Daniel Zelazo | Curriculum Vitae

Faculty of Aerospace Engineering, Technion-Israel Institute of Technology
Technion City, Haifa, 32000 – Israel
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Education

University of Washington **Seattle, WA**
Ph.D. *2004-2009*
Aeronautics & Astronautics Engineering

thesis: *Graph-theoretic Methods for the Analysis and Synthesis of Networked Dynamic Systems*

supervisors: Prof. Mehran Mesbahi

Massachusetts Institute of Technology **Cambridge, MA**
M.Eng. *1999–2001*
Electrical Engineering & Computer Science

thesis: *Study of a MEMS Laser Range Finder: Integration, Performance and Design of a 2-Axis Mirror Control System*

supervisors: Prof. Jeffery Lang (MIT), Dr. Mark Mescher (Draper Laboratory)

Massachusetts Institute of Technology **Cambridge, MA**
B.Sc. *1995–1999*
Electrical Engineering & Computer Science

Academic Appointments

Technion-Israel Institute of Technology **Haifa, Israel**
Faculty of Aerospace Engineering
Associate Professor *July 2018 - Present*
Director of the Philadelphia Flight Control Laboratory *January 2020 - Present*

Technion-Israel Institute of Technology **Haifa, Israel**
Faculty of Aerospace Engineering
Assistant Professor *October 2012 - July 2018*

University of Stuttgart **Stuttgart, Germany**
Institute for Systems Theory & Automatic Control
Research Associate & Lecturer *March 2010 - September 2012*

University of Washington **Seattle, WA**
Research Associate *September 2009 - February 2010*

University of Washington **Seattle, WA**
Research Assistant *January 2005 - August 2009*

Draper Laboratory **Cambridge, MA**
Autonomous Systems Group
Research Assistant, Draper Fellow *September 1999 - February 2001*

Teaching Experience

Advanced Control Laboratory (085705) **Technion**
Lecturer, Spring 2020, 2021, 2022

Analysis and Control of Multi-Agent Systems **Rafael Advanced Defense Systems Ltd.**
Lecturer, July 2018

Robust Control Theory (088792) **Technion**
Lecturer, Spring 2016, 2018, 2021

Control Theory (084738) **Technion**
Lecturer, Winter 2015, 2016, 2017, 2020, 2021

Networked Dynamic Systems (086730) **Technion**
Lecturer, Spring 2013, 2014, 2015, 2017, 2018 Winter 2015, 2019, 2021

Undergraduate Seminar in Control Theory (085804) **Technion**
Lecturer, Spring 2015, 2017 Winter 2019

Dynamic Systems (084730/084737) **Technion**
Lecturer, Winter 2013/14, 2014/15

Analysis and Control of Multi-Agent Systems **University of Stuttgart**
Lecturer, Winter 2011, 2012, Summer 2013, 2014, 2015

Hauptseminar Technische Kybernetik **University of Stuttgart**
Lecturer, Winter 2010

Linear Systems Theory **University of Washington**
Teaching Assistant, Winter 2005

Design of Automatic Control Systems **University of Washington**
Teaching Assistant, Winter 2005

Control Systems Sensors and Actuators **University of Washington**
Teaching Assistant, Spring 2004

Work Experience

Bellevue Montessori School **Bellevue, WA**
Physical Science Specialist - Teacher *September 2005 – June 2009*
Physical science teacher for grades 3-5.

Sagetech Corporation **Hood River, OR**
Lead Control Systems Engineer *June 2005 – January 2006*
Developed control, guidance, and navigation algorithms for DARPA funded Peregrine UAV Killer project.

Junshin Girls' School **Tokyo, Japan**
English Teacher *September 2003 – April 2004*
English conversation teacher for middle school and high school.

Texas Instruments Japan Ltd. **Tsukuba, JP**
Research Engineer *March 2001 – July 2003*
Conceived and developed a TI proprietary technology on wavelet based perceptual compression of audio sample sets.

