Ramón Darío Iglesias

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Recent Experience

Lyft Inc., San Francisco, CA **09/2019-Present**

Data Scientist

Tech lead building algorithmic systems for managing driver supply in real-time:

- Increased Lyft revenue by 5% in selected markets by designing, building and managing the Priority Mode Controller, a real-time admission system that controls access to Priority Mode. Offline, the controller learns the relationship between the percentage of Priority drivers and the percentage of rides assigned to Priority rides; online, it uses this model to optimize the size of the Priority set that maximizes market surplus.
- Influenced team roadmap by studying the effectiveness of different monetized and unmonetized driver nudges via A/B testing leading to a complete revamp of the real-time supply management strategy.
- Built a driver positioning recommendation system that optimizes driver earnings based on short-term, geotemporal forecasts of supply and demand.
- Enhanced Lyft's internal market simulator to support for centralized fleet control.

Stanford University, Stanford, CA **01/2016-08/2019**

Research Assistant

Devised methods to model and control large fleets of autonomous vehicles (Autonomous Mobility-on-Demand, or AMoD):

- Developed a queueing-theoretical framework to characterize AMoD systems under heterogeneous constraints (e.g. road congestion, battery charging) that is amenable to optimization by casting it as a linear program [6, 4].
- Leveraged network flow theory to optimize the interaction between autonomous, electric fleets and the power grid [3, 2].
- Developed a stochastic model predictive controller that leverages demand forecasts from a recurrent neural network to operate in real-time large fleets of autonomous vehicles [5, 1] resulting in a 90% reduction in passenger waiting when compared to other methods in the literature.
- Built a vehicle relocation system in collaboration with Toyota Ha:mo, a carsharing system in Japan. Scope included the algorithmic relocation system as well as the UI used by the human relocators. Deployed pilot results showed 5% increased availability of the vehicles and 10% increase in parking.

Side projects in representation learning:

- Studied the impact of multi-task learning on the learned representations of convolutional neural networks. Results show increased predictive power with respect to representations observed in the Inferior Temporal (IT) cortex of primates.
- Developed deep learning methods to learn Bayesian filters from only images with the goal of recovering controllable latent dynamics.

Lyft Inc., San Francisco, CA **06/2018-09/2018**

Research Science Intern

Worked on improving the performance of Lyft's self-driving pilot:

- Developed an algorithm that leverages demand forecasts and stochastic programming to optimize self-driving fleet movements in real-time. Simulation results show significant improvements in pickup time when compared to human drivers.
- Performed steady-state analyses to characterize upper bound (using network flows) and expected improvements (using queueing theory) based on historical data. This along with power analyses allowed us to design experiments in production.
- Deployed the prepositioning algorithm to a self-driving pilot in Las Vegas as part of an A/B test to understand the impact of prepositioning in ridesharing fleets.

SunPower, Richmond, CA **01/2015-01/2016**

Software Engineer

Architected and developed software for the Financial Products team:

- Built a new pricing engine powering over $5M yearly in new residential leases.
- Developed an internal data processing web application to run and visualize complex financial analyses.
- Built the continuous integration pipeline for the Financial Products team allowing for faster and safer developing iterations.

Stanford University, Stanford, CA **10/2013-12/2014**

Research Assistant

Developed methods to optimize wind farm contractors operational costs:

- Built Markov chain models to forecast the expected number of days lost due to high winds by month and the best hours of the day to work each month using historical wind speed measurements and numerical weather prediction models.
- Developed a data processing and optimization pipeline for converting GIS files of wind farms into optimal erection schedules. It consists of parsing the input files into a weighted graph and solving the crane schedule as a Traveling Salesman Problem.
- Built a web application (Angular frontend, Python backend) for wind farm contractors to leverage the wind forecasting and crane scheduling models to make better decisions on the design and construction schedule of the wind farm.

Education

Stanford University **01/2016-08/2019**
Ph.D. in Civil Engineering
Advisor: Marco Pavone
Focus: Optimal Control of Autonomous Fleets.

Stanford University **09/2012-06/2014**
M.S. in Civil Engineering
Focus: Data Analysis and Optimization.

The University of Texas at Austin **08/2007-06/2012**
B.S. in Civil Engineering

Skills

Software: Python (Numpy, Pandas, Tensorflow, PyTorch, Flask), Javascript (React, AngularJS, D3, Leaflet), R; AWS, Spark, Git, Docker, CircleCI, PostgreSQL, LaTeX

Coursework: Machine Learning, Data Mining, Decision Making under Uncertainty, Optimization, Deep Learning, Data Visualization, Optimal Control, State Estimation, Web Development

Publications

[1] M. Tsao, R. Iglesias, and M. Pavone. Stochastic model predictive control for Autonomous Mobility on Demand. In *Proc. IEEE Int. Conf. on Intelligent Transportation Systems*, 2018. In Press.

[2] F. Rossi, R. Iglesias, M. Alizadeh, and M. Pavone. On the interaction between Autonomous Mobility-on-Demand systems and the power network: Models and coordination algorithms. *IEEE Transactions on Control of Network Systems*, 2018. Submitted.

[3] F. Rossi, R. Iglesias, M. Alizadeh, and M. Pavone. On the interaction between Autonomous Mobility-on-Demand systems and the power network: Models and coordination algorithms. In *Robotics: Science and Systems*, 2018.

[4] R. Iglesias, F. Rossi, R. Zhang, and M. Pavone. A BCMP network approach to modeling and controlling autonomous mobility-on-demand systems. *Int. Journal of Robotics Research*, 2018.

[5] R. Iglesias, F. Rossi, K. Wang, D. Hallac, J. Leskovec, and M. Pavone. Data-driven model predictive control of Autonomous Mobility-on-Demand Systems. In *Proc. IEEE Conf. on Robotics and Automation*, 2018.

[6] R. Iglesias, F. Rossi, R. Zhang, and M. Pavone. A BCMP network approach to modeling and controlling Autonomous Mobility-on-Demand systems. In *Workshop on Algorithmic Foundations of Robotics*, 2016.