Diego Salazar D'Antonio

diego.s.dantonio@lehigh.edu Scholar diegosdantonio website

Personal statement

I am a Ph.D. student in Computer Science and Engineering at Lehigh University, where I am working under the guidance of Professor David Saldaña. I am a member of both the Swarms lab and the Autonomous and Intelligent Robotics Laboratory (AIRLab), both of which are dedicated to cutting-edge research in the field of robotics. My research interests lie in the area of object manipulation with deformable objects, such as cables and cloth, using aerial robots, particularly quadrotors. I am excited about the potential applications of this technology in various fields, such as automated manufacturing, logistics, and search and rescue. During my Master's degree, I had the privilege of serving as the chair of both the IEEE student branch chapter and the industrial application society at the University of Ibagué. Through these experiences, I honed my leadership and organizational skills, which have been invaluable in my current role as a Ph.D. student.

Education

2020 – 2025 **Ph.D. in Computer Science and Engineering** (Member: AIRLab) at Lehigh University
Thesis advisor: Dr. David Saldaña

2018 – 2020 **M.Sc. Control engineering** at University of Ibagué.
Thesis advisor: Dr. Oswaldo López

2008 – 2012 **Bachelor's in Computer engineering** at University of Ibagué.
Thesis advisor: Dr. Oscar Barrero

Employment History

2021 – · · · **PhD Student,** at Lehigh University.

2022 – · · · **Teacher assistant,** at Lehigh University.

2021 – 2022 **Research Assistant,** Lehigh University.

2019 – 2021 **Visiting Scholar,** at Lehigh University.

2018 – 2019 **Instructor.** Teachig: digital electronics, at Universitad de Ibagué.

2012 – 2018 **Engineering and innovation department manager** , at Ideas Disruptivas.

Research Publications

Journal Articles

1 **Diego S. D'Antonio**, O. López-Santos, A. Navas-Fonseca, F. Flores-Bahamonde, and M. A. Pérez, "Multi-mode master-slave control approach for more modular and reconfigurable hybrid microgrids," *IEEE Access*, vol. 11, pp. 55 334–55 348, 2023. DOI: 10.1109/ACCESS.2023.3280449.

2 O. López-Santos, M. C. Salas-Castaño, and **Diego S. D'Antonio**, "Continuous simulation of the power flow in ac-dc hybrid microgrids using simplified modelling," *Computation*, vol. 10, no. 4, 2022, ISSN: 2079-3197. DOI: 10.3390/computation10040052.

3 **Diego S. D'Antonio**, G. A. Cardona, and D. Saldaña, "The catenary robot: Design and control of a cable propelled by two quadrotors," *IEEE Robotics and Automation Letters*, vol. 6, no. 2, pp. 3857–3863, 2021. DOI: 10.1109/LRA.2021.3062603.

4 S. Mayya, **Diego S. D'Antonio**, D. Saldaña, and V. Kumar, "Resilient task allocation in heterogeneous multi-robot systems," *IEEE Robotics and Automation Letters*, vol. 6, no. 2, pp. 1327–1334, 2021. DOI: 10.1109/LRA.2021.3057559.

5. O. Lopez-Santos, C. A. Jacanamejoy-Jamioy, **Diego S. D'Antonio**, J. R. Corredor-Ramírez, G. Garcia, and L. Martinez-Salamero, "A single-phase transformer-based cascaded asymmetric multilevel inverter with balanced power distribution," *IEEE Access*, vol. 7, pp. 98 182–98 196, 2019. DOI: 10.1109/ACCESS.2019.2930230.

Conference Proceedings

1. **Diego S. D'Antonio**, S. Bhattacharya, and D. Saldaña, "Forming and controlling hitches in midair using aerial robots," in *IEEE International Conference on Robotics and Automation (ICRA), Paper accepted*, 2023.
2. J. Xu, **Diego S. D'Antonio**, D. J. Ammirato, and D. Saldaña, "Qblimp: Design, model, and translational motion control for a quadrotor-blimp," in *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2023.
3. **Diego S. D'Antonio** and D. Saldaña, "Folding knots using a team of aerial robots," in *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2022, pp. 3372–3377. DOI: 10.1109/IROS47612.2022.9981363.
4. G. A. Cardona, **Diego S. D'Antonio**, R. Fierro, and D. Saldaña, "Adaptive control for cooperative aerial transportation using catenary robots," in *2021 Aerial Robotic Systems Physically Interacting with the Environment (AIRPHARO)*, 2021, pp. 1–8. DOI: 10.1109/AIRPHARO52252.2021.9571068.
5. G. A. Cardona, **Diego S. D'Antonio**, C.-I. Vasile, and D. Saldaña, "Non-prehensile manipulation of cuboid objects using a catenary robot," in *2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2021, pp. 5270–5275. DOI: 10.1109/IROS51168.2021.9636820.
6. J. Xu, **Diego S. D'Antonio**, and D. Saldaña, "H-modquad: Modular multi-rotors with 4, 5, and 6 controllable dof," in *2021 IEEE International Conference on Robotics and Automation (ICRA)*, 2021, pp. 190–196. DOI: 10.1109/ICRA48506.2021.9561016.
7. **Diego S. D'Antonio**, N. Meneses-Casas, M. G. Forero, and O. López-Santos, "Automatic fault detection in a cascaded transformer multilevel inverter using pattern recognition techniques," in *Pattern Recognition and Image Analysis*, A. Morales, J. Fierrez, J. S. Sánchez, and B. Ribeiro, Eds., Cham: Springer International Publishing, 2019, pp. 378–385, ISBN: 978-3-030-31332-6.
8. O. Lopez-Santos, J. R. Corredor, and **Diego S. D'Antonio**, "Computational tool for simulation and automatic testing of a single-phase cascaded multilevel inverter," in *Applied Computer Sciences in Engineering*, J. C. Figueroa-García, E. R. López-Santana, and J. I. Rodriguez-Molano, Eds., Cham: Springer International Publishing, 2018, pp. 509–522, ISBN: 978-3-030-00350-0.