Funded Research Grants

Rafael Academy **200,000NIS**
PIs: *Daniel Zelazo, Liat Peled-Eitan (Rafael)* *1.2021 – 12.2022*
Network Defense Against Enemy Swarms

Crown Vanguard Award for Science and Technology Fund **$125,000**
PI: *Daniel Zelazo* *2020*
Control of Complex and Multi-Agent Networks

Israel Science Foundation (ISF) **1,040,000NIS - 4 years**
PI: *Daniel Zelazo* *10.2020 – 09.2024*
Open Multi-Agent Networks: Limiting Behaviors and Model Reduction

NSF-BSF **$168,354 - 3 years**
PIs: *Daniel Zelazo, Xudong Chen (University of Colorado - Boulder),*
Muhamed Ali Belabbas (University of Illinois, Urbana-Champagne) *10.2018 – 09.2021*
Foundations of Secure Multi-agent Networked Systems

Israel Ministry of Energy **375,000NIS - 1 year**
PIs: *Daniel Zelazo, Beni Cukurel (Technion)* *10.2018 – 09.2019*
Optimal Economic Dispatch of CHP Micro Gas Turbines

Technion Autonomous Systems Program **$34,500 - 1 year**
PI: *Daniel Zelazo* *12.2017 – 11.2018*
Coordination and Control of Multi-Agent Systems in Harsh Environments

Israel Ministry of Defense **100,000NIS - 1 year**
PI: *Daniel Zelazo* *12.2017 – 11.2018*
Coordination of UAV Teams with Communication Constraints: Coverage and Formation Control with Mobile Relays

Grand Technion Energy Program **$40,000 - 2 years**
PIs: *Daniel Zelazo, Beni Cukurel (Technion)* *04.2015 – 03.2017*
Optimal Operation of the Smart-Grid Equipped with a Distributed Network of Micro-Gas Turbines

German-Israeli Foundation (GIF) **€180,000 - 4years**
PIs: *Daniel Zelazo, Frank Allgöwer (University of Stuttgart)* *01.2014 – 12.2018*
A Duality Framework for the Analysis and Design of Networked Dynamical Systems

Israel Science Foundation (ISF) **800,000NIS - 5 years**
PI: *Daniel Zelazo* *10.2013 – 09.2018*
Analysis and Design of Robust Networked Dynamic Systems

Student Advising and Mentoring

Post-Docs

Dr. Marco Fabris: Technion *January 2020 - September 2021*

Dr. Anoop Jain: Technion *November 2017 - June 2019*

Dr. Dwaipayan Mukherjee: Technion *June 2015 - November 2017*

Dr. Shiyu Zhao: Technion *April 2014 - July 2015*

PhD

Gal Barkai: Technion *January 2021 - Present*

Noam Leiter: Technion *March 2022*

Miel Sharf: Technion *February 2020*

Master

Evyatar Matmon: Technion *March 2022 - Present*
Jiacheng Shi: Technion *November 2021 - Present*
Shahar Ashkenazi: Technion *October 2021 - Present*
Aviv Priel: Technion *April 2022*
Nati Peleg: Technion *March 2022*
Nathaniel Drelich: Technion *July 2021*
Mayank Sewlia: Technion *August 2020*
Yoav Palti: Technion *November 2019*
Douglas Goldenberg: Technion *December 2018*
Yaniv Ben Shoushan: Technion *December 2016*
Oshri Rozenheck: Technion *June 2016*

Undergraduate/Diploma

Amit Enbal: Technion (Silon) *2021*
Benjamin Briegel: University of Stuttgart *2011*
Jing Qi: University of Stuttgart *2011*

Visiting Students

Chuang Xu: Harbin Institute of Technology (China) *August 2021 - August 2022*
Hao Chen: National University of Defense Technology (China) *November 2017 - December 2018*
Daniel Frank: University of Stuttgart (Germany) *October 2017 - March 2018*
Minh Trinh Hoang: Gwangju Institute of Science & Technology (Korea) *March 2016 - August 2016*
Miguel Dias: Instituto Superior Técnico (Portugal) *August 2016 - September 2016*
Johannes Rist: Technical University Munich (Germany) *June 2016 - August 2016*

External Thesis Committees

Maor Braksmayer: Technion (Israel), PhD *October 2021*
Alessia Benevento: University of Bologna (Italy), PhD *February 2021*
Daniel Frank: University of Stuttgart (Germany), MSc *July 2018*
David Dovrat: Technion (Israel), MSc *January 2017*
Geoff Stacey: Australian National University (Australia), PhD *January 2017*
Levi Itshak Bellaiche: Technion (Israel), MSc *August 2015*
Simone Schuler: University of Stuttgart (Germany), PhD *March 2014*
Orel Ron: Tel Aviv University (Israel), MSc *March 2014*

Outreach

Joyce Yoon: Massachusetts Institute of Technology *January 2021 - June 2021*
MISTI-Israel Internship
Liran Attar: Israel Ministry of Education *January 2016 - Present*
Mentor high-school student on a year-long research project

