

# Gilberto Díaz-García

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## Research Interest

Design & Analysis of Large-Scale Systems, Distributed Control, Game Theory and its Control Engineering Applications.

## Education

### University of California, Santa Barbara

PH.D. IN ELECTRICAL & COMPUTER ENGINEERING (Ongoing)

Santa Barbara, California, USA

2021–

### University of Los Andes

M.Sc. IN ELECTRONIC AND COMPUTER ENGINEERING (Cum Laude, GPA: 4.86/5.0)

Thesis: “Resilient Synchronization of Multi-agent Systems: A Game Theoretical Approach”.

Advisor: Luis Felipe Giraldo.

Bogotá, Colombia

2018–2020

### University of Los Andes

B.Sc. IN ELECTRONIC ENGINEERING (GPA: 4.4/5.0)

Bogotá, Colombia

2014–2018

### University of Los Andes

MINOR IN COMPUTATIONAL MATHEMATICS

A structured interdisciplinary option with undergraduate courses in Computers and Systems Engineering and Mathematics.

Bogotá, Colombia

2014–2018

## Journal Articles

- **G. Díaz-García**, F. Bullo, and J. R. Marden, “Strategic Coalitions in Networked Contest Games,” *ArXiv preprint arXiv:2408.00883 (Submitted)*, 2024
- Y. John, **G. Díaz-García**, X. Duan, J. R. Marden, and F. Bullo, “A Stochastic Surveillance Stackelberg Game: Co-Optimizing Defense Placement and Patrol Strategy,” *ArXiv preprint arXiv:2308.14714 (Submitted)*, 2024
- **G. Díaz-García**, F. Bullo, and J. R. Marden, “Distributed Markov Chain-Based Strategies for Multi-Agent Robotic Surveillance,” *IEEE Control Systems Letters*, vol. 7, pp. 2527–2532, 2023
- J. Martinez-Piazuelo, **G. Díaz-García**, N. Quijano, and L. F. Giraldo, “Discrete-time Distributed Population Dynamics for Optimization and Control,” 11, vol. 52, IEEE, 2022, pp. 7112–7122
- **G. Díaz-García**, G. Narváez, L. F. Giraldo, J. Giraldo, and A. A. Cardenas, “Resilient structural sparsity in the design of consensus networks,” *IEEE Transactions on Cybernetics*, 2021
- **G. Díaz-García**, D. Guatibonza, and L. F. Giraldo, “Distributed reconfiguration for resilient synchronization of multi-agent systems,” *IEEE Access*, vol. 9, pp. 140 235–140 247, 2021
- A. F. Zambrano, **G. Díaz-García**, S. Ramírez, L. F. Giraldo, H. Gonzalez-Villasanti, M. T. Perdomo, I. D. Hernández, and J. M. Godoy, “Donation networks in underprivileged communities,” *IEEE Transactions on Computational Social Systems*, pp. 1–10, 2020

## Conference Publications

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- Y. John, C. Hughes, **G. Díaz-García**, J. R. Marden, and F. Bullo, “RoSSO: A High-Performance Python Package for Robotic Surveillance Strategy Optimization Using JAX,” in *2024 IEEE International Conference on Robotics and Automation (ICRA)*, IEEE, 2024, pp. 2169–2175
- **G. Díaz-García**, F. Bullo, and J. R. Marden, “Beyond the ‘Enemy-of-my-Enemy’ Alliances: Coalitions in Networked Contest Games,” in *2023 62nd IEEE Conference on Decision and Control (CDC)*, IEEE, 2023, pp. 2220–2225
- **G. Díaz-García**, C. A. Uribe, and N. Quijano, “Population Dynamics for Discrete Wasserstein Gradient Flows over Networks,” in *International Conference on Machine Learning Conference: LatinX in AI (LXAI) Research Workshop. [Oral Presentation]*, 2021, Virtual
- **G. Díaz-García**, L. F. Giraldo, and S. Jimenez-Leudo, “Dynamics of a differential wheeled robot: Control and trajectory error bound,” in *2021 IEEE 5th Colombian Conference on Automatic Control (CCAC)*, IEEE, 2021, pp. 25–30
- J. Martinez-Piazuelo, **G. Díaz-García**, N. Quijano, and L. F. Giraldo, “Distributed Formation Control of Mobile Robots using Discrete-Time Distributed Population Dynamics,” in *Proceedings of the 21st IFAC World Congress*, vol. 53, Elsevier, 2020, pp. 3131–3136
- **G. Díaz-García**, L. Burbano, N. Quijano, and L. F. Giraldo, “Distributed MPC and Potential Game Controller for Consensus in Multiple Differential-Drive Robots,” in *Proceedings of the 2019 IEEE 4th Colombian Conference on Automatic Control (CCAC)*, IEEE, 2019, pp. 1–6

