

# SUGUMAN BANSAL (she/her/hers)

NSF/CRA CI Postdoctoral Fellow

Dept. of Computer and Information Sciences  
University of Pennsylvania

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## EMPLOYMENT

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**Postdoctoral Researcher** in COMPUTER AND INFORMATION SCIENCES

July 20 - Present

**NSF/CRA Computing Innovation (CI) Fellow**

Sept. 20 - Present

**University of Pennsylvania**, Philadelphia, PA

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

## PUBLICATIONS

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

Kishor Jothimurugan, Suguman Bansal, Osbert Bastani, and Rajeev Alur

**[Under Review]** [A Framework for Transforming Specifications in Reinforcement Learning](#)

Rajeev Alur, Suguman Bansal, Osbert Bastani, and Kishor Jothimurugan

### Refereed Conference Publications

\*\* 8/10 accepted publications at premier venues identified by CSRankings with adjusted author score of 2.4

**[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

**[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

Awarded [Artifact Evaluation Badge - Available, Functional, and Reusable](#)

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

Suguman Bansal, Krishnendu Chatterjee, and Moshe Y. Vardi

In Proc. of International Conference 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/PACML 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 (PACMPL), Issue POPL, 2020

Awarded **ACM Artifact Evaluated Badge - Functional**

**[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 International Conference on Foundations of Software Science and Computation Structures (FoSSaCS) 2018

**(Selected) Refereed Workshop Papers and Posters**

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

Kishor Jothimurugan, Suguman Bansal, Osbert Bastani, and Rajeev Alur

Workshop on Safe and Robust Control of Uncertain Systems (SafeRL) 2021 at NeurIPS 2021

**[Co-ordination Synthesis](#)**

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

Workshop on Synthesis (SYNT) 2019 co-located with CAV 2019

**[Reasoning about Incentive Compatibility](#)**

Suguman Bansal

ACM Student Research Competition 2016 at POPL 2016

Awarded **Gold Medal at the ACM SRC at POPL 2016**

**OPEN SOURCE TOOLS**

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**Lisa** | Github Link

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

**DiRL** | Github Link

Compositional reinforcement learning from temporal specifications

## GRANT WRITING EXPERIENCE

**CRA/NSF Computing Innovation Fellow Award**  
PI: Rajeev Alur, **USD 240,910**

Sept. 20 - Aug. 22

## AWARDS

<b>MIT EECS Rising Star</b>	2021
<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>MIT EECS Rising Star</b> Awarded to ~50 women graduate students in electrical engineering and computer science	2018
<b>Rice Engineering Alumni Graduate Grant</b> Awarded by the Rice Engineering Alumni (REA) 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
<b>Travel grants</b> 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

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

<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

## RESEARCH TALKS

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### **Reactive Synthesis from Quantitative Constraints: An Automata Approach**

[INVITED] IARCS Verification Seminar Series Oct. 21

[INVITED] Workshop on Continuity, Computability, Constructivity: From Logic to Algorithms Sep. 21

### **Compositional Reinforcement Learning from Logical Specifications**

Kavraki Lab, Rice University (Upcoming) 2022

[INVITED] Sapienza University of Rome June 21

### **Reactive Synthesis for Coordination**

PL Club, University of Pennsylvania April 21

[INVITED] Simons Institute (UC Berkeley): Workshop on Synthesis of Models and Systems March 21

### **On Satisficing in Quantitative Games**

Hebrew University June 21

[INVITED] Formal Methods Seminar, Ben Gurion University March 21

### **Designing Intelligent Machines Via Reactive Synthesis**

[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

### **Automata-Based Quantitative Reasoning**

[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

### **Comparators for Quantitative Verification**

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

### **Asynchronous synthesis: The Ugly, the Bad and the ?**

Application Platforms and Software Systems Group, Nokia Bell Labs, Murray Hill July 17

### **Reasoning About Incentive Compatibility**

[INVITED] Google Student Research Summit, YouTube Headquarters, San Bruno Sept. 17

