SUGUMAN BANSAL (she/her/hers)

NSF/CRA CI Postdoctoral Fellow
Dept. of Computer and Information Sciences
University of Pennsylvania

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EMPLOYMENT

Postdoctoral Researcher in COMPUTER AND INFORMATION SCIENCES — July 2020-Present
NSF/CRA Computing Innovation (CI) Fellow — Sept. 2020-Present
University of Pennsylvania, Philadelphia, PA
Mentor: Prof. Rajeev Alur

EDUCATION

PhD in COMPUTER SCIENCE, **Rice University**, Houston, TX — Sept. 2016-June 2020
Thesis: Automata-Based Quantitative Verification
Advisor: Prof. Moshe Y. Vardi

MS in COMPUTER SCIENCE, **Rice University**, Houston, TX — Aug. 2014-Sept. 2016
Thesis: Algorithmic Analysis of Regular Repeated Games
Advisor: Prof. Swarat Chaudhuri

BSc (with **Honors**) in MATHEMATICS and COMPUTER SCIENCE — Aug. 2011-May 2014
Chennai Mathematical Institute (CMI), Chennai, India

PUBLICATIONS

[Under Submission] **On Synthesis from Satisficing and Temporal Goals**
Suguman Bansal, Lydia Kavraki, Moshe Y. Vardi, and Andrew Wells

[Under Submission] **Specification-Guided Learning of Nash Equilibria with High Social Welfare**
Kishor Jothimurugan, Suguman Bansal, Osbert Bastani, and Rajeev Alur

[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
Open source tool **Lisa**: https://github.com/vardigroup/lisa

[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

Compositional Reinforcement Learning from Logical Specifications
Kishor Jothimurugan, Suguman Bansal, Osbert Bastani, and Rajeev Alur
Workshop on Synthesis (SYNT) 2021 co-located with CAV 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

ArXived

Equilibria in Quantitative Concurrent Games
Shaull Almagor, Rajeev Alur, and Suguman Bansal

AWARDS

EECS Rising Star 2021

CRA Computing Innovation (CI) Fellow 2020
Awarded by the CRA and NSF for postdoctoral research

Future Faculty Fellow 2019
Awarded by the School of Engineering, Rice University

EECS Rising Star 2018
Awarded to ∼50 women graduate students in electrical engineering and computer science

Rice Engineering Alumni Graduate Grant 2017
Awarded by the Rice Engineering Alumni (REA) to one graduate student each year

Gold Medal at the **ACM Student Research Competition** at **POPL 2016** 2016

Andrew Ladd Graduate Fellowship 2015
Awarded by the Rice Computer Science Department and Ken Kennedy Institute for excellence in Computer Science

CMI Undergraduate Scholarship 2011 - 2014
Scholarship awarded by CMI to undergraduate students for excellence in academics

KVPY Science Fellowship (Govt. of India) 2008
Awarded by the Ministry of Science and Technology, Government of India, for excellence in Basic Sciences

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)

GRANT WRITING EXPERIENCE

CRA/NSF Computing Innovation Fellow Award PI: Rajeev Alur, USD 240,910, 9/20–8/22

HONORS

Invited to **Simons Institute** for program on Real-Time Decision Making (March - May 2018)

Invited to **Google Student Research Summit 2017** (September 2017)

Invited to **Dagstuhl Seminar** on Game Theory, AI, Logic and Algorithms (March 2017)

Invited to **MSR Faculty Summit 2016** (July 2016)

RESEARCH VISITS

NOKIA Bell Labs, Murray Hill, New Jersey, USA June 2018 - July 2018
Research Intern
Mentor: Dr. Kedar S. Namjoshi

Simons Institute, University of California - Berkeley, California, USA March 2018-May 2018
Visiting Graduate Student
Spring 2018 program on Real-Time Decision Making

NOKIA Bell Labs, Murray Hill, New Jersey, USA June 2017 - Aug. 2017
Research Intern
Mentors: Dr. Kedar S. Namjoshi and Dr. Michael Emmi

RESEARCH TALKS

Reactive Synthesis from Quantitative Constraints: An Automata Approach

[INVITED] IARCS Verification Seminar *(Upcoming)* — Oct. 21

Compositional Reinforcement Learning from Logical Specifications

[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] Continuity, Computability, Constructivity: From Logic to Algorithms — Sep. 21