Professional Activities

Memberships

- IEEE Senior Member (2019 - present)
- Member IEEE CSS Technical Committee on Networks and Communications (2015 - present)
- Member IEEE RAS Technical Committee on Multi-Robot Systems (2014 - present)
- Member IFAC Technical Committee 1.5: Networked Systems (2014 - present)

Editorial Boards, Conferences, and Symposiums

Israel Science Foundation: Review Panel (2021)

Organizer-Workshop *Foundations of Formation Control*: Israel Association of Automatic Control 2019

Subject Editor: International Journal of Robust and Nonlinear Control Mar. 2019 - Present

Program Chair: The 27th Mediterranean Conference on Control and Automation 2019

Publicity Chair: The 27th Mediterranean Conference on Control and Automation 2019

Associate Editor : IEEE Control Systems Letters (L-CSS) Jan. 2017 - Dec. 2020

Organizer-Workshop *Rigidity theory for multi-agent systems meets parallel robots: Towards the discovery of common models and methods*: IFAC World Congress 2017

Associate Editor (contributed papers): 7th IFAC Workshop on Distributed Estimation and Control in Networked Systems (NeCSys) 2018, 56th Israel Annual Conference on Aerospace Sciences (IACAS) 2016, Symposium on Mathematical Theory of Networks and Systems (MTNS) 2014

Organizer-Invited Session *Rigidity theory for problems in multi-robot coordination* : IEEE Conference on Decision and Control (CDC) 2015

Program Committee: International Symposium on Swarm Behavior and Bio-Inspired Robotics (2015,2020), Symposium on Mathematical Theory of Networks and Systems (MTNS) 2016, International Symposium on Multi-robot and Multi-Agent Systems 2017

Session Chair: IEEE Conference on Decision and Control (CDC) 2011,2014,2017,2018,2019 International Conference on Signal Processing 2002

Reviewer

- IEEE Transactions on Automatic Control
- IEEE Transactions on Control of Network Systems
- IEEE Transactions on Robotics
- IEEE Transactions on Network Science and Engineering
- IEEE Transactions on Control Systems Technology
- Automatica
- Systems & Control Letters
- ACM Transactions on Embedded Computing
- Communications in Nonlinear Science and Numerical Simulations
- International Conference on Robotics and Automation
- Linear Algebra and its Applications
- Autonomous Robots
- European Physics Journal Special Topics
- International Journal of Control

- International Journal of Robust and Nonlinear Control
- Journal of Mathematical Analysis and Applications
- European Journal of Control
- Transactions on Mobile Computing
- Conference on Robot Communication and Coordination
- IEEE Conference on Decision and Control
- IEEE Multi-conference on Systems and Control
- IEEE Transactions on Aerospace and Electronic Systems
- Scientific Reports (Nature)
- Journal of Guidance, Control, and Navigation
- American Control Conference
- IFAC Word Congress
- European Control Conference
- Israeli Annual Conference on Aerospace Sciences

Volunteer Work

MIT Educational Counselor: Interview prospective MIT students *2014 - present*

Awards, Honors, and Prizes

Outstanding Contribution in Reviewing: J. Mathematical Analysis & Applications *2017*

L. Kraus Research Fund: Technion Research Authority ($3,600) *2017*

Hanin Prize: Outstanding Young Faculty in Aerospace ($3,000) *2017*

Special Research Grant: Technion Research Authority ($10,000) *2016*

J. and J. Gringorten Aeronautical Research Fund: Technion ($1,500) *2015*

Finalist - Best Student Paper: AIAA Infotech@Aerospace Conference *2009*

Best Presentation in Session: American Control Conference *2008*

Andris Vagners Memorial Fellowship: University of Washington *2006*

Draper Laboratory Fellow: Draper Laboratory *1999-2001*

Languages

- **English**: Native
- **Japanese**: Limited working proficiency
- **Hebrew**: Professional working proficiency
- **German**: Limited working proficiency

Publications, Patents, and Invited Talks

Journals

[1] M. Fabris and D. Zelazo, "Secure consensus via objective coding: Robustness analysis to channel tampering," *IEEE Transactions on Systems, Man and Cybernetics: Systems (early access)*, Jun. 2022.

[2] M. Sharf and D. Zelazo, "Monitoring link faults in nonlinear diffusively-coupled networks," *IEEE Transactions on Automatic Control*, vol. 67, no. 6, pp. 2857–2872, Jun. 2022.

