

Cameron Nowzari

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RESEARCH INTERESTS	Systems and Control; Robotics; Networked Cyber-Physical Systems; Engineering Cybernetics; Applied Computational Geometry; Event/Self-Triggered Control; Markov Processes; Optimization; Epidemiology; Spreading Processes; Internet of Things	
EXPERIENCE	Assistant Professor George Mason University (Electrical and Computer Engineering)	August 2016 - Present
	Fellow Air Force Research Laboratory (Aerospace Systems Directorate)	Summer 2019
	Lecturer University of Pennsylvania (Electrical and Systems Engineering)	January 2014 - August 2016
	Postdoctoral Research Associate University of Pennsylvania (Electrical and Systems Engineering)	October 2013 - August 2016
EDUCATION	University of California, San Diego , California, USA Ph.D., Engineering Sciences (Mechanical Engineering) M.S., Engineering Sciences (Mechanical Engineering)	September 2013 December 2010
	University of California, Santa Barbara , California, USA B.S., Mechanical Engineering	June 2009
AWARDS AND HONORS	Office of Naval Research Young Investigator Program (YIP) Award International Conference on Data Mining Best Paper Award IEEE Control Systems Magazine - People in Control ACC Best Student Paper Award Finalist (J. Berneburg) Air Force Research Lab Summer Faculty Fellowship IEEE Control Systems Magazine Outstanding Paper Award UCSD Outstanding Graduate Student Award Achievement Rewards for College Scientists (ARCS) Award O. Hugo Schuck Best Paper Award for Theory American Control Conference Best Student Paper Award Finalist California Space Grant Consortium Graduate Fellowship Jacobs School of Engineering Alumni Fellowship	May 2021 Nov. 2019 Aug. 2019 July 2019 June 2019 Dec. 2018 June 2013 Sept. 2012-June 2013 June 2012 June 2011 Sept. 2009-June 2010 Sept. 2009-June 2011

**SPONSORED
RESEARCH****Active**

[G-6] PI of ONR YIP: 07/01/21 - 06/30-24, \$510,000
The Cycle of Emergence: Structure, Agency, and the Environment

[G-5] PI of NSF EPCN 2028523: 05/15/20 - 04/30-21, \$150,000
RAPID: Networked Compartmental Modeling and Analysis for Spread of COVID-19

[G-4] PI of ONR Code 34 N00014-20-1-2507: 05/01/20 - 04/30/23, \$751,667
Deployment of a Full-Scale Lighter-Than-Air (LTA) Swarm System

[G-3] PI of ONR Code 34 N00014-20-1-2042: 01/21/20 - 07/04-22, \$275,769
Provably Correct Stigmergic Controllers for Enabling Emergent Behaviors in Swarms

Expired

[G-2] PI of ONR Code 30 N00014-19-1-2121: 04/01/19 - 06/30/20, \$110,025
Enabling Emergent Behaviors in Unmanned Robotic Systems

[G-1] Co-PI of NSF CNS-1737989: 04/01/17 - 03/31/19, \$99,999
EAGER: SC2: Efficient, Collaborative Spectrum Sharing through a Systems and Optimal Control Approach

**JOURNAL
PUBLICATIONS**

[J-17] C. Taylor and **C. Nowzari**. The impact of catastrophic collisions and collision avoidance on a swarming behavior. *Robotics and Autonomous Systems*. To appear

[J-16] S. M. P. Dinkarrao, X. Guo, H. Sayadi, **C. Nowzari**, A. Sasan, S. Rafatirad, L. Zhao and H. Homayoun. Scalable technique for securing IoT networks against malware epidemics. *IEEE Access* 8 (2), 2020, pp. 138508-138528

[J-15] D. Tabatabai, M. Ajina, and **C. Nowzari**. Self-triggered distributed k -order coverage control. *IEEE Transactions on Control of Network Systems*. To appear

[J-14] J. Berneburg and **C. Nowzari**. Robust dynamic event-triggered coordination of multi-agent systems with a designable minimum inter-event time. *IEEE Transactions on Automatic Control*. To appear