[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)

HIGHLIGHTS of Logic, Games, and Automata, *Virtual* — Sept. 21

SYNT 2021, *Virtual* — July 21

TACAS 2021, *Virtual* — April 21

HIGHLIGHTS of Logic, Games, and Automata, *Virtual* Sept. 20

AAAI 2020, *New York City, USA* Feb. 20

POPL 2020, *New Orleans, USA* Jan. 20

CAV 2019, *New York City, USA* July 19

SYNT 2019, *New York City, USA* July 19

CAV 2018 (a), *Oxford, UK* July 18

CAV 2018 (b), *Oxford, UK* July 18

FoSSaCS 2018, *Thessaloniki, Greece* April 18

Off the Beaten Track 2016, *St. Petersburg, USA* Jan. 16

ACM Student Research Competition at POPL 2016, *St. Petersburg, USA* Jan. 16

TEACHING EXPERIENCE

Guest Lecturer

Logic in Computer Science (Moshe Y. Vardi, COMP 409/509) Fall 2019

Logic in Computer Science (Moshe Y. Vardi, COMP 409/509) Fall 2018

Teaching Assistant

Statistical Machine Learning (Devika Subramanian, COMP 540, $\sim$100 students) Spring 2017

- Revision classes
  - Initiated, organized, and conducted bi-monthly revision classes on course lectures.
  - Frequency increased to 3-4 times a month on popular student demand.
  - *Lasting impact*: Revision classes are now a permanent feature of the course.
- Course management, assignment grading, weekly TA office hours for students etc.

Reasoning about Algorithms (Swarat Chaudhuri, COMP 382, $\sim$50 students) Fall 2016

- Conducted weekly Lab sessions for additional problem solving and proof writing practice.
- Assignment and homework grading, weekly TA office hours for students.

Design and Analysis of Algorithms (Krishna Palem, COMP 582, $\sim$80 students) Fall 2015

- Organize, prepare and proof read course lecture material, assignments, exams etc.
- Conduct assignment and exam solution sessions

Automata, Formal Languages, and Computability (Michael Burke, COMP 481) Spring 2015-16

- Involved in course creation - structure of lectures and topics, assignments, exams etc.
- Assignment and exam grading, weekly TA office hours for students.
- *Impact:* Increase in student enrollment by $\sim$100$\%$ from Spring 15 to Spring 16.

MENTORING EXPERIENCE

Graduate Student Mentoring

- Kishor Jothimurugan, PhD Student, University of Pennsylvania Sept. 2020-Present

  Topic: Reinforcement Learning from Formal Specifications

- Senthil Rajasekaran, PhD Student, Rice University Jan. 2021-Present

  Topic: Multi-Agent Games with Quantitative Objectives

Outreach and Mentoring

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

  VMW provided mentorship to $\sim$**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 $\sim$**30% female** and $\sim$**30% undergraduate** students

PROFESSIONAL SERVICE

RESEARCH COMMUNITY

Thesis Committee

- Guy Hefetz (ITC Herzila). Master's Degree. *Discounted-sum automata with multiple discount factors*. April 2020.

Program Committee

- ACM SIGPLAN Conference on Systems, Programming, Languages, and Applications: Software for Humanity - Student Research Competition (SPLASH SRC) 2021
- International Joint Conference on Artificial Intelligence (IJCAI) 2021
- International Workshop on Logical Aspects in Multi-Agent Systems and Strategic Reasoning (LAMAS&SR) 2021
- Workshop on Synthesis (SYNT) 2021

Artifact Evaluation Committee

- Computer Aided Verification Artifact Evaluation (CAV-AE) 2021
- Static Analysis Symposium Artifact Evaluation (SAS-AE) 2021

Journal Reviewer

2021. ACM Transactions on Computational Logic (ACM ToCL)

Formal Methods and System Design (FMSD)

Journal of the ACM (JACM)

Logical Methods in Computer Science (LMCS)

2020. Acta Informatica

Conference Reviewer

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

@ Rice

- Judge, Rice Undergraduate Research Symposium, Rice University (2016)
- Publicity Coordinator, Indian Students at Rice (ISAR) (2015-2016)
- Advertising Coordinator, 90 Second Thesis Competition, Rice University (2015)