[3] C. Virginis, D. Zelazo, and D. V. Dimarogonas, "Cooperative manipulation via internal force regulation: A rigidity theory perspective," *IEEE Transactions on Control of Network Systems (early access)*, Jun. 2022.

[4] M. Fabris and D. Zelazo, "Bearing-based autonomous communication relay positioning under field-of-view constraints," *Advanced Control for Applications*, vol. 4, no. 2, e103, Mar. 2022.

[5] M. Sharf, A. Romer, D. Zelazo, and F. Allgower, "Model-free practical cooperative control for diffusively coupled systems," *IEEE Transactions on Automatic Control*, vol. 67, no. 2, pp. 754–766, Feb. 2022.

[6] E. Michael, C. Manzie, T. A. Wood, D. Zelazo, and I. Shames, "Gradient free cooperative seeking of a moving source," *Automatica (submitted)*, Jan. 2022.

[7] M. Sharf, I. Romm, M. Palman, D. Zelazo, and B. Cukurel, "Economic dispatch of a single micro-gas turbine under chp operation with uncertain demands," *Applied Energy*, vol. 309, pp. 1–13, Jan. 2022.

[8] G. Barkai, L. Mirkin, and D. Zelazo, "On sampled-data consensus: Divide and concur," *IEEE Control Systems Letters*, vol. 6, pp. 343–348, 2022.

[9] A. Priel and D. Zelazo, "Event-triggered consensus kalman filtering for time-varying networks and intermittent observations," *International Journal on Robust and Nonlinear Control (submitted)*, 2022.

[10] M. Sewlia and D. Zelazo, "Bearing-based formation stabilization using event-triggered control," *International Journal on Robust and Nonlinear Control (submitted)*, 2022.

[11] C. Xu, D. Zelazo, and B. Wu, "Robust formation control for second-order multi-agent systems using bearing measurement," *International Journal on Robust and Nonlinear Control (submitted)*, 2022.

[12] G. Michieletto, D. Zelazo, and A. Cenedese, "A general and unified dissertation on bearing rigidity theory," *IEEE Transactions on Control of Network Systems*, vol. 8, no. 4, pp. 1624–1636, Dec. 2021.

[13] M. Sharf, A. Jain, and D. Zelazo, "A geometric method for passivation and cooperative control of equilibrium-independent passivity-short systems," *IEEE Transactions on Automatic Control*, vol. 66, no. 12, pp. 5877–5892, Dec. 2021.

[14] M.-A. Belabbas, X. Chen, and D. Zelazo, "On structural rank and resilience of sparsity patterns," *IEEE Transactions on Automatic Control (submitted)*, Sep. 2021.

[15] N. Leiter and D. Zelazo, "Product form of projection-based model reduction and its application to multi-agent systems," *Automatica (submitted)*, Sep. 2021.

[16] M. Sharf and D. Zelazo, "A passivity-based network identification algorithm with minimal time complexity," *IEEE Transactions on Control of Network Systems (submitted)*, Sep. 2021.

[17] N. Leiter and D. Zelazo, "Edge-matching graph contractions and their interlacing properties," *Linear Algebra and its Applications*, vol. 612, pp. 289–317, Mar. 2021.

[18] M. H. Trinh, D. Zelazo, and H. Ahn, "Pointing consensus and bearing-based solutions to the fermat-weber location problem," *IEEE Transactions on Automatic Control*, vol. 65, no. 6, pp. 2339–2354, Jun. 2020.

[19] H. Chen, D. Zelazo, X. Wang, and L. Shen, "Convergence analysis of signed nonlinear networks," *IEEE Transactions on Control of Network Systems*, vol. 7, no. 1, pp. 189–200, Apr. 2020.

[20] D. Muhkerjee and D. Zelazo, "Robustness of consensus over weighted digraphs," *IEEE Transactions on Network Sciences and Engineering*, vol. 6, no. 4, pp. 657–670, Dec. 2019.

[21] ——, "Consensus of higher order agents: Robustness and heterogeneity," *IEEE Transactions on Control of Network Systems*, vol. 6, no. 4, pp. 1323–1333, Dec. 2019.

[22] M. Sharf and D. Zelazo, "A characterization of all passivizing input-output transformations of a passive-short system," *Automatica (submitted)*, Nov. 2019.

[23] ——, "Analysis and synthesis of mimo multi-agent systems using network optimization," *IEEE Transactions on Automatic Control*, vol. 64, no. 11, pp. 1558–2523, Nov. 2019.

