Ankit Shah

550 Memorial Drive, 7D1
Cambridge, MA 02139, USA
(+1) 617-543-0769
ankitshah91@gmail.com
ajshah.info

Research Interests

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

Education

June 2020 (Expected) **Massachusetts Institute of Technology**, *Ph.D.*
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

Preprints

[P1] A. Shah, S. Li, and J. Shah, "Planning with uncertain specifications (puns)," *arXiv e-prints*, p. arXiv:1906.03218, Jun 2019

Workshops and Symposia

[W1] A. Shah and J. Shah, "Planning with uncertain specifications," in *Robotics: Science and Systems, Workshop on Combining Learning and Reasoning – Towards Human-Level Robot Intelligence*, 2019

[W2] 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

[W3] 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

[W4] 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

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

Invited Talks

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

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)

Teaching Experience

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

Work Experience

Jan 2014 – Jan 2017 **Research Assistant**, *Robotics in Final Assembly tasks*, Interactive Robotics Group, MIT.
- Developed a task planning algorithm for installation of interlinked cables.
- Developed a perception algorithm to estimate cable shape using depth images.

Jan 2017 – Present **Research Assistant**, *Intelligent Mission Analysis and Review Systems*, Interactive Robotics Group, MIT.
- 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.
- Developed software routines to compute aircraft drag polars given airframe geometry

Other Projects

May 2010 – May 2013 **Pratham: IITB Student Satellite Project**, IIT-B.
- Head of attitude determination and control subsystem.
- Designed performance verification simulations for attitude control and power distribution systems.

Mentorship

Undergraduate Researchers

Jan 2016 – Jan 2017 **Pravina Samaratunga**.
- Estimation of deformable object shape from depth images.

May 2017 – Jan 2018 **Lotta Blumberg**.
- Simulation and evaluations of task planning algorithms for deformable object manipulation.
- Supervised learning for mission trajectory segmentation.

Feb 2018 – Jun 2018 **David Amirault**.
- Recovering interpretable data structures from temporal logic formulas.
- Design of priors over temporal logic formulas as probabilistic programs.

Sep 2018 – March 2019 **Josh Rosenkranz**.
- Comparison of Seq-2-Seq learning with Bayesian specification inference for simulated air-combat excercise assessment.