

Daniel E. Ochoa

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Education

Ph.D., Electrical Engineering

September 2019-Present

UNIVERSITY OF COLORADO BOULDER

- **Relevant coursework:**

- Applied Analysis
- Hybrid Dynamical Systems: Theory and Applications
- Geometric Control

M.Sc., Electrical and Computer Engineering

October 2019

UNIVERSIDAD DE LOS ANDES, COLOMBIA

- **Thesis:** “Deep reinforcement learning and population dynamics for water systems control”

- **Relevant coursework:**

- Nonlinear systems
- Stochastic processes

B.Sc. *cum laude*, Electrical Engineering

October 2017

UNIVERSIDAD DE LOS ANDES, COLOMBIA

- **Minor:** Computational Mathematics

- **Thesis:** “On the implementation of control strategies for a physical drainage model ”

- **Relevant coursework:**

- Machine Learning
- Design and analysis of algorithms

B.Sc., Physics

October 2017

UNIVERSIDAD DE LOS ANDES, COLOMBIA

- **Thesis:** “A versatile setup for the observation of different quantum phenomena ”

- **Relevant courses:**

- Special topics on quantum mechanics
- Modern optics

Publications

- **Ochoa, D. E.**, Poveda, J. I., Uribe, C. A., & Quijano, N. (2020). *Robust optimization over networks using distributed restarting of accelerated dynamics*. IEEE Control Systems Letters, 5(1), (pp. 301-306).
- Martinez-Piauelo, J., **Ochoa, D. E.**, Quijano, N., & Giraldo, L. F. (2020). *A Multi-Critic Reinforcement Learning Method: An Application to Multi-Tank Water Systems*. IEEE Access, 8, (pp. 173227-173238).
- **Ochoa, D. E.**, Poveda, J. I., Uribe, C. A., & Quijano, N. (2019). *Hybrid robust optimal resource allocation with momentum*. In 2019 IEEE 58th Conference on Decision and Control (CDC) (pp. 3954-3959).
- **Ochoa, D.E.**, Riano-Briceno, G., Quijano, N., & Ocampo-Martinez, C. (2019). *Control of Urban Drainage Systems: Optimal Flow Control and Deep Learning in Action*. In 2019 American Control Conference (ACC) (pp. 4826-4831).

Honors & Awards

2019-2020	Dean's Graduate Assistantship for the Autonomous Systems Interdisciplinary Research Theme, University of Colorado Boulder
2020	Student Travel Support Award, Conference on Decision and Control (CDC) 2020
2019	Student Travel Support Award, American Control Conference (ACC) 2019
2017	Cum laude degree, B.E., Electrical Engineering. Universidad de los Andes, Colombia

Research Experience

Graduate Research Assistant

September, 2019 - Present

UNIVERSITY OF COLORADO BOULDER

- Designed high-performance optimization algorithms from a control theoretic perspective
- Designed hybrid-dynamics for optimization on manifolds

Graduate Research Assistant

August, 2017 - June 2019

UNIVERSIDAD DE LOS ANDES, COLOMBIA

- Integrated reinforcement learning techniques and passivity-based controllers for water-distribution systems control
- Modeled water-distribution systems from a port-hamiltonian systems perspective
- Designed and implemented non-linear passivity-based controllers for water-distribution systems

Undergraduate Research Assistant

February, 2013 - December, 2014

UNIVERSIDAD DE LOS ANDES, COLOMBIA

- Described and deployed a fully functional Reduced Instruction Set Computer Architecture in Verilog for a Spartan-II FPGA
- Programmed an assembly compiler making extensive use of the LEX and YACC libraries available for the C programming language

Teaching Experience

Teaching Assistant - Discrete Mathematics

September, 2020 - Present

UNIVERSITY OF COLORADO BOULDER

- Provided support and guidance for the programming of Python routines oriented to solving Boolean satisfiability problems.
- Presented a Python tutorial for the explanation of the basic control and data structures the language provides.

Teaching Assistant - Reinforcement Learning and Adaptive Control

September, 2019 - December, 2019

UNIVERSITY OF COLORADO BOULDER

- Designed computational problems for the application of theoretical concepts treated in class.
- Presented a Python tutorial that also focused on the exposition of basic reinforcement learning and neural networks concepts.

Laboratory Instructor - Control Theory Laboratory

August, 2017 - June 2019

UNIVERSIDAD DE LOS ANDES, COLOMBIA

- Designed laboratory assessments to reinforce the concepts studied in the master class
- Co-developed a low-cost aero-pendulum project assignment for the evaluation of classical control techniques
- Supervised and graded laboratory practices

Teaching Assistant - Analysis of control systems

February, 2017 - June, 2017

UNIVERSIDAD DE LOS ANDES, COLOMBIA

Programming Tutor

February, 2016 - June, 2016

UNIVERSIDAD DE LOS ANDES, COLOMBIA

Teaching Assistant - Fundamentals of Electronics

February, 2014 - June, 2014

UNIVERSIDAD DE LOS ANDES, COLOMBIA

Extracurricular Activity

Robocol (Student Robotics Team)

August, 2014 - December, 2015

CORE MEMBER

Bogotá, Colombia

- Designed and implemented the central operating system logic for a Rover using the Linux Programming Interface
- Devised the electronic system for a disaster exploration robot