Dimitra Panagou

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Education

Ph.D. in Mechanical Engineering, National Technical University of Athens, Greece, 2012.

Diploma in Mechanical Engineering, National Technical University of Athens, Greece, 2006.

Experience

University of Michigan, Ann Arbor
Department of Robotics and Department of Aerospace Engineering
Associate Professor, July 2022–present.

University of Michigan, Ann Arbor, Department of Aerospace Engineering
Associate Professor, September 2020–June 2022.

University of Michigan, Ann Arbor, Department of Aerospace Engineering
Assistant Professor, September 2014–August 2020.

University of Illinois, Urbana-Champaign, Coordinated Science Laboratory
Postdoctoral Research Associate, August 2012–August 2014.

University of Pennsylvania, GRASP Lab
Visiting Research Scholar, June 2013 and September 2010–December 2010.

University of Delaware, Mechanical Engineering Department
Visiting Research Scholar, March 2009–June 2009.

Fields of Research Interest

Nonlinear Systems, Control and Estimation; Multi-Agent Systems; Decentralized/Distributed Planning and Control; Cooperative and Non-cooperative Control; Switched and Hybrid Systems; Robotics; Motion and Path Planning; Guidance, Navigation and Control of Unmanned Vehicles; Applications in Autonomous Multi-Vehicle Systems, Human-Robot Interaction, and Robotic Networks (Safety and Resilience).

Research

Under Review Journal Publications

40. M. Black and D. Panagou, "Consolidated Control Barrier Functions: Synthesis and Online Verification via Adaptation under Input Constraints", *under review*

39. M. Black and D. Panagou, "Fixed-Time Parameter Adaptation for Safe Control Synthesis", *under review*

38. V. S. Chipade and D. Panagou, "IDCAIS: Inter-Defender Collision-Aware Interception Strategy against Multiple Attackers", *under revision*

Peer-Reviewed Journal Publications

37. V. S. Chipade and D. Panagou, "Aerial Swarm Defense using Interception and Herding Strategies", *IEEE Transactions on Robotics, accepted, to appear*

36. J. Breeden and D. Panagou, "Safety-Critical Control for Systems with Impulsive Actuators and Dwell Time Constraints", *IEEE Control Systems Letters (L-CSS), accepted, to appear*

35. J. Breeden and D. Panagou, "Autonomous Spacecraft Attitude Reorientation Using Robust Sampled-Data Control Barrier Functions", *AIAA Journal of Guidance, Control and Dynamics, accepted (April 2023), to appear*

34. J. Breeden and D. Panagou, "Robust Control Barrier Functions under High Relative Degree and Input Constraints for Satellite Trajectories", *Automatica, accepted (April 2023), to appear*

33. D. R. Agrawal and D. Panagou, "Safe and Robust Observer-Controller Synthesis Using Control Barrier Functions", *IEEE Control Systems Letters (L-CSS), vol. 7, pp. 127-132, 2023*

32. A. Mustafa and D. Panagou, "Adversary Detection and Resilient Control for Multi-Agent Systems", *IEEE Transactions on Control of Network Systems, doi: 10.1109/TCNS.2022.3203350, 2022*

31. E. Arabi and D. Panagou, "Adaptive Control of Second-Order Safety-Critical Multi-Agent Systems with Nonlinear Dynamics", *IEEE Transactions on Control of Network Systems, vol. 9, no. 4, pp. 1911-1922, December 2022*

30. W. Bentz, L. Qian and D. Panagou, "Online Learning of Assistive Dynamic Camera Views by an Aerial Co-robot in Augmented Reality Multitasking Environments", *Autonomous Robots, vol. 46, pp. 949–970, August 2022*

29. K. Garg, E. Arabi and D. Panagou, "Fixed-time Control under Spatiotemporal and Input Constraints: A QP-based Approach", *Automatica, vol. 141, 110314, July 2022*

28. J. Breeden and D. Panagou, "Guaranteed Safe Spacecraft Docking with Control Barrier Functions", *IEEE Control Systems Letters (L-CSS), vol. 6, pp. 2000-2005, 2022*

