

# Boris Ivanovic

PHD STUDENT IN AERONAUTICS AND ASTRONAUTICS · DEEP LEARNING AND ROBOTICS

Stanford, California, USA

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## Education

### Stanford University

Doctor of Philosophy (PhD) - Aeronautics and Astronautics

Commencing September 2018

Stanford, CA - USA

- Conducting research at the intersection of robotics and deep learning under Prof. Marco Pavone.

### Stanford University

Master of Science (MS) - Computer Science

September 2016 - June 2018

Stanford, CA - USA

- Conducted research in machine learning, computer vision, robotics, and data science.
- Course Assistant for CS231A: Computer Vision From 3D Reconstruction to Recognition.

### University of Toronto

Bachelor of Applied Science (BASC) with High Honours - Engineering Science - GPA: 3.93

September 2012 - June 2016

Toronto, ON - Canada

- Undergraduate thesis with Professors Raquel Urtasun and Sanja Fidler in Visual SLAM and 3D Scene Segmentation.
- Award-winning TA for CSC411: Introduction to Machine Learning.
- Won the final AER201: Engineering Design competition.
- Ranked in the top 10% of Engineering Science students (June 2014).

## Publications

### International Peer-Reviewed Conference Proceedings

BaRC: Backward Reachability Curriculum for Robotic Reinforcement Learning

**B. Ivanovic**, J. Harrison, A. Sharma, M. Chen, M. Pavone

(In Submission) Conference on Robotic Learning (CoRL), 2018, Zurich, Switzerland

Generative Modeling of Multimodal Multi-Human Behavior

**B. Ivanovic**, E. Schmerling, K. Leung, M. Pavone

(In Submission) IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2018, Madrid, Spain

ADAPT: Zero-Shot Adaptive Policy Transfer for Stochastic Dynamical Systems

J. Harrison, A. Garg, **B. Ivanovic**, Y. Zhu, S. Savarese, L. Fei-Fei, M. Pavone

International Symposium on Robotics Research (ISRR), 2017, Puerto Varas, Chile

### Blog Posts

How to Deploy Deep Learning Models with AWS Lambda and TensorFlow

**B. Ivanovic**, Z. Ivanovic

Amazon Web Services (AWS) AI Blog, 2017

## Experience

### Amazon.com

Prime Air SDE Intern

June 2017 - September 2017

Seattle, WA - USA

- Worked with Principal Research Scientist Ishay Kamon in the Autonomy team.
- Designed and implemented a novel state-of-the-art deep learning approach for a specific computer vision task within the team, outperforming existing models by 10x.
- The project was completed successfully and a full-time Research Scientist return offer was extended.

### Stanford University

Independent Research Project

January 2017 - June 2017

Stanford, CA - USA

- Worked in the Computer Vision and Geometry Lab (CVGL) and Autonomous Systems Lab (ASL) with Professors Silvio Savarese and Marco Pavone on making reinforcement learning more robust with control theory.
- Tackled the problem of policy transfer in reinforcement learning, applying model-predictive control to provide safety guarantees when transferring a learned policy from one environment to another with different dynamics.
- Our work was accepted to the International Symposium on Robotics Research (ISRR) 2017, held in Puerto Varas, Chile.

## Stanford University

September 2016 - June 2017

### Research Assistant

Stanford, CA - USA

- Worked in the Stanford Network Analysis Project (SNAP) Lab with Professor Jure Leskovec on analyzing large-scale physical activity data with modern data science methods.
- Efficiently cleaned, preprocessed, and distilled 3 TB of user physical activity data from over 2 million users of a mobile fitness app. Obtained scientific results with data visualization, statistical analyses (such as regressions and confidence metrics), and computational methods (including hierarchical bootstrapping).
- Showed significant results relating a location's walkability, weather, and climate to an individual's physical activity. This work has very wide implications, as physical inactivity is a major global pandemic responsible for over 5 million deaths per year.

## Amazon.com

May 2016 - August 2016

### Prime Air SDE Intern

Seattle, WA - USA

- Worked with former NASA Astronaut Neil Woodward in the Flight Test team.
- Designed and built fault-tolerant, scalable software and hardware to autonomously collect and process relevant flight test data from numerous locations for internal consumption.
- The project was completed successfully and a return offer was extended.

## ETH Zurich

May 2015 - August 2015

### Summer Research Intern

Zurich - Switzerland

- Worked with Professor Raffaello D'Andrea in the Institute for Dynamic Systems and Control, specifically the Flying Machine Arena.
- Removed superfluous code from an open source motor controller and implemented new features such as motor calibration, emergency safety states, and a better motor startup routine in C.
- Simulated dynamic motor and propeller system responses in Python.
- Technology used: STM32 C Code, Motor Controller PCB Chips, Quadrotor Flying Vehicles.

## Amazon.com

May 2014 - July 2014

### SDE Intern

Seattle, WA - USA

- Worked in the Demand Forecasting team creating a real-time simulation tool. The project was completed successfully and a return offer was extended.
- Worked with Big Data, using the Hadoop framework (MapReduce, HDFS, etc.) to process large amounts of simulation data generated by a machine learning module.
- Created a web service with Spring, designed and implemented a website UI with GWT, and used the AWS SDK to store and retrieve data from S3.
- Gave a presentation to 100+ Amazon employees regarding my project and its design, implementation, and performance.
- Concepts employed: Big Data, Highly Scalable Distributed Systems, and Data Mining.

## Awards

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### University of Toronto

May 2016

#### Engineering Science Award of Excellence

Toronto, ON - Canada

Received for maintaining a CGPA greater than 3.90.

### University of Toronto

May 2016

#### Computer Science TA Award

Toronto, ON - Canada

Received for being the best Computer Science TA in the Winter 2016 semester.

### National Sciences and Engineering Research Council (NSERC)

April 2016

#### NSERC Master's Postgraduate Scholarship (CGS-M) (Declined)

Canada

The CGS-M Program provides financial support to high-calibre scholars who are engaged in eligible master's programs in Canada.

### University of Toronto

September 2012 - June 2016

#### Dean's Honour List

Toronto, ON - Canada

Placed on the Dean's Honour List for all undergraduate semesters.

### University of Toronto

September 2012

#### University of Toronto Scholarship

Toronto, ON - Canada

Received for being one of the top 300 entrants to the University of Toronto in 2012.

## Skills

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<b>Programming</b>	Python, Java, C/C++, MATLAB, R, Scala, Verilog, Assembly, Web (HTML5/CSS3/JavaScript)
<b>Robot Learning</b>	TensorFlow, MXNet, Theano, MuJoCo, Box2D, MazeBase, ROS
<b>Data Science</b>	NumPy, Pandas, Seaborn, Matplotlib, StatsModels
<b>Libraries/SDKs</b>	Amazon Web Services SDK, Hadoop, Spark, Node.js, Google Web Tools, Android SDK