

## Research Interests

Learning from demonstrations, Specification inference for hybrid continuous and discrete systems, Interpretability in decision systems, Probabilistic Inference

## Education

- June 2020 **Massachusetts Institute of Technology, Ph.D.**  
(Expected) Aeronautics and Astronautics
- June 2016 **Massachusetts Institute of Technology, S.M.**  
Aeronautics and Astronautics
- August 2013 **Indian Institute of Technology Bombay, B. Tech.**  
Aerospace Engineering

## Publications

### Journal Articles

- [J1] A. Shah, L. Blumberg, and J. Shah, "Planning for manipulation of interlinked deformable linear objects with applications to aircraft assembly," *IEEE Transactions on Automation Science and Engineering*, 2018
- [J2] A. Shah, P. Kamath, S. Li, P. Craven, K. Landers, K. Oden, and J. Shah, "Supervised bayesian specification inference from demonstrations," in *(under review)*, 2019

### Peer-reviewed Conferences

- [C1] J. Kim, C. Muise, A. Shah, S. Agarwal, and J. Shah, "Bayesian inference of linear temporal logic specifications for contrastive explanations," in *International Joint Conference on Artificial Intelligence*, 2019
- [C2] A. Shah, P. Kamath, S. Li, and J. Shah, "Bayesian inference of temporal task specifications from demonstrations," in *Conference on Neural Information Processing Systems*, 2018
- [C3] A. J. Shah and J. A. Shah, "Towards manipulation planning for multiple interlinked deformable linear objects," in *Robotics and Automation (ICRA), 2016 IEEE International Conference on*, IEEE, 2016

### Workshops and Symposia

- [W1] J. Kim, C. Muise, A. Shah, S. Agarwal, and J. Shah, "Bayesian inference of temporal specifications to explain how plans differ," in *ICAPS 2019 Workshop on explainable AI in planning*, 2019
- [W2] A. Shah and J. Shah, "Towards specification learning from demonstrations," in *Robotics: Science and Systems, Workshop on Learning From Demonstrations for High-Level Robotics Tasks*, 2018
- [W3] M. Gombolay and A. Shah, "Appraisal of statistical practices in hri vis-a-vis the t-test for likert items/scales," in *2016 AAAI Fall Symposium Series*, 2016

### Thesis

- [T1] A. Shah, "Planning for manipulation of interlinked deformable linear objects with applications to aircraft assembly," Master's thesis, Massachusetts Institute of Technology, 2016

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## Academic Service

Reviewer IEEE/RSJ International Conference on Intelligent Robots and Systems  
IEEE International Conference on Robotics and Automation  
AAAI Conference on Artificial Intelligence  
ACM/IEEE International Conference on Human Robot Interaction  
Robotics Science and Systems  
IEEE Conference of Decision and Control  
Conference on Neural Information Processing Systems

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## Invited Talks

October 2018 Brown University Robotics  
March 2019 University of Colorado Boulder  
May 2019 University of Washington

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## Award and Honors

IIT-B Institute Silver Medal 2013 for the best academic performance in Aerospace Engineering batch of 2013  
IIT-B Boeing Academic Award (2009)  
IIT-B Institute Academic Award (2009, 2010, 2011)  
Gold Medal at the Indian National Physics Olympiads 2009 (Awarded to top-35 students across the country)

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## Teaching Experience

Fall 2013 **Teaching Assistant**, *16.06 Principles of Automatic Control*.  
Undergraduate control theory class

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## Work Experience

Jan 2014 – **Research Assistant**, *Robotics in Final Assembly tasks*, Interactive Robotics Group, MIT.  
Jan 2017

- Developed a task planning algorithm for installation of interlinked cables.
- Developed a perception algorithm to estimate cable shape using depth images.

Jan 2017 – **Research Assistant**, *Intelligent Mission Analysis and Review Systems*, Interactive Robotics Group, MIT.  
Present

- Developed data-driven models for supervised trajectory segmentation and mission phase annotation.
- Developed a Bayesian inference framework to learn temporal logic specifications from mission demonstrations.

May – Jul 2011 **Summer Intern**, *National Aerospace Laboratories*, Bengaluru, India.  
2011

- Developed software routines to compute aircraft drag polars given airframe geometry

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## Other Projects

May 2010 – **Pratham: IITB Student Satellite Project**, IIT-B.  
May 2013

- Head of attitude determination and control subsystem.
- Designed performance verification simulations for attitude control and power distribution systems.

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## Mentorship

### Undergraduate Researchers

Jan 2016 – **Pravina Samaratunga**.  
Jan 2017

- Estimation of deformable object shape from depth images.

May 2017 – **Lotta Blumberg.**

- Jan 2018
  - Simulation and evaluations of task planning algorithms for deformable object manipulation.
  - Supervised learning for mission trajectory segmentation.

Feb 2018 – **David Amirault.**

- Jun 2018
  - Recovering interpretable data structures from temporal logic formulas.
  - Design of priors over temporal logic formulas as probabilistic programs.

Sep 2018 – **Josh Rosenkranz.**

- March 2019
  - Comparison of Seq-2-Seq learning with Bayesian specification inference for simulated air-combat exercise assessment.