27. D. R. Agrawal, H. Parwana, R. Cosner, U. Rosolia, A. D. Ames and D. Panagou, "A Constructive Method for Designing Safe Multirate Controllers for Differentially-Flat Systems", *IEEE Control Systems Letters (L-CSS), vol. 6, pp. 2138-2143, 2022*

26. J. Usevitch and D. Panagou, "Adversarial Resilience for Sampled-Data Systems under High-Relative-Degree Safety Constraints", *IEEE Transactions on Automatic Control, doi: 10.1109/TAC.2022.3157791, March 2022*

25. J. Usevitch and D. Panagou, "Resilient Trajectory Propagation in Multi-Robot Networks", *IEEE Transactions on Robotics, vol. 38, no. 2, pp. 42-56, February 2022*

24. K. Garg, R. Cosner, U. Rosolia, A. D. Ames and D. Panagou, "Multi-rate Control Design under Input Constraints via Fixed-Time Barrier Functions", *IEEE Control Systems Letters (L-CSS), vol. 6, pp. 608-613, 2022*

23. J. Breeden, K. Garg and D. Panagou, "Control Barrier Functions in Sampled-Data Systems", *IEEE Control Systems Letters (L-CSS), vol. 6, pp. 367-372, 2022*

22. V. S. Chipade and D. Panagou, "Multi-Agent Planning and Control for Swarm Herding in 2D Obstacle Environments under Bounded Inputs", *IEEE Transactions on Robotics, vol. 37, no. 6, pp. 1956-1972, December 2021*

21. M. Baranwal, K. Garg, D. Panagou and A. O. Hero, "Robust Distributed Fixed-Time Economic Dispatch under Time-Varying Topology", *IEEE Control Systems Letters (L-CSS), vol. 5, no. 4, pp. 1183-1188, October 2021*

20. K. Garg and D. Panagou, "Finite-Time Stability of Hybrid Systems with Unstable Modes", *Frontiers in Control Engineering: Nonlinear Control, vol. 2, pp 1-8, August 2021*

19. K. Garg and D. Panagou, "Fixed-time Stable Gradient-flow Schemes: Applications to Continuous-time Optimization", *IEEE Transactions on Automatic Control, vol. 66, no. 5, pp. 2002-2015, May 2021*

18. V. S. Chipade, V. S. A. Marella and D. Panagou, "Aerial Swarm Defense by StringNet Herding: Theory and Experiments", *Frontiers in Robotics and AI: Multi-Robot Systems, vol. 8, 640446, pp. 1-18, April 2021.*

17. D. Panagou, M. Turpin and V. Kumar, "Decentralized Goal Assignment and Safe Trajectory Generation in Multi-Robot Networks via Multiple Lyapunov Functions", *IEEE Transactions on Automatic Control, vol. 65, no. 8, pp. 3365-3380, August 2020*

16. J. Usevitch and D. Panagou, "Resilient Leader-Follower Consensus to Arbitrary Reference Values in Time-Varying Graphs", *IEEE Transactions on Automatic Control, vol. 65, no. 4, pp. 1755-1762, April 2020*

15. J. Usevitch and D. Panagou, "Determining r- and (r,s)-Robustness of Digraphs Using Mixed Integer Linear Programming", *Automatica, vol. 111, 108586, pp. 1-13, January 2020*

14. W. Bentz and D. Panagou, "A Hybrid Approach to Persistent Coverage in Stochastic Environments", *Automatica, vol. 109, 108554, pp. 1-12, November 2019*

13. D. Han and D. Panagou, "Robust multi-task formation control via parametric Lyapunov-like Barrier Functions", *IEEE Transactions on Automatic Control, vol. 64, no. 11, pp. 4439-4453, November 2019*

12. K. Garg and D. Panagou, "Finite-time multi-agent estimation and control for multi-aircraft systems under wind and dynamic obstacles", *AIAA Journal of Guidance, Control and Dynamics, vol. 42, no. 7, pp. 1489-1505, July 2019*

11. H. Rastgoftar, E. M. Atkins and D. Panagou, "Safe multi-quadcopter system continuum deformation over moving frames", *IEEE Transactions on Control of Network Systems, vol. 6, no. 2, pp. 737-749, June 2019*

