

# Jatin Arora

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## Education

**Carnegie Mellon University**, PhD Student, Computer Science Department 2019 - now  
Advisor: Umut A. Acar

**Indian Institute of Technology, Bombay**, BTech in Computer Science & Engineering 2015 - 2019  
Advisor: Supratik Chakraborty & S. Krishna

## Research Interests

Programming Languages, Compilers and Formal Methods

## Publications <sup>1</sup>

**Provably Space-Efficient Parallel Functional Programming** POPL 2021

*Jatin Arora, Sam Westrick, Umut A. Acar*

48th ACM SIGPLAN Symposium on Principles of Programming Languages

- Developed a provably efficient, fully distributed collection policy for fork-join based parallel programs
- Implemented a concurrent collector that improved space performance by over 85%
- Currently working on extending the policy to support futures and message-passing

**Knowledge compilation for boolean functional synthesis** FMCAD 2019

*S. Akshay, Jatin Arora, S. Chakraborty, S. Krishna, Divya Raghunathan, Shetal Shah*

Formal Methods in Computer Aided Design

- Developed a new canonical form that guarantees polynomial time synthesis of boolean functions
- Proved the succinctness of this form wrt other established forms like wDNNF, dDNNF, DNNF, FBDD, ROBDD
- Extended DSharp <sup>2</sup> to translate input specifications to this canonical form and synthesize skolem functions

**Verification of (parallel) programs under the release-acquire semantics** PLDI 2019

*Parosh Aziz Abdulla, Jatin Arora, Mohamed Faouzi Atig, S. Krishna.*

40th ACM SIGPLAN Conference on Programming Language Design and Implementation

- Assisted in proving **undecidability** of verifying programs when executed under **RA** semantics
- Designed an under-approximation that reduces to verification under sequentially consistent semantics
- Implemented a model checker based on the **Lazy Cseq** <sup>3</sup> framework to prove the effectiveness of the approximation in finding bugs

**Property Inference in ReLU nets using Linear Interpolants** VNN 2020

*Divyansh Pareek, Saket Dingliwal, Jatin Arora*

International **Workshop** on Verification of Neural Networks

- Developed a technique that leverages interpolation to aid verification of neural networks
- Currently working on verifying robustness by quantizing the input space wrt activation patterns

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<sup>1</sup>Abstracts & Papers are available at my [webpage](#)

<sup>2</sup>[https://tidel.mie.utoronto.ca/pubs/MuiseDSHARP\\_AI2012.pdf](https://tidel.mie.utoronto.ca/pubs/MuiseDSHARP_AI2012.pdf)

<sup>3</sup><https://www.southampton.ac.uk/~gp1y10/cseq/>