[24] D. Zelazo and S. Zhao, "Formation control and rigidity theory," *Snapshots of Modern Mathematics from Oberwolfach*, no. 12, pp. 1–16, Nov. 2019.

[25] M. Sharf and D. Zelazo, "Network feedback passivation of passivity-short multi-agent systems," *IEEE Control Systems Letters*, vol. 3, no. 3, pp. 607–612, Jul. 2019.

[26] Q. Tran, M. H. Trinh, D. Zelazo, D. Muhkerjee, and H. Ahn, "Finite-time bearing-only formation control via distributed global orientation estimation," *IEEE Transactions on Control of Network Systems*, vol. 6, no. 2, pp. 702–712, Jun. 2019.

[27] S. Zhao and D. Zelazo, "Bearing rigidity theory and its applications for control and estimation of network systems: Life beyond distance rigidity," *IEEE Control Systems Magazine*, vol. 39, no. 2, pp. 66–83, Apr. 2019.

[28] M. H. Trinh, S. Zhao, Z. Sun, D. Zelazo, B. Anderson, and H. Ahn, "Bearing-based formation control of a group of agents with leader-first follower structure," *IEEE Transactions on Automatic Control*, vol. 64, no. 2, pp. 598–613, Feb. 2019.

[29] Y. Liu, J. Montenbruck, D. Zelazo, M. Odelga, S. Rajappa, H. Bülthoff, F. Allgöwer, and A. Zell, "A distributed control approach to formation balancing and maneuvering of multiple multirotor uavs," *IEEE Transactions on Robotics*, vol. 34, no. 4, pp. 870–882, Aug. 2018.

[30] M. H. Trinh, D. Muhkerjee, D. Zelazo, and H. Ahn, "Formations on directed cycles with bearing-only measurements," *International Journal of Robust and Nonlinear Control*, vol. 28, no. 3, pp. 1074–1096, Feb. 2018.

[31] A. Jain, M. Sharf, and D. Zelazo, "Regularization and feedback passivation in cooperative control of passivity-short systems: A network optimization perspective," *IEEE Control Systems Letters*, vol. 2, no. 4, pp. 731–736, 2018.

[32] J. M. Montenbruck, D. Zelazo, and F. Allgöwer, "Fekete points, formation control, and the balancing problem," *IEEE Transactions on Automatic Control*, vol. 62, no. 10, pp. 5069–5081, Oct. 2017.

[33] S. Zhao and D. Zelazo, "Translational and scaling formation maneuver control via a bearing-based approach," *IEEE Transactions on Control of Network Systems*, vol. 4, no. 3, pp. 429–438, Sep. 2017.

[34] J. Rist, M. Dias, M. Palman, D. Zelazo, and B. Cukurel, "Economic dispatch of a single micro-gas turbine under chp operation," *Applied Energy*, vol. 200, pp. 1–18, May 2017.

[35] M. Sharf and D. Zelazo, "A network optimization approach to cooperative control synthesis," *IEEE Control Systems Letters*, vol. 1, no. 1, pp. 86–91, 2017.

[36] D. Zelazo and M. Bürger, "On the Robustness of Uncertain Consensus Networks," *IEEE Transactions on Control of Network Systems*, vol. 4, no. 2, pp. 170–178, 2017.

[37] S. Zhao and D. Zelazo, "Bearing-Only Network Localization: Localizability, Sensitivity, and Distributed Protocols," *Automatica*, vol. 69, pp. 334–341, 2016.

[38] ——, "Bearing rigidity and almost global bearing-only formation stabilization," *IEEE Transactions on Automatic Control*, vol. 61, no. 6, pp. 1255–1268, 2016.

[39] D. Zelazo, A. Franchi, H. H. Bülthoff, and P. Robuffo Giordano, "Decentralized Rigidity Maintenance Control with Range-only Measurements for Multi-Robot Systems," *International Journal of Robotics Research*, vol. 34, no. 1, pp. 105–128, Jan. 2015.

[40] M. Bürger, D. Zelazo, and F. Allgöwer, "Duality and network theory in passivity-based cooperative control," *Automatica*, vol. 50, no. 8, pp. 2051–2061, Aug. 2014.

[41] ——, "Hierarchical Clustering of Dynamical Networks Using a Saddle-Point Analysis," *IEEE Transactions on Automatic Control*, vol. 58, no. 1, pp. 113–124, Jan. 2013.

[42] D. Zelazo, M. Bürger, and F. Allgöwer, "A Finite-Time Dual Method for Negotiation between Dynamical Systems," *SIAM Journal on Control and Optimization*, vol. 51, no. 1, pp. 172–194, Jan. 2013.