10. X. Ma, Z. Jiao, Z. Wang and D. Panagou, "3D decentralized prioritized motion planning and coordination for high-density operations of micro aerial vehicles", *IEEE Transactions on Control Systems Technology, vol. 26, no. 3, pp. 939-953, May 2018*

9. W. Bentz, T. Hoang, E. Bayasgalan and D. Panagou, "Complete 3-D dynamic coverage in energy-constrained multi-UAV sensor networks", *Autonomous Robots, vol. 42, no. 4, pp. 825-851, April 2018*

8. D. Panagou, D. M. Stipanović and P. G. Voulgaris, "Dynamic coverage and avoidance control under anisotropic sensing", *IEEE Transactions on Control of Network Systems, vol. 4, no. 4, pp. 850-862, December 2017*

7. D. Panagou, "A distributed feedback motion planning protocol for multiple unicycle agents of different classes", *IEEE Transactions on Automatic Control, vol. 62, no. 3, pp. 1178-1193, March 2017*

6. D. Panagou, D. M. Stipanović and P. G. Voulgaris, "Distributed coordination and control for multi-robot networks using Lyapunov-like barrier functions", *IEEE Transactions on Automatic Control, vol. 61, no. 3, pp. 617-632, March 2016*

5. D. Panagou, H. G. Tanner and K. J. Kyriakopoulos, "Control design for a class of nonholonomic systems via reference vector fields and output regulation", *ASME Journal of Dynamic Systems, Measurement and Control, 137 (8), pp. 1-9, August 2015*

4. D. Panagou, D. M. Stipanović and P. G. Voulgaris, "Dynamic coverage control in unicycle multi-robot networks under anisotropic sensing", *Frontiers in Robotics and AI: Multi-Robot Systems, vol. 2, March 2015, pp. 1-17*

3. D. Panagou and V. Kumar, "Cooperative visibility maintenance for Leader - Follower formations in obstacle environments", *IEEE Transactions on Robotics, vol. 30, no. 4, pp. 831-844, August 2014*

2. D. Panagou and K. J. Kyriakopoulos, "Dynamic Positioning for an Underactuated Marine Vehicle using Hybrid Control", *International Journal on Control, vol. 87, no. 2, pp. 264-280, September 2013*

1. D. Panagou and K. J. Kyriakopoulos, "Viability control for a class of underactuated systems", *Automatica, 49 (2013), pp. 17-29*

Under Review Conference Publications

4. D. Agrawal, R. Chen and D. Panagou, "Gatekeeper: Safety Critical Control of Nonlinear Systems with Limited Perception in Unknown and Dynamic Environments", *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems, Detroit, MI, October 2023*

3. A. Gilbert and D. Panagou, "Multi-Robot Dynamic-Obstacle-Aware Task Assignment and Trajectory Planning", *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems, Detroit, MI, October 2023*

2. H. Parwana and D. Panagou, "FORESEE: Model-based Reinforcement Learning using Unscented Transform with application to Tuning of Control Barrier Functions", *Robotics: Science and Systems, Daegu, Republic of Korea, July 2023*

Peer-Reviewed Conference Publications

80. V. S. Chipade, A. Gilbert, D. Harari and D. Panagou, "Collaborative Control of Aerial Robots for Inferring Human Intent from Gaze Following", *Bridgetown, Barbados, August 2023*

79. M. Black and D. Panagou, "Safe Control Design for Unknown Nonlinear Systems with Koopman-based Fixed-Time Identification", *2023 IFAC World Congress, Yokohama, Japan, July 2023*

78. M. Black, M. Jankovic, A. Sharma and D. Panagou, "Future-Focused Control Barrier Functions for Autonomous Vehicle Control", *2023 American Control Conference, San Diego, CA, June 2023*

77. J. Breeden and D. Panagou, "Compositions of Multiple Control Barrier Functions Under Input Constraints", *2023 American Control Conference, San Diego, CA, June 2023*

76. M. Black, G. Fainekos, B. Hoxha, D. Prokhorov and D. Panagou, "Safety Under Uncertainty: Tight Bounds with Risk-Bounded Control Barrier Functions", *2023 IEEE International Conference on Robotics and Automation, London, United Kindom, May 2023*

75. H. Parwana and D. Panagou, "Trust-based Rate-Tunable Control Barrier Functions for Non-Cooperative Multi-Agent Systems", *61st IEEE Conference on Decision and Control, Cancun, Mexico, December 2022*

