

# SUGUMAN BANSAL (she/her/hers)

Assistant Professor  
School of Computer Science  
Georgia Institute of Technology

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## EMPLOYMENT

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**Assistant Professor** in SCHOOL OF COMPUTER SCIENCE  
**Georgia Institute of Technology**, Atlanta, GA Jan. 23 - Present

**NSF/CRA Computing Innovation Postdoc.** in COMPUTER AND INFORMATION SC.  
**University of Pennsylvania**, Philadelphia, PA July. 20 - Aug. 22  
Mentor: Prof. Rajeev Alur

## EDUCATION

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**PhD** in COMPUTER SCIENCE, **Rice University**, Houston, TX Sept. 16 - June 20  
Thesis: [Automata-Based Quantitative Verification](#)  
Advisor: Prof. Moshe Y. Vardi

**MS** in COMPUTER SCIENCE, **Rice University**, Houston, TX Aug. 14 - Sept. 16  
Thesis: [Algorithmic Analysis of Regular Repeated Games](#)  
Advisor: Prof. Swarat Chaudhuri

**BSc (with Honors)** in MATHEMATICS and COMPUTER SCIENCE Aug. 11 - May 14  
**Chennai Mathematical Institute (CMI)**, Chennai, India

## ALL PUBLICATIONS

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Underlined names: Papers by students that I advise

**[Under Submission]** [Inductive Framework for Generalization in Reinforcement Learning for Specifications](#)  
Vignesh Subramanian, Rohit Kushwah, , Subajit Roy, Suguman Bansal  
[GenPlan 23] NeurIPS 2023 Workshop on Generalization in Planning

**[FMCAD 2024]** [DAG-Based Compositional Approaches for LTLf to DFA Conversions](#)  
Suguman Bansal, Yong Li, Yash Kankariya  
(To appear) Formal Methods in Computer-Aided Design (FMCAD) 2024

**[ICML 24]** [Reinforcement Learning from Reachability Specifications: PAC Guarantees with Expected Conditional Distance](#)  
Jakub Svoboda, Suguman Bansal, Krishnendu Chatterjee  
(To Appear) In Proc. of International Conference on Machine Learning (ICML) 2024

**[ATVA 23]** [Model-Checking Strategies From Synthesis over Finite-Horizon Tasks](#)  
Suguman Bansal, Yong Li, Lucas M. Tabajara, Moshe Y. Vardi, and Andrew Wells  
In Proc. of International Symposium on Automated Technology for Verification and Analysis (ATVA) 2023  
**Best Paper Award at ATVA 2023**

**[ACM SIGLOG News 23]** [Automata-Based Quantitative Reasoning](#)

Suguman Bansal  
In ACM SIGLOG News, Volume 10, Issue 3, July 2023

**[IJCAI 23]** [Multi-Agent Systems with Quantitative Satisficing Goals](#)

Senthil Rajasekaran, Suguman Bansal, and Moshe Vardi  
In Proc. of International Joint Conference on Artificial Intelligence (IJCAI) 2023

**[CAV 22]** [Specification-Guided Learning of Nash Equilibria with High Social Welfare](#)

Kishor Jothimurugan, Suguman Bansal, Osbert Bastani, and Rajeev Alur  
In Proc. of International Conference on Computer-Aided Verification (CAV) 2022

**[AAAI 22]** [On Synthesis from Satisficing and Temporal Goals](#)

Suguman Bansal, Lydia Kavraki, Moshe Y. Vardi, and Andrew Wells  
In Proc. of AAAI Conference on AI (AAAI) 2022

**[Henzinger-60]** [A Framework for Transforming Specifications in Reinforcement Learning](#)

Rajeev Alur, Suguman Bansal, Osbert Bastani, and Kishor Jothimurugan  
In Proc. of Principles of System Design 2022

**[SAS 22]** [Specification-Guided Reinforcement Learning](#)

Suguman Bansal  
In Proc. of Static Analysis Symposium (SAS) 2022

**Keynote Speaker Address**

**[VSTTE 22]** [Compositional Safety LTL Synthesis](#)

Suguman Bansal, Giuseppe De Giacomo, Antonio Di Stasio, Yong Li, Moshe Vardi, and Shufang Zhu  
In Proc. of International Conference on Verified Software: Theories, Tools, and Experiments (VSTTE) 2022

**[LMCS 22]** [Comparator Automata in Quantitative Verification](#)

Suguman Bansal, Swarat Chaudhuri, and Moshe Y. Vardi  
In Journal of Logical Methods in Computer Science (LMCS) 2022

**[NeurIPS 21]** [Compositional Reinforcement Learning from Logical Specifications](#)

Kishor Jothimurugan, Suguman Bansal, Osbert Bastani, and Rajeev Alur  
In Proc. of Advances in Neural Information Processing Systems (NeurIPS) 2021