[J-13] M. Ajina, D. Tabatabai, and **C. Nowzari**. Distributed event-triggered broadcasting and control for multi-agent optimal deployment. *IEEE Transactions on Cybernetics*. To appear

[J-12] P. Xu, **C. Nowzari**, and Z. Tian. A class of distributed event-triggered average consensus algorithms for multi-agent systems. *International Journal of Nonlinear Control*. To appear

[J-11] S. Bowman, **C. Nowzari**, and G. J. Pappas. Consensus of multi-agent systems via asynchronous cloud communication. *IEEE Transactions on Control of Network Systems* 7 (2), 2019, pp. 627-637

[J-10] **C. Nowzari**, E. Garcia, and J. Cortés. Event-triggered communication and control of networked systems for multi-agent consensus. *Automatica* 105, 2019, pp. 1-27

[J-9] N. J. Watkins, **C. Nowzari**, and G. J. Pappas. Robust economic Model Predictive Control of continuous-time epidemic processes. *IEEE Transactions on Automatic Control* 63 (3), 2020, pp. 1116-1131

[J-8] N. J. Watkins, **C. Nowzari**, V. M. Preciado, and G. J. Pappas. Optimal resource allocation for competitive spreading processes on bilayer networks. *IEEE Transactions on Control of Network Systems* 5 (1), 2018, pp. 298-307

[J-7] **C. Nowzari**, V. M. Preciado, and G. J. Pappas. Analysis and control of epidemics: a survey of spreading processes on complex networks. *IEEE Control Systems Magazine* 36 (1), 2016, pp. 26-46

2018 IEEE Control Systems Magazine Outstanding Paper Award

[J-6] **C. Nowzari**, V. M. Preciado, and G. J. Pappas. Optimal resource allocation for control of networked epidemic models. *IEEE Transactions on Control of Network Systems* 4 (2), 2017, pp. 159-169

[J-5] S. Han, V. M. Preciado, **C. Nowzari**, and G. J. Pappas. Data-driven network resource allocation for controlling spreading processes. *IEEE Transactions on Network Science and Engineering* 2 (4), 2015, pp. 127-138

[J-4] **C. Nowzari** and J. Cortés. Distributed event-triggered coordination for average consensus on weight-balanced digraphs. *Automatica* 68, 2016, pp. 237-244

[J-3] **C. Nowzari** and J. Cortés. Team-triggered coordination for real-time control of networked cyber-physical systems. *IEEE Transactions on Automatic Control* 61 (1), 2016, pp. 34-47

[J-2] **C. Nowzari** and J. Cortés. Self-triggered optimal servicing in dynamic environments with acyclic structure. *IEEE Transactions on Automatic Control* 58 (5), 2013, pp. 1236-1249

[J-1] **C. Nowzari** and J. Cortés. Self-triggered coordination of robotic networks for optimal deployment. *Automatica* 48 (6), 2012, pp. 1077-1087

BOOK CHAPTERS

[BC-4] **C. Nowzari**, J. Cortés, and G. J. Pappas. Event-triggered control for multi-agent average consensus. *Cooperative Control of Multi-agent Systems: Theory and Applications*, Wiley, 2017, pp. 177-208

[BC-3] V. M. Preciado, M. Zargham, **C. Nowzari**, S. Han, M. Ogura and G. J. Pappas. Bio-inspired framework for allocation of protection resources in cyber-physical networks. *Principles of Cyber-Physical Systems*, Cambridge University Press, 2020, pp. 293-324

[BC-2] **C. Nowzari** and J. Cortés. Self-triggered and team-triggered control of networked cyber-physical systems. *Event-Based Control and Signal Processing, Series in Embedded Systems*, CRC Press, 2015, pp. 203-220

[BC-1] **C. Nowzari** and J. Cortés. Robust team-triggered coordination of networked cyberphysical systems. *Lecture Notes in Control and Information Sciences*, vol. 449, Springer-Verlag, 2013, pp. 317-336

