

# LUCAS MANUELLI

## CONTACT INFORMATION

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## RESEARCH INTERESTS

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I work in robotics at the intersection of perception, control and machine learning. Specifically I am passionate about making robots that can accomplish meaningful tasks *in the wild*. I believe that achieving this will require a tight coupling of both perception and control. My research has focused on exploring this connection between perception and control, as it applies to robotic manipulation, using tools from both classical robotics and machine learning.

## EDUCATION

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### Massachusetts Institute of Technology

*September 2015 - Present*

*PhD Candidate, Robot Locomotion Group*

Advised by Prof. Russ Tedrake

Department of Electrical Engineering and Computer Science (EECS)

GPA: 5.0/5.0

### Massachusetts Institute of Technology

*January 2017*

*Masters of Science (SM)*

Advised by Prof. Russ Tedrake

Department of Electrical Engineering and Computer Science (EECS)

GPA: 5.0/5.0

### Massachusetts Institute of Technology

*May 2015*

*Masters of Science (SM)*

Department of Economics

GPA: 4.9/5.0

### Princeton University

*June 2012*

*Bachelor of Arts, Summa Cum Laude*

Department of Mathematics

GPA: 3.97/4.0

## HONORS AND AWARDS

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Conference on Robot Learning (CoRL) Best Paper Award October 2018

Amazon Robotics Best Paper Awards in Manipulation: Best Technical Paper 2018

School of Engineering Lemelson Presidential Fellowship, MIT 2015-2016

Presidential Fellow, MIT 2012-2013

National Science Foundation Graduate Research Fellowship 2012-2015

Graduated with *High Honors*, Department of Mathematics, Princeton University June 2012

Graduated *Summa Cum Laude*, Princeton University June 2012

<b>Phi Beta Kappa (early selection)</b> , Princeton University	February 2012
<b>Shapiro Prize for Academic Excellence</b> , Princeton University	2009-2010
<b>Manfred Pyka Memorial Prize in Physics</b> , Princeton University	2009
<b>Shapiro Prize for Academic Excellence</b> , Princeton University	2008-2009
<b>National Merit Scholarship</b>	2008

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## PEER REVIEWED PUBLICATIONS

\* denotes equal contribution

- [1] **Self-Supervised Correspondence in Visuomotor Policy Learning**  
*IEEE Robotics and Automation Letters*, April 2020.  
Peter Florence, **Lucas Manuelli** and Russ Tedrake.  
*Under Review for ICRA 2020.*
- [2] **kPAM: Keypoint Affordances for Robotic Manipulation**  
*International Symposium on Robotics Research, 2019*  
**Lucas Manuelli\***, Wei Gao\*, Peter Florence and Russ Tedrake.  
*Also in CVPR 2019 Workshop on 3D Scene Understanding*
- [3] **DenseObjectNets: Learning Dense Visual Object Descriptors by and for Robotic Manipulation**  
*Conference on Robot Learning, 2018*  
Peter Florence\*, **Lucas Manuelli\*** and Russ Tedrake  
*Winner of CoRL 2018 Best Paper Award*  
*Winner, Best Technical Paper, Amazon Robotics Best Paper Awards in Manipulation 2018*
- [4] **LabelFusion: A Pipeline for Generating Ground Truth Labels for Real RGBD Data of Cluttered Scenes**  
*In International Conference on Robotics and Automation (ICRA) 2018*  
Pat Marion\*, Peter Florence\*, **Lucas Manuelli\*** and Russ Tedrake  
*ICRA Best Vision Paper Finalist*
- [5] **Localizing external contact using proprioceptive sensors: The contact particle filter**  
*International Conference on Intelligent Robots and Systems (IROS) 2016*  
**Lucas Manuelli** and Russ Tedrake

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## ADDITIONAL ROBOTICS EXPERIENCE

<b>MIT DARPA Robotics Challenge Team</b>	Jan 2015 - June 2015
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Member of MIT's Darpa Robotics Challenge (DRC) team working on planning and controls for the Atlas robot. Specifically I worked on the motion planning and controls used for the driving and egress portions of the challenge. Subsequent to the DRC finals I also worked on the walking control system.

<b>NASA Valkyrie Walking Controller</b>	2017
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Implemented a walking controller for the NASA Valkyrie robot using the LIPM (linear inverted pendulum model) formulation together with a QP (quadratic program) for realtime control. This controller was adapted from the walking controller used for the Atlas robot during the Darpa Robotics Challenge.

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## INDUSTRY EXPERIENCE

**Amazon Robotics**

Jun-Aug 2017

Interned at Amazon Robotics where I developed and implemented advanced grasping algorithms on robot arms.