[43] D. Zelazo, S. Schuler, and F. Allgöwer, "Cycles and Performance in Consensus Networks," *Systems & Control Letters*, vol. 62, no. 1, pp. 85–96, Jan. 2013.

[44] D. Zelazo, R. Dai, and M. Mesbahi, "An energy management system for off-grid power systems," *Energy Systems*, vol. 3, no. 2, pp. 153–179, Jan. 2012.

[45] D. Zelazo and M. Mesbahi, "Graph-Theoretic Analysis and Synthesis of Relative Sensing Networks," *IEEE Transactions on Automatic Control*, vol. 56, no. 5, pp. 971–982, May 2011.

[46] ——, "Edge Agreement: Graph-Theoretic Performance Bounds and Passivity Analysis," *IEEE Transactions on Automatic Control*, vol. 56, no. 3, pp. 544–555, Mar. 2011.

Peer Reviewed Conferences

[47] G. Barkai, L. Mirkin, and D. Zelazo, "On Internal Stability of Diffusive-Coupling and the Dangers of Cancel Culture," in *25th International Symposium on Mathematical Theory of Networks and Systems (accepted)*, Germany, Sep. 2022.

[48] M. Sharf and D. Zelazo, "Cluster Assignment in Multi-Agent Systems," in *The 13th Asian Control Conference*, Jeju Island, South Korea, May 2022, pp. 947–952.

[49] B. Pozzan, G. Michieletto, A. Cenedese, and D. Zelazo, "Heterogeneous Formation Control: a Bearing Rigidity Approach," in *IEEE Conference on Decision and Control*, Austin, Texas, Dec. 2021, pp. 6451–6456.

[50] A. Priel and D. Zelazo, "An Improved Distributed Consensus Kalman Filter Design Approach," in *IEEE Conference on Decision and Control*, Austin, Texas, Dec. 2021, pp. 502–507.

[51] E. Michael, D. Zelazo, T. A. Wood, C. Manzie, and I. Shames, "Optimization with Networked Zeroth-Order Oracles," in *IEEE Conference on Decision and Control*, Jeju Island, South Korea, Dec. 2020, pp. 5354–5359.

[52] T. Ikeda, D. Zelazo, and K. Kashima, "Maximum Hands-Off Distributed Bearing-Based Formation Control," in *IEEE Conference on Decision and Control*, Nice, France, Dec. 2019, pp. 4459–4464.

[53] A. Jain and D. Zelazo, "Temporal Circular Formation Control with Bounded Trajectories in a Uniform Flowfield," in *27th Mediterranean Conference on Control and Automation*, Akko, Israel, Jul. 2019, pp. 183–188.

[54] M. Sewlia and D. Zelazo, "Distributed Event-Based Control for Second-Order Multi-Agent Systems," in *27th Mediterranean Conference on Control and Automation*, Akko, Israel, Jul. 2019, pp. 304–309.

[55] M. Sharf and D. Zelazo, "Symmetry-Induced Clustering in Multi-Agent Systems using Network Optimization and Passivity," in *27th Mediterranean Conference on Control and Automation*, Akko, Israel, Jul. 2019, pp. 13–18.

[56] Y. Palti and D. Zelazo, "A Projected Lloyd's Algorithm for Coverage Control Problems," in *59th Israel Annual Conference on Aerospace Sciences*, Haifa, Israel, Mar. 2019, pp. 1008–1022.

[57] M. Sharf and D. Zelazo, "Network Identification: A Passivity and Network Optimization Approach," in *IEEE Conference on Decision and Control*, Miami, Florida, Dec. 2018, pp. 2107–2113.

[58] D. Zelazo, M. Mesbahi, and M.-A. Belabbas, "Graph Theory in Systems and Controls," in *IEEE Conference on Decision and Control*, Miami, Florida, Dec. 2018, pp. 6168–6179.

[59] D. Frank, D. Zelazo, and F. Allgöwer, "Bearing-Only Formation Control with Limited Visual Sensing: Two Agent Case," in *7th IFAC Workshop on Distributed Estimation and Control in Networked System*, Groningen, The Netherlands, Sep. 2018, pp. 28–33.

[60] M. H. Trinh, D. Zelazo, Q. V. Tran, and H.-S. Ahn, "Pointing consensus for rooted out-branching graphs," in *American Control Conference*, Milwaukee, WI, Jun. 2018, pp. 3648–3653.