## Teaching Experience

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### Graduate Teaching Assistanship

DIGITAL CONTROL SYSTEMS - THEORY AND DESIGN  
University of California, Santa Barbara

*Santa Barbara, California, USA*

*Jan 2024 - Mar 2024*

### Graduate Teaching Assistanship

FEEDBACK CONTROL SYSTEMS - THEORY AND DESIGN  
University of California, Santa Barbara

*Santa Barbara, California, USA*

*Sept 2022 - Dec 2022*

### Graduate Teaching Assistanship

SIGNAL ANALYSIS AND PROCESSING  
University of California, Santa Barbara

*Santa Barbara, California, USA*

*Jan 2022 - Mar 2022*

### Graduate Teaching Assistanship

CONTROL SYSTEMS ANALYSIS  
University of Los Andes

*Bogotá, Colombia*

*Aug 2018 - Nov 2018*

### Graduate Teaching Assistanship

STOCHASTIC PROCESSES  
University of Los Andes

*Bogotá, Colombia*

*Jan 2018 - Jun 2018*

### Graduate Teaching Assistanship

OPTIMIZATION  
University of Los Andes

*Bogotá, Colombia*

*Jan 2018 - Jun 2018*

### Undergraduate Teaching Assistanship

COURSE ON SCIENTIFIC COMPUTING FOR ENGINEERING  
University of Los Andes

*Bogotá, Colombia*

*Aug 2017 - Nov 2017*

### Undergraduate Teaching Assistanship

CONTROL SYSTEMS ANALYSIS  
University of Los Andes

*Bogotá, Colombia*

*Aug 2016 - Nov 2017*

### Undergraduate Teaching Assistanship

ALGORITHMIC AND OBJECT ORIENTED PROGRAMMING II (HONORS)  
University of Los Andes

*Bogotá, Colombia*

*Aug 2016 - Nov 2016*

## Undergraduate Teaching Assitanship

ALGORITHMIC AND OBJECT ORIENTED PROGRAMMING I  
University of Los Andes

*Bogotá, Colombia*

*Jan 2015 – Jun 2016, Jan 2017 - Jun 2017*

## Research Experience

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### Research Assitanship

COMPUTATIONAL MODELS OF COOPERATION IN UNDERPRIVILEGED COMMUNITIES  
University of Los Andes. Funded through Google Latin America Research Awards.

*Bogotá, Colombia*

*Jan 2019 – Nov 2020*

## Reviewing Experience

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### International Journals

- IEEE Control Systems Letters
- IEEE Transactions on Neural Networks and Learning Systems
- IEEE Transactions on Systems, Man and Cybernetics: Systems
- IEEE Transactions on Cybernetics
- International Journal of Robust and Nonlinear Control
- Peer-to-Peer Networking and Applications
- Mathematics of Control, Signals, and Systems
- Applied Network Science
- Nonlinear Dynamics

### International Conferences

- European Control Conference, 2024
- American Control Conference, 2024
- IEEE Conference on Decision and Control, 2023
- IFAC World Congress, 2023, 2020
- IEEE Conference on Control Technology and Applications, 2020
- IEEE Colombian Conference on Automatic Control, 2019

## Academic Awards & Honors

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### M.Sc. in Electronic and Computer Engineering Cum Laude Honor

UNIVERSITY OF LOS ANDES

Honor for high academic performance. Top 3% GPA in M.Sc. in Electronic and Computer Engineering class for the past five years.

*Bogotá, Colombia*

*Mar 2020*

### Google Latin America Research Awards

GOOGLE LATIN AMERICA

Project: “Computational Models of Cooperation in Underprivileged Communities”.

*Bello Horizonte, Brazil*

*Nov 2018 & Nov 2019*

### “Bachilleres Por Colombia - Mario Galán Gómez” Award

ECOPETROL S.A.

Scholarship for undergraduate studies in Colombia. Award for the best high school students in Colombia.

*Bogotá, Colombia*

*Sept 2013*

### “Los Mejores en Educación” Award

MINISTRY OF EDUCATION

Award for the high school students with higher grades in ICFCES national test in Colombia.

*Bogotá, Colombia*

*Dic 2012*

## Additional Skills

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**Languages** English (Fluent), Spanish (Native)

**Programming Languages** Matlab & Simulink, Python, Java, C++