**[CAV 21]** [Adapting Behaviors via Reactive Synthesis](#)

Gal Araman, Suguman Bansal, Dror Fried, Lucas M. Tabajara, Moshe Y. Vardi, and Gera Wiess  
In Proc. of International Conference on Computer-Aided Verification (CAV) 2021

**[TACAS 21]** [On Satisficing in Quantitative Games](#)

Suguman Bansal, Krishnendu Chatterjee, and Moshe Y. Vardi  
In Proc. of Int. Conf. on Tools and Algorithms for the Construction and Analysis of Systems (TACAS) 2021

**[AAAI 20]** [Hybrid Compositional Reasoning for Reactive Synthesis from Finite-Horizon Specifications](#)

Suguman Bansal, Yong Li, Lucas M. Tabajara, and Moshe Y. Vardi  
In Proc. of AAAI Conference on AI (AAAI) 2020

**[POPL 20]** [Synthesis of Coordination Programs from Linear Temporal Specifications](#)

Suguman Bansal, Kedar S. Namjoshi, and Yaniv Sa'ar  
In Proc. of the ACM on Programming Languages (POPL), 2020

**[CAV 19]** [Safety and Co-safety Comparator Automata for Discounted-Sum Inclusion](#)

Suguman Bansal and Moshe Y. Vardi

In Proc. of International Conference on Computer-Aided Verification (CAV) 2019

**[CAV 18]** [Automata vs Linear-Programming Discounted-Sum Inclusion](#)

Suguman Bansal, Swarat Chaudhuri, and Moshe Y. Vardi

In Proc. of International Conference on Computer-Aided Verification (CAV) 2018

**[CAV 18]** [Synthesis of Asynchronous Reactive Programs from Temporal Specifications](#)

Suguman Bansal, Kedar S. Namjoshi, and Yaniv Sa'ar

In Proc. of International Conference on Computer-Aided Verification (CAV) 2018

**[FoSSaCS 18]** [Comparator Automata in Quantitative Verification](#)

Suguman Bansal, Swarat Chaudhuri, and Moshe Y. Vardi

In Proc. of Int. Conf. on Foundations of Software Science and Computation Structures (FoSSaCS) 2018

## TUTORIALS

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**[AAAI 23]** [Specification-Guided Reinforcement Learning](#)

Co-presented with Rajeev Alur, Osbert Bastani, and Kishor Jothimurugan at AAAI 23

## OPEN SOURCE TOOLS

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**Lisa** | [Github Link](#)

Reactive synthesis for finite-horizon tasks and efficient DFA generation from logical formulas

[3rd place in LTLf Track of SYNTCOMP 2023](#) [Results]

**DiRL** | [Github Link](#)

Compositional reinforcement learning from temporal specifications

## ADVISING

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### PhD Students

[1] Vignesh Subramanian (Georgia Tech) Aug. 23 - Present

Topic: Generalizable Reinforcement Learning from Logical Specifications

### Masters Students

[2] Kaushik Arcot (Georgia Tech) Jan 24 - Present

### Alumni

[3] Ramneet Singh, Undergraduate + Masters (IIT Delhi) April 23 - April 24

- Predoctoral Fellow, Microsoft Research India

[4] Yash Kankariya, Undergraduate (Georgia Tech) April 23 - Dec 23

- Next Stop: MS (with Research), Stanford University
- (FMCAD 2024) DAG-Based Compositional Approaches for LTLf to DFA Conversions
- (AAAI 24 Student Abstract) Decompositions in Compositional Translation of LTLf to DFA
- Georgia Tech's President's Undergraduate Research Award (PURA) for Fall 2023

## TEACHING

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## CS 8803. Logic in Computer Science

Fall 23, Georgia Tech Overall Course Effectiveness 4.4/5, Overall Lecturer Effectiveness 4.7/5

## CS 4510. Automata and Complexity

Spring 24, Georgia Tech Overall Course Effectiveness 4.5/5, Overall Lecturer Effectiveness 5/5

Spring 23, Georgia Tech (Hon.) Overall Course Effectiveness 4.7/5, Overall Lecturer Effectiveness 4.7/5

### (Anonymous) Student Testimonials

- “Looking back, I remember the automata class quite fondly ... To be honest, at first I resented the structure of the class, with mandatory attendance and no devices. It felt a bit patronizing, like a return to high school to pass the time (I think I can finally admit to this now). I don't know if you noticed, but I would write notes on a sheet of paper. I still have them, and they make me smile when I look at them. I don't have the bandwidth to attend many classes, usually 1-2 per semester these days, but I have to admit being compelled to go to class helps with learning the material.”
- “The best part, according to me, is that the instructor encourages participation. We spent as much time on a topic as was required to get the entire class up to speed, not what was allocated.”
- “This class was the first time at GT that I've been in a small class and have had this level of professor interaction. Lectures were exceptionally good, maybe the best I've taken here. I really enjoyed how the class took tangents to explore problems from different angles while still staying relevant.”

