Suguman Bansal

Postdoctoral Researcher

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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

[1] **Adapting Behaviors via Reactive Synthesis**
Gal Araman, Suguman Bansal, Dror Fried, Lucas M. Tabajara, Moshe Y. Vardi, and Gera Wiess
(To appear) In Proc. of International Conference on Computer-Aided Verification (CAV) 2021

[2] **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

[3] **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

[4] **Synthesis of coordination programs from linear temporal specifications**
Suguman Bansal, Kedar S. Namjoshi, and Yaniv Sa'ar
In Principles of Programming Languages (POPL) 2020
Awarded ACM Artifact Evaluated Badge - Functional

[5] **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

[6] **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

[7] **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

[8] **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

In preparation

[9] **Compositional Reinforcement Learning from Logical Specifications**
Kishor Jothimurugan, Suguman Bansal, Osbert Bastani, and Rajeev Alur

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

[11] **Anytime Discounted-sum Inclusion**
Suguman Bansal and Moshe Y. Vardi

Selected refereed workshop papers and posters

[12] **Automata-Based Quantitative Reasoning**
Suguman Bansal
HIGHLIGHTS of Logic, Games and Automata 2020

[13] **Co-ordination synthesis**
Suguman Bansal, Kedar S. Namjoshi, and Yaniv Sa'ar
Workshop on Synthesis (SYNT) 2019 co-located with CAV 2019

[14] **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

[15] **Equilibria in quantitative concurrent games**
Shaull Almagor, Rajeev Alur, and Suguman Bansal

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

AWARDS

- **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
  Fellowship 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)

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 TALKS

Invited Talks

[1] Reactive Synthesis for Coordination. *Workshop on Synthesis of Models and Systems, Simons Institute, UC Berkeley/Virtual, March 2021*

[2] Designing intelligent machines via reactive synthesis. *Machine Learning Seminar Series, Rice University, Houston, March 2020*

[3] Designing intelligent machines via reactive synthesis. *ICES, University of Texas at Austin, Austin, February 2020*

[4] Automata-based quantitative reasoning. *Department of Computer Science, University of Pennsylvania, Philadelphia, January 2020*

[5] Comparator automata for quantitative verification. *RiSE Seminar, IST Austria, April 2018*

[6] Reasoning about incentive compatibility. *Google Student Research Summit, YouTube Headquarters, San Bruno, CA, USA, September 2017*

[7] Comparators for quantitative games. *Saarland University, Saarbrüken, Germany, March 2017*

Seminar Talks

[8] On Satisficing in Quantitative Games. *Formal Methods Seminar, Hebrew University, Israel/Virtual, June 2021* (Upcoming)

[9] Compositional Reinforcement Learning from Logical Specifications. *Sapienza University of Rome, Italy/Virtual, June 2021* (Upcoming)

[10] On Satisficing in Quantitative Games. *Formal Methods Seminar, Ben Gurion University, Israel/Virtual, March 2021*

[11] Designing intelligent machines via reactive synthesis. *Nokia Bell Labs, Murray Hill, USA, Feb. 2020*

[12] Automata-based quantitative verification. *Verification Seminar Series, University of Oxford, Oxford, November 2019*

[13] Designing intelligent machines via reactive synthesis. *Department of Computer Science - IIT Delhi, Delhi, April 2019*

[14] Designing intelligent machines via reactive synthesis. *School of Computing, National University of Singapore, Singapore, April 2019*

[15] Comparator automata in quantitative verification. *University of California, Berkeley, April 2018*

[16] Comparators for quantitative games. *Student Spotlight, 2nd Winter School in Computer Science and Engineering on Formal Methods, IIAS, Jerusalem, Israel, December 2017*

[17] Asynchronous synthesis: The Ugly, the Bad and the ? *Aplication Platforms and Software Systems Group, Nokia Bell Labs, Murray Hill, NJ, USA, July 2017*

[18] Comparators for quantitative games. *Dagstuhl Seminar on Game Theory in AI, Logic and Algorithms, Dagstuhl, Germany, March 2017*

[19] Reasoning about Selfishness. *Jawaharlal Nehru University, New Delhi, India, December 2016*

[20] Algorithmic Analysis of Regular Repeated Games. *Rice University, April 2016*

[21] Reasoning about Incentive Compatibility. *ACM Student Research Competition 2016 at POPL 2016, St. Petersburg, USA, January 2016*

Conference/Workshop Presentations

[22] TACAS 2021, Virtual, *April 2021*

[23] HIGHLIGHTS of Logic, Games and Automata 2020, Virtual, *September 2020*

[24] AAAI 2020, *New York City, USA, February 2020*

[25] POPL 2020, *New Orleans, USA, January 2020*

[26] CAV 2019, *New York City, USA, July 2019*

[27] SYNT 2019, *New York City, USA, July 2019*

[28] CAV 2018 (a), *Oxford, UK, July 2018*

[29] CAV 2018 (b), *Oxford, UK, July 2018*

[30] FoSSaCS 2018, *Thessaloniki, Greece, April 2018*

[31] Off the Beaten Track 2016, *St. Petersburg, USA, January 2016*

TEACHING EXPERIENCE

Guest Lecturer

Logic in Computer Science (Moshe Y. Vardi, COMP 409/509) Fall 2018, Fall 2019

Teaching Assistant

Statistical Machine Learning (Devika Subramanian, COMP 540, ∼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, ∼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, ∼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 ∼100% from Spring 15 to Spring 16.

SERVICE

Research Community

- **Outreach and Mentorship**
  - Co-Organizer, Verification Mentoring Workshop @ CAV 2021
- **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
- **Reviewer**

  Journal

  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

  Conferences

  2020. CONCUR 2020, ICALP 2020, IJCAI 2020

  2019. ISAAC 2019

  2018. FSTTCS 2018, LPAR 2018

  2017. CP 2017, TACAS 2017

  2016. IJCAI 2016

CS Department @ Rice

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

University/Institute

@ 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)

@ CMI

- General Chair, Fiesta 2012, CMI's annual collegiate festival (2012)
- Founder and Head, Environment Club, CMI (2011-2014)
- Volunteer, CMI Workers Welfare Activities, CMI (2011-2014)