[61] N. Leiter and D. Zelazo, "The Aggregating Consensus Protocol: A Case Study of Behavioral Multi-Agent Systems," in *58th Israel Annual Conference on Aerospace Sciences*, Haifa, Israel, Feb. 2018.

[62] D. Mukherjee and D. Zelazo, "Robust Consensus of Higher Order Agents over Cycle Graphs," in *58th Israel Annual Conference on Aerospace Sciences*, Haifa, Israel, Feb. 2018.

[63] M. H. Trinh, D. Mukherjee, D. Zelazo, and H.-S. Ahn, "Finite-time bearing-only formation control," in *IEEE Conference on Decision and Control*, Melbourne, Australia, Dec. 2017, pp. 1578–1583.

[64] S. Zhao, Z. Sun, D. Zelazo, M. H. Trinh, and H.-S. Ahn, "Laman Graphs are Generically Bearing Rigid in Arbitrary Dimensions," in *IEEE Conference on Decision and Control*, Melbourne, Australia, Dec. 2017, pp. 3356–3361.

[65] N. Leiter and D. Zelazo, "Graph-based model reduction of the controlled consensus protocol," in *IFAC World Congress*, Toulouse, France, Jul. 2017, pp. 9866–9871.

[66] M. H. Trinh, D. Mukherjee, D. Zelazo, and H.-S. Ahn, "Planar bearing-only cyclic pursuit for target capture," in *IFAC World Congress*, Toulouse, France, Jul. 2017, pp. 10 553–10 558.

[67] Y. Ben Shoushan and D. Zelazo, "Negotiation between dynamical systems with connectivity constraints," in *57th Israel Annual Conference on Aerospace Sciences*, Tel-Aviv, Israel, Feb. 2017.

[68] D. Mukherjee, M. H. Trinh, D. Zelazo, and H.-S. Ahn, "Bearing-only cyclic pursuit in 2-d for capture of moving target," in *57th Israel Annual Conference on Aerospace Sciences*, Tel-Aviv, Israel, Feb. 2017.

[69] J. Rist, M. Dias, D. Zelazo, B. Cukurel, and M. Palman, "Optimal combined heat and power integration of a micro-gas turbine unit in distributed energy generation," in *57th Israel Annual Conference on Aerospace Sciences*, Tel-Aviv, Israel, Feb. 2017.

[70] D. Mukherjee and D. Zelazo, "Consensus Over Weighted Digraphs: A Robustness Perspective," in *55th IEEE Conference on Decision and Control*, Las Vegas, Nevada, Dec. 2016, pp. 3438–3443.

[71] ——, "Robustness of Heterogeneous Cyclic Pursuit," in *56th Israel Annual Conference on Aerospace Sciences*, Haifa, Israel, Mar. 2016.

[72] F. Schiano, A. Franchi, D. Zelazo, and P. Giordano, "A Rigidity-Based Decentralized Bearing Formation Controller for Groups of Quadrotor UAVs," in *IEEE/RSJ International Conference on Intelligent Robots and Systems*, Daejeon, Korea, 2016, pp. 5099–5106.

[73] M. M. Montenbruck, D. Zelazo, and F. Allgöwer, "Retraction Balancing and Formation Control," in *54th IEEE Conference on Decision and Control*, Osaka, Japan, Dec. 2015, pp. 3645–3650.

[74] D. Zelazo, P. Giordano, and A. Franchi, "Bearing-Only Formation Control Using an $SE(2)$ Rigidity Theory," in *54th IEEE Conference on Decision and Control*, Osaka, Japan, Dec. 2015, pp. 6121–6126.

[75] S. Zhao and D. Zelazo, "Bearing-Based Formation Stabilization with Directed Interaction Topologies," in *54th IEEE Conference on Decision and Control*, Osaka, Japan, Dec. 2015, pp. 6115–6120.

[76] ——, "Bearing-Based Formation Maneuvering," in *IEEE International Symposium on Intelligent Control*, Sydney, Australia, Sep. 2015, pp. 658–663.

[77] O. Rozenheck, S. Zhao, and D. Zelazo, "A Proportional-Integral Controller for Distance-Based Formation Tracking," in *European Control Conference*, Linz, Austria, Jul. 2015, pp. 1693–1698.

[78] S. Zhao and D. Zelazo, "Bearing-Based Distributed Control and Estimation of Multi-Agent Systems," in *European Control Conference*, Linz, Austria, Jul. 2015, pp. 2207–2212.