### FUNDING

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<b>IIT-Bombay/GaTech Collaboration</b> PI: S. Akshay, Suguman Bansal, <b>INR 1000000 (~ USD 12000)</b>	Jan. 24 - Dec. 24
<b>CRA/NSF Computing Innovation Fellow Award</b> PI: Rajeev Alur, <b>USD 240,910</b>	Sept. 20 - Aug. 22

### AWARDS

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<b>Best Paper Award, ATVA 2023</b>	2023
<b>Thank-a-Teacher Certificate</b> GaTech's official certificate presented by individual students to show their appreciation to a teacher	Fall 2023
<b>MIT EECS Rising Star</b>	2021, 2018
<b>CRA Computing Innovation (CI) Fellow</b> Awarded by the CRA and NSF for postdoctoral research	2020
<b>Future Faculty Fellow</b> Awarded by the School of Engineering, Rice University	2019
<b>Rice Engineering Alumni Graduate Grant</b> Awarded by the Rice Engineering Alumni to one graduate student each year	2017
<b>Gold Medal at the ACM Student Research Competition at POPL 2016</b>	2016
<b>Andrew Ladd Graduate Fellowship</b> Awarded by the Rice CS Department and Ken Kennedy Institute for excellence in CS	2015
<b>CMI Undergraduate Scholarship</b> Awarded by CMI to undergraduate students for excellence in academics	2011 - 2014
<b>KVPY Science Fellowship (Govt. of India)</b> Awarded by the Ministry of Science and Technology, Govt. of India, for excellence in Basic Sciences	2008

## Travel grants

AAAI Scholarship (2020), SIGPLAN PAC Travel Grant POPL (2020), CAV Student Travel Fellowship (2019), Rice Dean's Travel Award (2019), WiL SIGLOG/VCLA Travel Award (2019, declined), MIT EECS Rising Stars Travel Grant (2018), NSF-CAV/VMW Travel Grant (2015, 2018), ETAPS Student Scholarship (2018), Google Student Research Summit Travel Grant (2017), LMW-LICS Scholarship (2017, declined), CRA-W Grad Cohort Graduate Grant (2017), ACM SRC (POPL) Travel Grant (2016), MSR Faculty Summit Travel Grant (2016), Off The Beaten Track Travel Grant (2016), MSR Summer School Travel Grant (2012)

## HONORS

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<b>Invited Speaker</b> at 44th Conference on FSTTCS 2024	Dec. 24
<b>Keynote Speaker</b> at 29th Symposium of Static Analysis (SAS) 2022	Dec. 22
Invited to <b>Dagstuhl Seminar</b> on Automated Synthesis: Functional, Reactive and Beyond	April 24
Invited to <b>Dagstuhl Seminar</b> on Scalable Analysis of Probabilistic Models and Programs	June 23
Invited to <b>Simons Institute</b> for program on Real-Time Decision Making	Spring 18
Invited to <b>Google Student Research Summit 2017</b>	Sept. 17
Invited to <b>Dagstuhl Seminar</b> on Game Theory, AI, Logic and Algorithms	March 17
Invited to <b>MSR Faculty Summit 2016</b>	July 16

## RESEARCH VISITS

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<b>National University of Singapore</b> Visiting Faculty Host: Prof. Umang Mathur	May 23
<b>NOKIA Bell Labs</b> , Murray Hill, New Jersey, USA Research Intern Mentor: Dr. Kedar S. Namjoshi	June 18 - July 18
<b>Simons Institute, University of California - Berkeley</b> , California, USA Visiting Graduate Student Spring 2018 program on Real-Time Decision Making	March 18 - May 18
<b>NOKIA Bell Labs</b> , Murray Hill, New Jersey, USA Research Intern Mentors: Dr. Kedar S. Namjoshi and Dr. Michael Emmi	June 17 - Aug. 17

## RESEARCH TALKS

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### Model Checking Finite-Horizon Properties

Dagstuhl Seminar on "Automated Synthesis: Functional, Reactive and Beyond"	April 24
PLSE Seminar, National University of Singapore (NUS)	May 23

### Formal Reasoning in Reinforcement Learning: A Boon or Bane

[INVITED] Center of Signal Processing (CSIP), GaTech	Oct. 2023
EECS, UC Berkeley	April 23
[KEYNOTE] Static Analysis Symposium (SAS) 2022	Dec. 22