Books and Chapters

1. O. Lopez-Santos, **Diego S. D'Antonio**, F. Flores-Bahamonde, and C. A. Torres-Pinzón, "Chapter 2 - hysteresis control methods," in *Multilevel Inverters*, E. Kabalci, Ed., Academic Press, 2021, pp. 35–60, ISBN: 978-0-323-90217-5. DOI: https://doi.org/10.1016/B978-0-323-90217-5.00002-2.

Workshops

1. **Diego S. D'Antonio**, J. Xu, G. A. Cardona, and D. Saldaña, *Customizable-modquad: A versatile hardware-software platform to develop lightweight and low-cost aerial vehicles*, 2022.

Misc

1. K. Li, S. Hou, M. Negash, *et al.*, *A novel low-cost, recyclable, easy-to-build robot blimp for transporting supplies in hard-to-reach locations*, 2023. arXiv: 2309.06682 [cs.RO].

2 J. Xu, **Diego S. D'Antonio**, and D. Saldaña, *Modular multi-rotors: From quadrotors to fully-actuated aerial vehicles*, 2022. DOI: 10.48550/ARXIV.2202.00788.

Positions and service

- Reviewer at IEEE Transactions on Robotics (T-RO) (Journal)
- Reviewer at IEEE Transactions on Automation Science and Engineering (T-ASE) (Journal)
- Reviewer at IEEE Robotics and Automation Letters (Journal)
- Reviewer at IEEE Reviewer at IEEE Access (Journal)
- Reviewer at IEEE International Conference on Robotics and Automation (ICRA) (Top Robotics Conference)
- Reviewer at IEEE International Conference on Intelligent Robots and Systems (IROS) (Top Robotics Conference)
- Senior Reviewer at IEEE RAS Young Reviewers Program (YRP)
- Judge at the 2023 Lehigh Valley Science and Engineering Research Fair.

Educational outreach

06/24/2023	One-morning robotics competition for middle-school girls. Lehigh AIRLab organized the robotics activity for the 2023 CHOICES program on June 22 & 29.
12/20/2022	Computer science research fair, robotics demonstration at LEAP Academy University Charter School.
12/06/2022	Presentation and robotics demonstration of "Aerial versatile robots" to LEAP Academy University Charter School focuses on encouraging minorities to join STEAM.
12/11/2021	Presentation to LEAP Academy University Charter School called "Computer Science Kick Off."

Research Mentoring

S'2021	Ruth Densamo, senior undergrad at Lehigh University
F'2021	Jitong Ding, senior undergrad at Lehigh University
F'2022	Karen Li, junior undergrad at Lehigh University
	Michael Fitzgerald, junior undergrad at Lehigh University
	Alex Witt, senior undergrad at Lehigh University
	Dominic Ammirato, senior undergrad at Lehigh University
S'2023	Shuhang Hou, master student at Lehigh University
	Leonardo Santens, master student at Lehigh University
	Bingxu Zhao, master student at Lehigh University
	Jared Lee, master student at Lehigh University
	Alexander Towle, undergrad student at Lehigh University

Skills

Languages	Strong reading, writing and speaking competencies for English, Spanish.
Coding	Python, C, C++, ROS, LaTeX, …
Robot platforms	Quadrotors, blimps, catenary robots, ground robot.
Misc.	Academic research, teaching, training, consultation, LaTeX typesetting and publishing.

Miscellaneous Experience

Awards and Achievements

2022 **Travel award** for International Conference on Robotics and Automation (ICRA).

Travel award for IEEE International Conference on Intelligent Robots and Systems (IROS).

Travel award for Robotics: Science and Systems Conference.

2018 **Finalist Minidrone Competition** Awarded by MathWorks.

Certification

2022 **Certified Teacher development series level I**. Awarded by Lehigh University.

2023 **Certified Teacher development series level II**. Awarded by Lehigh University.

References

Available on Request