## Conference/Workshop Presentations (from publications)

NeurIPS 2021, <i>Virtual</i>	(Upcoming) Dec. 21
Highlights of Logic, Games, and Automata, <i>Virtual</i>	Sept. 21
SYNT 2021, <i>Virtual</i>	July 21
TACAS 2021, <i>Virtual</i>	April 21
Highlights of Logic, Games, and Automata, <i>Virtual</i>	Sept. 20
AAAI 2020, <i>New York City, USA</i>	Feb. 20
POPL 2020, <i>New Orleans, USA</i>	Jan. 20
CAV 2019, <i>New York City, USA</i>	July 19
SYNT 2019, <i>New York City, USA</i>	July 19
CAV 2018 (a), <i>Oxford, UK</i>	July 18
CAV 2018 (b), <i>Oxford, UK</i>	July 18
FoSSaCS 2018, <i>Thessaloniki, Greece</i>	April 18
Off the Beaten Track 2016, <i>St. Petersburg, USA</i>	Jan. 16
ACM Student Research Competition at POPL 2016, <i>St. Petersburg, USA</i>	Jan. 16

## TEACHING EXPERIENCE

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### Guest Lecturer

Logic in Computer Science (Moshe Y. Vardi, COMP 409/509)	Fall 18, Fall 19
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### Teaching Assistant

Statistical Machine Learning (Devika Subramanian, COMP 540, ~100 students)	Spring 17
Reasoning about Algorithms (Swarat Chaudhuri, COMP 382, ~50 students )	Fall 16
Design and Analysis of Algorithms (Krishna Palem, COMP 582, ~80 students)	Fall 15
Automata, Formal Languages, and Computability (Michael Burke, COMP 481)	Spring 15, Spring 16

## MENTORING EXPERIENCE

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### Graduate Student Mentoring

Kishor Jothimurugan, PhD Student, University of Pennsylvania Topic: Reinforcement Learning from Formal Specifications	Sept. 20-Present
Senthil Rajasekaran, PhD Student, Rice University Topic: Multi-Agent Games with Quantitative Objectives	Jan. 21-Present

### Outreach and Mentoring

#### Co-Organizer, Verification Mentoring Workshop @ CAV 2021

VMW provided mentorship to ~**100 students** worldwide through a series of technical and mentoring talks by domain experts, interactive panels, one-on-one mentorship, and scholarship to attend VMW and CAV (the flagship conference in Formal Methods)

Attracted participation from ~**30% female** and ~**30% undergraduate** students

## PROFESSIONAL SERVICE

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### RESEARCH COMMUNITY

#### **Program Committee**

**2022.** GandALF 2022, SYNT 2022   **2021.** ACM SPLASH SRC 2021, IJCAI 2021, LAMAS&SR 2021, SYNT 2021

#### **Artifact Evaluation Committee**

**2021.** CAV 2021, SAS 2021

#### **Thesis Committee**

Guy Hefetz (ITC Herzila). Master's Degree. April 2020

Thesis title: Discounted-sum automata with multiple discount factors

#### **Journal Reviewer**

**2022.** Henzinger-60   **2021.** ACM ToCL, FMSD, JACM, LMCS   **2020.** Acta Informatica

#### **Conference Reviewer**

**2022.** FoSSaCS 2022   **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

### DEPARTMENT LEVEL

- Colloquium Coordinator, Dept. of Computer Science, Rice University (2015-2016)
- Academic Coordinator, Rice Computer Science Graduate Student Association (2015-2016)

### UNIVERSITY/INSTITUTE LEVEL

- Judge, Rice Undergraduate Research Symposium, Rice University (2016)
- Publicity Coordinator, Indian Students at Rice (ISAR) (2015-2016)

## REFEREES

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#### **Prof. Rajeev Alur**

Zisman Family Professor

Department of Computer and Information Science

University of Pennsylvania, USA

Email: alur@seas.upenn.edu

#### **Prof. Moshe Y. Vardi**

University Professor

Karen Ostrum George Distinguished Service Professor

Department of Computer Science

Rice University, USA

Email: vardi@cs.rice.edu

#### **Prof. Swarat Chaudhuri**

Associate Professor

Department of Computer Science

University of Texas at Austin, USA

Email: swarat@cs.utexas.edu

**Prof. Giuseppe De Giacomo**

Full Professor

Department of Computer, Automation, and Management Engineering

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**Dr. Kedar Namjoshi**

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