

# IVAN DARIO JIMENEZ RODRIGUEZ

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## EDUCATION

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**California Institute of Technology, Pasadena, CA**  
*PhD in Computing and Mathematical Sciences (3.50/4.00 GPA)*  
**Georgia Institute of Technology, Atlanta, GA**  
*M.S. Computer Science (3.92/4.00 GPA)*  
*B.S. Computer Science (3.64/4.00 GPA)*

*Graduate May 2025*  
*Graduate May 2019*  
*Graduate December 2016*

## RESEARCH INTERESTS

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Theory and applications at the intersection of Machine Learning and Control with focus on Computer Vision and Robotics.

## TECHNICAL STRENGTHS

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<b>Computer Languages:</b>	Python, C++, C, MATLAB	<b>Operating Systems:</b>	Linux, ROS, Windows
<b>Typesetting Systems:</b>	L <sup>A</sup> T <sub>E</sub> X	<b>Build Systems:</b>	CMake, Make, SCons
<b>Containerization Systems:</b>	Docker	<b>Version Control:</b>	Git, SVN

## EXPERIENCE

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**Carnegie Mellon University** May - August 2018  
*Research Assistant - Advised By Zico Kolter* *Pittsburgh, PA*

- Implemented various car simulation environments that are parallelized on the GPU for fast data collection using Pytorch.
- Implemented a differentiable iterative linear quadratic regulator (iLQR) to solve nonlinear optimal control tasks using PyTorch. Being differentiable enables inverse optimal control (learning the cost function for a task) and system identification (learning the parameters for the dynamics of the system).

**IRobot** May - August 2016 and January - August 2017  
*Research Internship* *Bedford, MA*

- Implemented a templated C++ sparse least-squares solver that avoids dynamic memory allocation.
- Implemented a fixed-lag smoother to efficiently solve SLAM with odometry and visual features that was 3 times faster on embedded platforms than the current state of the art GTSAM implementation.
- Worked on developing vision-based simultaneous localization and mapping (VSLAM) capabilities for an autonomous outdoor robot platform.
- Improved VSLAM performance by reducing fiducial detection error by 50% by using an ellipse fitting method.
- Implemented joystick controller in C++ for manual driving of outdoor robot platform.

## PUBLICATIONS

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- Ivan D. Jimenez Rodriguez, Aaron D. Ames, Yisong Yue. A Lyapunov Method for Learning with Dynamical Systems (In Preparation)
- Ivan D. Jimenez Rodriguez, Ugo Rosolia, Aaron D. Ames, Yisong Yue. Learning to Control an Unstable System with One Minute of Data: Leveraging Gaussian Process Differentiation in Predictive Control (IROS 2021) (45 % Acceptance Rate)
- Silva, A., Killian, T., Jimenez, I., Son, S. H. Gombolay, M. Optimization methods for interpretable differentiable decision trees applied to reinforcement learning. (AISTATS 2020)
- B. Amos, I. D. Jimenez, J. Sacks, B. Boots, Z. Kolter. Differentiable MPC for End-to-end Planning and Control. (NIPS 2018)(21% Acceptance Rate)
- I. D. Jimenez. A Factor Graph Approach To Constrained Optimization. (2016). (Thesis)

## TEACHING EXPERIENCE - CS 6476 COMPUTER VISION

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<b>CS6476 Computer Vision</b>	Professor: Irfan Essa	Head TA Fall 2018 and Spring 2019
<b>ACM 104 Applied Linear Algebra</b>	Professor: Kostia Zuev	Fall 2020