Kishor Jothimurugan

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Research Interests

- Applications of Formal Methods in Reinforcement Learning
- Verification of Neural Networks
- Program Analysis

Education

- **University of Pennsylvania** **Philadelphia, USA**
  PhD candidate in Computer and Information Science, Current GPA 4.0/4.0 *2017–present*
  Advised by Prof. Rajeev Alur
- **Chennai Mathematical Institute** **Chennai, India**
  B.Sc. (Honors) Mathematics and Computer Science, CGPA 9.77/10 *2014–2017*
  Ranked among top 3 students

Relevant Courses

- **Graduate Courses:** Machine Learning (CIS 520), Advanced Machine Learning (CIS 620), Computational Learning Thoery (CIS 625), Software Foundations (CIS 500), Software Analysis and Testing (CIS 700), Elements of Probability Theory (ESE 530).
- **Online:** Deep Learning Specialization by DeepLearning.AI on Coursera.

Publications

* equal contribution, † authors in alphabetical order

Conference Papers

- **Compositional Reinforcement Learning from Logical Specifications**, Kishor Jothimurugan, Suguman Bansal, Osbert Bastani, Rajeev Alur. *Neural Information Processing Systems (NeurIPS), 2021*.
- **Compositional Learning and Verification of Neural Network Controllers**, Radoslav Ivanov*, Kishor Jothimurugan*, Steve Hsu, Shaan Vaidya, Rajeev Alur, Osbert Bastani. *International Conference on Embedded Software (EMSOFT), 2021*.
- **Abstract Value Iteration for Hierarchical Reinforcement Learning**, Kishor Jothimurugan, Osbert Bastani, Rajeev Alur. *Artificial Intelligence and Statistics (AISTATS), 2021*.
- **Space-efficient Query Evaluation over Probabilistic Event Streams**,† Rajeev Alur, Yu Chen, Kishor Jothimurugan, Sanjeev Khanna. *Logic in Computer Science (LICS), 2020*.
- **A Composable Specification Language for Reinforcement Learning Tasks**, Kishor Jothimurugan, Rajeev Alur, Osbert Bastani. *Neural Information Processing Systems (NeurIPS), 2019*.

Workshop Papers

- **Specification-Guided Learning of Nash Equilibria with High Social Welfare**, Kishor Jothimurugan, Suguman Bansal, Osbert Bastani, Rajeev Alur. *Workshop on Safe and Robust Control of Uncertain Systems, NeurIPS 2021*.
- **Compositional Reinforcement Learning from Logical Specifications**, Kishor Jothimurugan, Suguman Bansal, Osbert Bastani, Rajeev Alur. *Workshop on Synthesis (SYNT) 2021, co-located with CAV 2021*.
- **Abstract Value Iteration for Hierarchical Deep Reinforcement Learning**, Kishor Jothimurugan, Osbert Bastani, Rajeev Alur. *Deep RL Workshop, NeurIPS 2020*.

Internships and Summer Schools

- *Research Intern at Nokia Bell Labs, Summer 2020.* An application of deep reinforcement learning to regenerative stopping problems.
- *SDE Intern at Amazon Web Services, Summer 2019.* Using machine learning to improve usability of taint analysis.
- *Marktoberdorf Summer School, Summer 2018.* Summer school on Engineering Secure and Dependable Software Systems.
- *Research Intern at LSV, ENS Cachan, Summer 2017.* Models for distributed reactive synthesis.

Teaching

- *Graduate TA (Spring 2019):* Principles of Embedded Systems (CIS 540).
- *Graduate TA (Fall 2018):* Automata, Computability and Complexity (CIS 262).
- *Undergraduate TA (Spring 2017):* Discrete Mathematics.
- *Online TA:* Design and Analysis of Algorithms (NPTEL MOOC).

Technical skills

- **Programming Languages:** C++ (fluent), Python (fluent), MATLAB (fluent), Java (fluent), Coq.
- **Tools:** LaTeX, Git, Bash, Flow*, StableBaselines.
- **Frameworks:** Tensorflow, Pytorch, Pandas, Soot.

Academic Achievements

- Selected for summer student exchange program between CMI and ENS Paris (Awarded to top 3 students).
- Qualified for ACM ICPC India Regionals 2016 (Chennai and Coimbatore).

Languages

- **Fluent:** English, Hindi
- **Native:** Tamil