### Reinforcement Learning from Logical Specifications

Dagstuhl Seminar on "Scalable Analysis of Probabilistic Models and Programs"	June 23
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Department of Computer Science - IIT Delhi	Oct. 22
[INVITED] Workshop on Open Problems in Learning and Verification of Neural Networks	Aug. 22
<b>Specification-Guided Policy Synthesis</b>	Jan. 22 - April 22
[INVITED] Carnegie Mellon University, CISPA Saarland, ETH Zurich, Georgia Institute of Technology, IST Austria, Max Plank Institute - SWS, National University of Singapore, New York University, Pennsylvania State University, Purdue University, Tufts University, TU Graz, University of Illinois - Chicago, University of Southern California, University of Toronto, University of Waterloo (ECE), Washington University at St. Louis, Yale University	
<b>Reactive Synthesis from Quantitative Constraints: An Automata Approach</b>	
[INVITED] IARCS Verification Seminar Series	Oct. 21
[INVITED] Workshop on Continuity, Computability, Constructivity: From Logic to Algorithms	Sep. 21
<b>Compositional Reinforcement Learning from Logical Specifications</b>	
[INVITED] Sapienza University of Rome	June 21
<b>Reactive Synthesis for Coordination</b>	
[INVITED] Simons Institute (UC Berkeley): Workshop on Synthesis of Models and Systems	March 21
<b>On Satisficing in Quantitative Games</b>	
Hebrew University	June 21
[INVITED] Formal Methods Seminar, Ben Gurion University	March 21
<b>Designing Intelligent Machines Via Reactive Synthesis</b>	
[INVITED] Machine Learning Seminar Series, Rice University	March 20
[INVITED] ICES, University of Texas at Austin	Feb. 20
Nokia Bell Labs, Murray Hill	Feb. 20
Department of Computer Science - IIT Delhi	April 19
School of Computing, National University of Singapore	April 19
<b>Automata-Based Quantitative Reasoning</b>	
[INVITED] Department of Computer Science, University of Pennsylvania	Jan. 20
Verification Seminar Series, University of Oxford	Nov. 19
[INVITED] RiSE Seminar, IST Austria	April 18
<b>Comparators for Quantitative Verification</b>	
University of California, Berkeley	April 18
Student Spotlight, Winter School in CS and Eng.on Formal Methods, IIAS, Jerusalem	Dec. 17
[INVITED] Saarland University	March 17
[INVITED] Dagstuhl Seminar on Game Theory in AI, Logic and Algorithms,	March 17
<b>Asynchronous synthesis: The Ugly, the Bad and the ?</b>	
Application Platforms and Software Systems Group, Nokia Bell Labs, Murray Hill	July 17
<b>Reasoning About Incentive Compatibility</b>	

## Conference and Workshop Presentations

AAAI-SSS 2023, ATVA 2023, Highlights of Logic, Games, and Automata 2023, AAAI 2022, NeurIPS 2021, Highlights of Logic, Games, and Automata 2021, SYNT 2021, TACAS 2021, Highlights of Logic, Games, and Automata 2020, AAAI 2020, POPL 2020, CAV 2019, SYNT 2019, CAV 2018 (a), CAV 2018 (b), FoSSaCS 2018, Off the Beaten Track 2016, ACM Student Research Competition at POPL 2016

## SERVICE

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### RESEARCH COMMUNITY

**NSF Panel** 2024 | 2023

### Organizing Committee

**Co-Chair.** AAAI Spring Symposium Series 2023: On the Effectiveness of Temporal Logics on Finite Traces

**Co-Organizer.** Verification Mentoring Workshop @ CAV 2021

### Program Committee

**2024.** AAAI 2024, CAV 2024, NeurIPS 2024, POPL 2024, TACAS 2024, Women in Logic (WiL) 2024

**2023.** AAAI 2023, CAV 2023, CONCUR 2023, ESOP 2023, Highlights of Automata, Logic, and Games 2023, Nasa FM 2023, NeurIPS 2023

**2022.** GandALF 2022, SYNT 2022

**2021.** IJCAI 2021, LAMAS&SR 2021, SPLASH SRC 2021, SYNT 2021

### Thesis Committee

Ritam Raha (University of Antwerp, University of Bordeaux). PhD. August 2023  
Thesis title: Verification of Complex Systems against Learnt Specifications

Guy Hefetz (ITC Herzila). Masters. April 2020  
Thesis title: Discounted-sum automata with multiple discount factors

### Journal Reviewer

**2023** LMCS

**2022.** Foundations and Trends in TCS, Henzinger-60

**2021.** ACM ToCL, FMSD, JACM, LMCS

**2020.** Acta Informatica

### Conference Reviewer

**2023.** FoSSaCS 2023, L4DC 2023    **2021.** FMCAD 2021, FOCS 2021    **2020.** CONCUR 2020, ICALP 2020, IJCAI 2020    **2019.** ISAAC 2019    **2018.** FSTTCS 2018, LPAR 2018    **2017.** CP 2017, TACAS 2017  
**2016.** IJCAI 2016

**Artifact Evaluation Committee 2021.** CAV 2021, SAS 2021