

# Somil Bansal

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CONTACT INFORMATION	734 Sutardja Dai Hall University of California, Berkeley	e-mail: somil@berkeley.edu webpage : <a href="http://people.eecs.berkeley.edu/~somil">http://people.eecs.berkeley.edu/~somil</a>
RESEARCH INTERESTS	My research lies at the intersection of Machine Learning, Control Theory, and Robotics. I am particularly interested in <ul style="list-style-type: none"><li>• Combining machine learning and control theory tools to develop data-efficient methods for controlling autonomous systems in unknown environments;</li><li>• Developing tools for the performance analysis, e.g., safety and robustness analysis, of data-driven models.</li></ul>	
EDUCATION	<b>University of California, Berkeley</b> <i>PhD in Electrical Engineering and Computer Sciences</i> Advised by Prof. Claire Tomlin CGPA : 4.0/4.0	2015 - present
	<b>University of California, Berkeley</b> <i>MS in Electrical Engineering</i> Advised by Prof. Claire Tomlin CGPA : 4.0/4.0	2012 - 2014
	<b>Indian Institute of Technology, Kanpur</b> <i>BTech. in Electrical Engineering</i> CGPA : 9.8/10	2008 - 2012
CONFERENCE PUBLICATIONS	<b>Context-Specific Validation of Data-Driven Models</b> <i>Somil Bansal*</i> , Shromona Ghosh*, Alberto Sangiovanni-Vincentelli, Sanjit A. Seshia, Claire J. Tomlin <i>arXiv Preprint, 2018</i>	
	<b>Goal-Driven Dynamics Learning via Bayesian Optimization</b> <i>Somil Bansal</i> , Roberto Calandra, Ted Xiao, Sergey Levine, Claire Tomlin <i>Conference on Decision and Control, 2017</i>	
	<b>MBMF: Model-Based Priors for Model-Free Reinforcement Learning</b> <i>Somil Bansal</i> , Roberto Calandra, Ted Xiao, Sergey Levine, Claire Tomlin <i>arXiv Preprint, 2017</i>	
	<b>Hamilton-Jacobi Reachability: A Brief Overview and Recent Advances</b> <i>Somil Bansal*</i> , Mo Chen*, Sylvia Herbert*, Claire Tomlin <i>Conference on Decision and Control, 2017</i>	
	<b>FaSTrack: a Modular Framework for Fast and Guaranteed Safe Motion Planning</b> Sylvia Herbert, Mo Chen, Soojean Han, <i>Somil Bansal</i> , Jaime F. Fisac, Claire Tomlin <i>Conference on Decision and Control, 2017</i>	
	<b>Safe Sequential Path Planning of Multi-Vehicle Systems Under Disturbances and Imperfect Information</b> <i>Somil Bansal*</i> , Mo Chen*, Jaime F. Fisac, Claire Tomlin <i>American Control Conference, 2017</i>	
	<b>Learning Quadrotor Dynamics Using Neural Network for Flight Control</b> <i>Somil Bansal*</i> , Anayo K. Akametalu*, Frank Jiang, Forrest Laine, Claire Tomlin <i>Conference on Decision and Control, 2016</i>	
	<b>Plug-and-Play Model Predictive Control for Electrical Vehicle Charging and Voltage Control in Smart Grids</b> <i>Somil Bansal</i> , Melanie Zeilinger, Claire Tomlin <i>Conference on Decision and Control, 2014</i>	

JOURNAL  
PUBLICATIONS

**Safe and Resilient Multi-vehicle Trajectory Planning Under Adversarial Intruder**

Somil Bansal\*, Mo Chen\*, Claire Tomlin

*IEEE Transactions on Control Systems Technology (submitted)*

**Provably Safe and Robust Drone Routing via Sequential Path Planning: A Case Study in San Francisco and the Bay Area**

Mo Chen\*, Somil Bansal\*, Ken Tanabe, Claire Tomlin

*AIAA Journal of Guidance, Control, and Dynamics (submitted)*

**Robust Sequential Path Planning Under Disturbances and Adversarial Intruder**

Mo Chen, Somil Bansal, Jaime F. Fisac, Claire Tomlin

*IEEE Transactions on Control Systems Technology, 2017*

**Decomposition of Reachable Sets and Tubes for a Class of Nonlinear Systems**

Mo Chen, Sylvia Herbert, Mahesh Vashishtha, Somil Bansal, Claire Tomlin

*IEEE Transactions on Automatic Control, 2017*

**Plug-and-Play Model Predictive Control for Load Shaping and Voltage Control in Smart Grids**

Caroline L. Floch, Somil Bansal, Claire Tomlin, Scott Moura, Melanie Zeilinger

*IEEE Transactions on Smart Grid, 2017*

TEACHING  
EXPERIENCE

**EE 221A: Linear System Theory**

UC Berkeley, Fall 2016

Graduate Student Instructor

**MTH 101/102: Real and Complex Analysis**

IIT Kanpur, Fall 2009 - Spring 2011

Academic Mentor

EMPLOYMENT

**Applied Predictive Technologies, San Francisco**

Aug 2014 - Sep 2015

*Business Consultant*

Led data-driven analyses to design business initiatives/promotions and to forecast their performance.

**Broadcom, Sunnyvale**

Summer 2013

*Performance Engineering Intern*

Conducted quantitative analyses to identify the performance bottlenecks in existing products.

**University of Western Ontario, London, Canada**

Summer 2011

*Research Intern*

Proposed a novel approach for vector-fitting in the presence of noise for high-frequency applications.

SKILLS

Python, MATLAB, Tensorflow, OpenAI Gym, OpenAI Baselines, L<sup>A</sup>T<sub>E</sub>X, VICON

SELECTED  
AWARDS

- **Graduate Student Gold Fellowship**, Department of EECS, UC Berkeley, 2013.
- **Award for Excellence in Community Service** for tutoring underprivileged students.
- **Academic Excellence Award (Dean's List)** 2010, 2011.