CONFERENCE PROCEEDINGS

[C-31] M. Mubarak, J. Berneburg, and **C. Nowzari**. Stochastic vs. Deterministic Modeling for the Spread of COVID-19 in Small Networks. *Proceeding of the American Control Conference*, New Orleans, Louisiana. To appear

[C-30] C. Taylor, A. Siebold, and **C. Nowzari**. On the Effects of Minimally Invasive Collision Avoidance on an Emergent Behavior. *Twelfth International Conference on Swarm Intelligence*, Barcelona, Spain, 2020, pp. 324-332

[C-29] J. Berneburg, E. Garcia, A. Gerlach, D. Casbeer, and **C. Nowzari**. Strongly Non-Zeno Event-Triggered Wireless Clock Synchronization. *Proceedings of the IFAC World Congress*, Berlin, Germany, 2020, pp. 2787-2792

[C-28] C. Taylor, C. Luzzi, and **C. Nowzari**. On the Effects of Collision Avoidance on Emergent Swarm Behavior. *Proceedings of the American Control Conference*, Denver,

Colorado, 2020, pp. 931-936

[C-27] J. Berneburg and **C. Nowzari**. Distributed dynamic event-triggered algorithms with positive minimum inter-event times on weight-balanced digraphs. Proceedings of the IEEE Conference on Decision and Control, Nice, France, 2019, pp. 2598-2603

[C-26] X. Guo, L. Zhao, **C. Nowzari**, S. Rafatirad, H. Homayoun and S. M. P. Dinakarrao. Deep multi-attributed graph translation with node-edge co-evolution. Proceedings of the IEEE International Conference on Data Mining, Beijing, China, 2019, pp. 250-259

2019 ICDM Best Paper Award

[C-25] J. Berneburg and **C. Nowzari**. Distributed dynamic event-triggered coordination with a designable minimum inter-event time. Proceedings of the American Control Conference, Philadelphia, Pennsylvania, 2019, pp. 1424-1429

2019 ACC Best Student Paper Award Finalist

[C-24] D. Tabatabai and **C. Nowzari**. Higher order optimal deployment with self-triggered coordination. Proceeding of the American Control Conference, Philadelphia, Pennsylvania, 2019, pp. 2710-2715

[C-23] S. M. P. Dinakarrao, H. Sayedi, H. M. Makrani, **C. Nowzari**, S. Rafatirad, and H. Homayoun. Lightweight node-level malware detection and network-level malware confinement in IoT networks. Proceedings of Design, Automation, and Test, Florence, Italy, 2019, pp. 776-781

[C-22] N. J. Watkins, **C. Nowzari**, and G. J. Pappas. A robust moment closure for general continuous-time epidemic processes. Proceedings of the IEEE Conference on Decision and Control, Miami, Florida, 2018, pp. 244-249

[C-21] P. Xu, **C. Nowzari**, and Z. Tian. A class of event-triggered coordination algorithms for multi-agent systems on weight-balanced digraphs. Proceedings of the American Control Conference, Milwaukee, Wisconsin, 2018, pp. 5988-5993

[C-20] M. Ajina and **C. Nowzari**. An event-triggered virtual force algorithm for multi-agent coverage control with obstacles. Proceedings of the American Control Conference, Milwaukee, Wisconsin, 2018, pp. 1009-1014

[C-19] **C. Nowzari**. Multi-agent coordination via a shared wireless spectrum. Proceedings of the IEEE Conference on Decision and Control, Melbourne, Australia, 2017, pp. 6714-6719

[C-18] N. J. Watkins, K. Gatsis, **C. Nowzari**, and G. J. Pappas. Battery management for control systems with energy harvesting sensors. Proceedings of the IEEE Conference on Decision and Control, Melbourne, Australia, 2017, pp. 4538-4543

[C-17] Y. Liu, **C. Nowzari**, Z. Tian, and Q. Ling. Asynchronous periodic event-triggered coordination of multi-agent systems. Proceedings of the IEEE Conference on Decision and Control, Melbourne, Australia, 2017, pp. 6696-6701