[79] O. Rozenheck, S. Zhao, and D. Zelazo, "Formation Velocity Tracking with Proportional Control," in *55th Israel Annual Conference on Aerospace Sciences*, Haifa, Israel, Feb. 2015.

[80] S. Zhao and D. Zelazo, "Bearing-Constrained Formation Control Using Bearing Measurements," in *55th Israel Annual Conference on Aerospace Sciences*, Haifa, Israel, Feb. 2015.

[81] D. Zelazo and M. Bürger, "On the Definiteness of the Weighted Laplacian and its Connection to Effective Resistance," in *53rd IEEE Conference on Decision and Control*, Los Angeles, CA, Dec. 2014, pp. 2895–2900.

[82] D. Zelazo, A. Franchi, and P. R. Giordano, "Rigidity Theory in SE(2) for Unscaled Relative Position Estimation Using Only Bearing Measurements," in *European Control Conference*, Strasbourg, France, Jun. 2014, pp. 2703–2708.

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Invited Conference and Workshop Lectures

[121] D. Zelazo, *Passivity theory in cooperative control: A network optimization perspective*, 28th Mediterranean Conference on Control and Automation, Plenary, Saint-Raphaël, France, Jun. 2020.

[122] ——, *Passivity, monotonicity, and network optimization: A new framework for network systems analysis*, SICE International Symposium on Control Systems, Invited Talk, Kumamoto, Japan, Mar. 2019.

[123] ——, *Formation control using bearing-only sensing : Theory and implementation challenges*, IEEE Control Systems Society Kansai Chapter, Invited Talk, Kyoto, Japan, Feb. 2019.

[124] ——, *Formations over directed graphs and local coordinate frames*, 2017 Asian Control Conference Workshop: Advances in distributed control and formation control systems, Invited Talk, Gold Coast, Australia, Dec. 2017.

[125] ——, *Sensor modalities in multi-robot coordination: Constraints and solutions*, SWARM 2017: The 2nd International Symposium on Swarm Behavior and Bio-Inspired Robotics, Keynote Talk, Kyoto, Japan, Nov. 2017.

[126] ——, *Fekete points, formation control, and the balancing problem*, Symposium on Control theory and Power Engineering, IEEE ICSEE, Invited Talk, Eilat, Israel, Nov. 2016.

[127] ——, *Rigidity extensions for bearing-based formation control*, Taxonomies of Interconnected Systems: Partial and Imperfect Information in Multi-Agent Networks, CDC Workshop, Invited Talk, Osaka, Japan, Dec. 2015.

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[129] ——, *Rigidity theory for multi-robot coordination*, IAAC workshop on Motion Control Methods in Robotics, Invited Talk, Herzeliya, Israel, Nov. 2015.

[130] ——, *Uncertain consensus networks: Robustness and its connection to effective resistance*, Control Theory: A Mathematical Perspective on Cyber-Physical Systems, Mathematisches Forschungsinstitut Oberwolfach Workshops, Invited Talk, Oberwolfach, Germany, Feb. 2015.

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[132] ——, *Rigidity theory for multi-robot coordination: Architectural needs and implementation challenges*, Taxonomies of Interconnected Systems: Topology in Distributed Robotics, IROS Workshop, Invited Talk, Chicago, IL, Sep. 2014.

Invited Seminar Talks

[133] D. Zelazo, *Signed nonlinear networks: A passivity and electrical circuit theory approach*, Technion - Israel Institute of Technology, Control & Systems Theory Seminar, Haifa Israel, Jan. 2020.

[134] ——, *Passivity, monotonicity, and network optimization: A new framework for network systems analysis*, Seoul National University, Seoul, Korea, Feb. 2019.

[135] ——, *Graph theory in systems and controls: A tutorial*, Seoul National University, Seoul, Korea, Feb. 2019.

[136] ——, *Signed nonlinear networks: A passivity and electrical circuit theory approach*, Keio University, Tokyo, Japan, Jan. 2019.

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[142] ——, *Fekete points, formation control, and the balancing problem*, Technion - Israel Institute of Technology, Control & Systems Theory Seminar, Haifa, Israel, Jun. 2017.

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[150] ——, *Control and estimation of multi-agent systems with bearing-only sensing: Rigidity theory for se(2)*, Colloquium Technische Kybernetik Seminar Series, University of Stuttgart, Stuttgart, Germany, Jul. 2014.

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[164] ——, *Edge-agreement: Graph-theoretic performance bounds and passivity analysis*, TÜ München, München, Germany, Aug. 2010.

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