Alejandro Perez   atp@csail.mit.edu

Massachusetts Institute of Technology   G416 32 Vassar Street
Ph.D. Candidate, Computer Science   Cambridge, MA 02139-4307

AWARDS
- National Defense Science and Engineering Graduate Fellowship, 2013
- National Science Foundation Graduate Research Fellowship, 2012
- Lemelson Engineering Presidential Fellowship, 2012
- Great Educators Fellowship, 2012
- Outstanding Accomplishments and Contributions as a Teaching Assistant,
  Cornell University, Department of Computer Science, 2012
- MIT Global Challenge 2011, IDEAS Competition, Top Juried Prize, Assistive Technology Group
- White House Fellowship, Nominated, 2010
- Google Scholarship, 2010
- National Science Foundation S-Stem Scholarship, 2009, 2010
- Outstanding Participant Award: Best Overall Demonstrated Excellence in Leadership
  and Technical Achievements, Robotics Academy, NASA Goddard Space Flight Center, 2009

RESEARCH EXPERIENCE

MIT Computer Science and Artificial Intelligence Laboratory,   Cambridge, MA
Ph.D. Candidate   Present

Working with Prof. Tomas Lozano-Perez and Prof. Leslie Kaelbling.

Mujin Inc.,   Tokyo, Japan
Lead Planning Consultant   January, 2014 - June, 2014

Worked on the development of a general-purpose bin-picking system capable of real-time motion planning for the grasping and placing of arbitrary manufacturing parts loaded in disorganized bins.

MIT Computer Science and Artificial Intelligence Laboratory,   Cambridge, MA
Visiting Student   May, 2011 - August, 2011

Worked with Prof. Tomas Lozano-Perez and Prof. Leslie Kaelbling on optimal sampling-based planning for belief-spaces and underactuated systems.

MIT Computer Science and Artificial Intelligence Laboratory,   Cambridge, MA
Visiting Student   January, 2011 - May, 2011

Worked with Prof. Seth Teller and Prof. Emilio Frazzoli on the development of a motion planning algorithm that accounts for uncertainty. Developed a high-dimensional optimal motion planning algorithm for the PR2 robot.

MIT Computer Science and Artificial Intelligence Laboratory,   Cambridge, MA
Undergraduate Researcher, MSRP   June, 2010 - December, 2010

Worked with Prof. Seth Teller and Prof. Emilio Frazzoli on the Agile Robotics for Logistics project. Developed a real-time optimal motion planning algorithm for an autonomous forklift used for mobile manipulation tasks.

NASA Goddard Space Flight Center,   Greenbelt, MD
Undergraduate Researcher   August, 2009 - February, 2010

Implemented an algorithm that successfully classified and detected Martian volcanic rocks after being trained with samples from images taken by the Spirit Martian Rover.

NASA Goddard Space Flight Center,   Greenbelt, MD
Undergraduate Researcher, NASA Robotics Academy   June, 2009 - August, 2009

Developed real-time path planning and coverage algorithms for future lunar robotic missions. Carried out simulated missions at the Multipurpose Exo-terrain for Robotic Studies (MERS) field.

ACADEMIC SERVICE	**Reviewer**

Robotics and Autonomous Systems
Journal of Intelligent and Robotic Systems
IEEE Transactions on Robotics
IEEE Transactions on Aerospace and Electronic Systems
Annual Reviews in Control
IEEE International Conference on Robotics and Automation
IEEE/RSJ International Conference on Intelligent Robots and Systems

TEACHING

Teaching Assistant, Robot Learning
Cornell University, Department of Computer Science, NY   2012

Lectured on the Robot Operating System (ROS). Held weekly office hour sessions at the Robotics Lab. PR2 robot administrator.

REFEREED CONFERENCE PUBLICATIONS

Gustavo Goretkin, Alejandro Perez, Robert Platt Jr., George Konidaris. *Optimal Sampling-Based Planning for Linear-Quadratic Kinodynamic Systems.* Proceedings of the IEEE International Conference on Robotics and Automation. Karlsruhe, Germany, 2013.

Alejandro Perez, Robert Platt Jr., George Konidaris, Leslie Kaelbling, Tomas Lozano-Perez. *LQR-RRT*: Automatically Deriving Extension Heuristics for Sampling-Based Optimal Motion Planning.* Proceedings of the IEEE International Conference on Robotics and Automation. St. Paul, MN, 2012.

