHAY

It focuses on developing a graph semantics and appropriate logical characterization to capture the behaviour of register automata in a unified approach to reduce the emptiness problem of register automata to satisfiability of a logical formula. We look at restrictions of these structures to deduce decidability. We further look into a 2-way extension of the model with the same properties.

IIT, Bombay

Jan 2022 - Jun 2022

An algebraic approach to universal automaton

THOMAS COLCOMBET, DANIELA PETRISAN

We introduce a coarsest congruence on a new kind of bimachine to construct a quotient isomorphic to the universal automaton, a model primarily useful for construction (/approximation) of a minimal state NFA for a regular language among many other interesting properties. We further investigate the same in a categorical lens for languages over monad algebras.

IRIF, Paris

May 2020 - Aug 2020

A Characterisation of First-Order Logic with Neighbour

AMALDEV MANUEL

We propose a notion of variety for regular languages that are closed under the reverse operation. We first observe that there is an Eilenberg-type correspondence between our proposed notion of varieties and pseudovarieties of hermitian semigroups. As an application it is shown that the class *Weak Locally Threshold Testable*, those languages that are definable in first-order logic with adjacency predicate, corresponds to the locally-hermitian block product of the pseudovarieties \mathbf{Acom}^* and $\mathbf{L1}^b$.

IIT Goa

Jun 2019 - Feb 2020

Publications

An Automata Theoretic Characterization of Weighted First-Order Logic

WITH BENJAMIN MONMEGE, Accepted in **ATVA 2023**

Supervision and Teaching

2023	Teaching Assistant , Diskrete Mathematik	<i>ETH Zürich</i>
2023	BT Supervisor , Sümer Sarp, Implementing Timed Lossy Channel Systems in Haskell	<i>ETH Zürich</i>
2023	Teaching Assistant , Formal Methods and Functional Programming	<i>ETH Zürich</i>
2022	Teaching Assistant , Theoretische Informatik	<i>ETH Zürich</i>
2020	Teaching Assistant , Theory of Computation	<i>CMI</i>
2020	Teaching Assistant , Mathematical Logic	<i>CMI</i>
2019	Teaching Assistant , Introduction to Programming in Haskell	<i>CMI</i>
2018	Lecturer , Abstract Algebra course for JEST applicants	<i>CMI - ISc</i>

Technical Skills

Programming languages Haskell, Python, C++, C#, JAVA, Rust, F*

Tools Nekara, Coyote, Coq, NuSMV, Z3, CBMC, Cadical, Proverif, Cryptoverif