[C-16] N. J. Watkins, **C. Nowzari**, and G. J. Pappas. Inference, prediction, and control of networked epidemics. Proceedings of the American Control Conference, Seattle, Washington, 2017, pp. 5611-5616

[C-15] S. L. Bowman, **C. Nowzari**, and G. J. Pappas. Coordination of multi-agent systems via asynchronous cloud communication. Proceeding of the IEEE Conference on Decision and Control, Las Vegas, Nevada, 2016, pp. 2215-2220

[C-14] M. Fazlyab, **C. Nowzari**, G. J. Pappas, A. Ribeiro, and V. M. Preciado. Self-triggered time-varying convex optimization. Proceeding of the IEEE Conference on

Decision and Control, Las Vegas, Nevada, 2016, pp. 3090-3097

[C-13] N. Bezzo, K. Mohta, **C. Nowzari**, I. Lee, V. Kumar, and G. J. Pappas. Online planning for energy-efficient and disturbance-aware UAV operations. Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems, Daejeon, Korea, 2016, pp. 5027-5033

[C-12] **C. Nowzari** and G. J. Pappas. Multi-agent coordination with asynchronous cloud access. Proceedings of the American Control Conference, Boston, Massachusetts, 2016, pp. 4649-4654

[C-11] **C. Nowzari**, M. Ogura, V. M. Preciado, and G. J. Pappas. Optimal resource allocation for containing epidemics on time-varying networks. Proceedings of the Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, California, 2015, pp. 1333-1337

[C-10] **C. Nowzari**, M. Ogura, V. M. Preciado, and G. J. Pappas. A general class of spreading processes with non-Markovian dynamics. Proceedings of the IEEE Conference on Decision and Control, Osaka, Japan, 2015, pp. 5073-5078

[C-9] S. A. Aleem, **C. Nowzari**, and G. J. Pappas. Self-triggered pursuit of a single evader. Proceedings of the IEEE Conference on Decision and Control, Osaka, Japan, 2015, pp. 1433-1440

[C-8] X. Meng, L. Xie, Y. C. Soh, **C. Nowzari**, and G. J. Pappas. Periodic event-triggered average consensus over directed graphs. Proceedings of the IEEE Conference on Decision and Control, Osaka, Japan, 2015, pp. 4151-4156

[C-7] **C. Nowzari**, J. Cortés, and G. J. Pappas. Team-triggered coordination of robotic networks for optimal deployment. Proceedings of the American Control Conference, Chicago, Illinois, 2015, pp. 5744-5751

[C-6] N. J. Watkins, **C. Nowzari**, V. M. Preciado, and G. J. Pappas. Optimal resource allocation for competing epidemics over arbitrary networks. Proceedings of the American Control Conference, Chicago, Illinois, 2015, pp. 1381-1386

[C-5] **C. Nowzari**, V. M. Preciado, and G. J. Pappas. Stability analysis of generalized epidemic models over directed networks. Proceedings of the IEEE Conference on Decision and Control, Los Angeles, California, 2014, pp. 6197-6202

[C-4] **C. Nowzari** and J. Cortés. Zeno-free, distributed event-triggered communication and control for multi-agent average consensus. Proceedings of the American Control Conference, Portland, Oregon, 2014, pp. 2148-2153

[C-3] **C. Nowzari** and J. Cortés. Team-triggered coordination of networked systems. Proceedings of the American Control Conference, Washington, D.C. 2013, pp. 3827-3832

[C-2] **C. Nowzari** and J. Cortés. Robust optimal decision policies for servicing targets in acyclic digraphs. Proceedings of the IEEE Conference on Decision and Control, Maui, Hawaii, 2012, pp. 136-141

[C-1] **C. Nowzari** and J. Cortés. Self-triggered coordination of robotic networks for optimal deployment. Proceedings of the American Control Conference, San Francisco, California, 2011, pp. 1039-1044

2011 ACC Best Student Paper Award Finalist

2012 O. Hugo Schuck Best Paper Award