Alejandro Perez, Sertac Karaman, Matthew R. Walter, Alexander Shkolnik, Emilio Frazzoli, Seth Teller. *Asymptotically-optimal Manipulation Planning using Incremental Sampling-based Algorithms.* Proceedings of the IEEE/RSJ International Conference on Intelligent Robots, San Francisco, California, September, 2011.

Sertac Karaman, Matthew R. Walter, Alejandro Perez, Emilio Frazzoli, Seth Teller. *Anytime Motion Planning using the RRT*.* Proceedings of the IEEE International Conference on Robotics and Automation, Shanghai, China, May 2011.

REFEREED WORKSHOP PUBLICATION

Alejandro Perez, Sertac Karaman, Matthew R. Walter, Emilio Frazzoli, Seth Teller. *Asymptotically-optimal Manipulation Planning using Incremental Sampling-based Algorithms.* Proceedings of the IEEE/RSJ International Conference on Intelligent Robots, The PR2 Workshop, San Francisco, California, September, 2011.

REPORTS

Alejandro Perez. *On Randomized Path Coverage of Configuration Spaces.* CSAIL Tech Report MIT-CSAIL-TR-2013-027. http://dspace.mit.edu/handle/1721.1/82462. Computer Science and Artificial Intelligence Laboratory, Massachusetts Institute of Technology, 2013.

Matthew Jordan, Alejandro Perez. *Optimal Bidirectional Rapidly-Exploring Random Trees.* CSAIL Tech Report MIT-CSAIL-TR-2013-021. http://dspace.mit.edu/handle/1721.1/79884. Computer Science and Artificial Intelligence Laboratory, Massachusetts Institute of Technology, 2013.

Alejandro Perez, Sertac Karaman. *Computationally-Efficient Asymptotically-Optimal Manipulation Planning using the RRT*.* Unpublished report, MIT Computer Science and Artificial Intelligence Laboratory, 2011.

Alejandro Perez, Seth Teller. *Optimal Motion Planning for Agile Autonomous Vehicles using RRT*.* Unpublished report, MIT Computer Science and Artificial Intelligence Laboratory, 2010.

Alejandro Perez. *Object Recognition and Learning for Planetary Rovers.* Unpublished report, NASA Goddard Space Flight Center, 2009.

PRESENTATIONS & TALKS	Alejandro Perez. *LQR-RRT*: Automatically Deriving Extension Heuristics for Sampling-Based Optimal Motion Planning.* Conference talk, IEEE International Conference on Robotics and Automation (ICRA), St. Paul, MN. May, 2012.

Alejandro Perez. *The ROS (Robot Operating System) Demo Lecture.* CS 4758/6758: Robot Learning course, Cornell University, Department of Computer Science, Ithaca NY. February, 2012.

Alejandro Perez. *Asymptotically-optimal Manipulation Planning using Incremental Sampling-based Algorithms.* Conference talk, IEEE/RSJ International Conference on Intelligent Robots (IROS), San Francisco CA. September, 2011.

Alejandro Perez. *Optimal Planning in Challenging Domains.* Talk given at the MIT Computer Science and Artificial Intelligence Laboratory, Learning and Intelligent Systems Group Statistical AI Reading Meeting. Cambridge MA. April, 2011.

Alejandro Perez. *Asymptotically-optimal Manipulation Planning using Incremental Sampling-based Algorithms.* Invited talk, Jaybridge Robotics. Cambridge MA. April, 2011.

Alejandro Perez. *Optimal Motion Planning for Agile Autonomous Vehicles using RRT*.* Talk given at MIT. Cambridge MA. August, 2010.

Alejandro Perez, et al. (NASA Student Ambassadors). *Open Dialogue with a Nobel Laureate.* Group discussion. Stockholm, Sweden. May, 2010.

MEDIA COVERAGE	MIT News, Smarter Robot Arms

ABC News - This Could be Big, A Smarter & Smoother Robot Arm
Slashdot, Smarter Robot Arms
New Scientist, Smart arms for a robot give it smooth moves
Communications of the ACM, Smarter Robot Arms
New England Post, MIT Researchers Develop Robot Arm Capable of Human-like Movement; Underlying Algorithm Could Have Far-Reaching Applications
Gizmodo, An algorithm that makes robots appear more human
New Atlas, Better planning makes robot movements more efficient and predictable
Azorobotics, Researchers from MIT Work on Building Robotic Motion-Planning System
Indian Express, Soon, smart robot arms to make them move more smoothly

HOMEPAGE	http://people.csail.mit.edu/aperez/

PUBLICATIONS	Google Scholar Page