74. J. Breeden and D. Panagou, "Predictive Control Barrier Functions for Online Safety Critical Control", *61st IEEE Conference on Decision and Control, Cancun, Mexico, December 2022*

73. H. Parwana and D. Panagou, "Recursive Feasibility-Guided Optimal Parameter Adaptation of Differential Convex Optimization Policies for Safety-Critical Systems", *2022 IEEE International Conference on Robotics and Automation, Philadelphia, PA, May 2022*

72. A. L. Gilbert, V. S. Chipade and D. Panagou, "Robust Leader-Follower Formation Control for Human-Robot Scenarios", *2022 American Control Conference, Atlanta, Georgia, June 2022*

71. B. Haydon, K. Mishra, P. Keyantuo, D. Panagou, F. Katopodes Chow, S. Moura and C. Vermillion, "Dynamic Coverage Meets Regret: Unifying Two Control Performance Measures for Mobile Agents in Spatiotemporally Varying Environments ", *60th IEEE Conference on Decision on Control, Austin, Texas, December 2021*

70. K. Garg and D. Panagou, "Finite-Time Stabilization of Switched Systems with Unstable Modes", *60th IEEE Conference on Decision on Control, Austin, Texas, December 2021*

69. J. Breeden and D. Panagou, "High Relative Degree Control Barrier Functions with Input Constraints", *60th IEEE Conference on Decision on Control, Austin, Texas, December 2021*

68. D. R. Agrawal and D. Panagou, "Safe Control Synthesis via Input Constrained Control Barrier Functions", *60th IEEE Conference on Decision on Control, Austin, Texas, December 2021*

67. M. Black, E. Arabi and D. Panagou, "A Fixed-Time Stable Adaptation Law for Safety-Critical Control under Parametric Uncertainty", *2021 European Control Conference, Rotterdam, Netherlands, July 2021*

66. J. Usevitch and D. Panagou, "Adversarially Resilient Control Barrier Functions in Sampled-Data Systems", *2021 American Control Conference, New Orleans, Louisiana, May 2021*

65. E. Arabi, D. Panagou and T. Yucelen, "Adaptive Active-Passive Networked Multiagent Systems", *2021 American Control Conference, New Orleans, Louisiana, May 2021*

64. K. Garg and D. Panagou, "Characterization of Domain of Fixed-time Stability under Control Input Constraints", *2021 American Control Conference, New Orleans, Louisiana, May 2021*

63. K. Garg and D. Panagou, "Robust Control Barrier and Control Lyapunov Functions with Fixed-Time Convergence Guarantees", *2021 American Control Conference, New Orleans, Louisiana, May 2021*

62. W. Zhang, V. S. Chipade and D. Panagou, "Herding an Adversarial Swarm in Three-dimensional Spaces", *2021 American Control Conference, New Orleans, Louisiana, May 2021*

61. V. S. Chipade and D. Panagou, "Multi-Swarm Herding: Protecting against Adversarial Swarms", *59th IEEE Conference on Decision on Control, Jeju Island, Republic of Korea, December 2020*

60. K. Garg, M. Baranwal and D. Panagou, "A Fixed-Time Convergent Distributed Algorithm for Strongly Convex Function in a Time-Varying Network", *59th IEEE Conference on Decision on Control, Jeju Island, Republic of Korea, December 2020*

59. J. Breeden and D. Panagou, "Quadratic Programs for High Relative Degree Spatial Constraints and Spatiotemporal Specifications with Spacecraft Applications", *59th IEEE Conference on Decision on Control, Jeju Island, Republic of Korea, December 2020*

58. M. Black, K. Garg and D. Panagou, "QP-based Control Synthesis under Spatiotemporal Constraints and Non-vanishing Disturbances", *59th IEEE Conference on Decision on Control, Jeju Island, Republic of Korea, December 2020*

57. J. Usevitch, K. Garg and D. Panagou, "Strong Invariance using Control Barrier Functions: A Clarke Tangent Cone Approach", *59th IEEE Conference on Decision on Control, Jeju Island, Republic of Korea, December 2020*

56. M. Radmanesh, Z. Wang, V. S. Chipade, G. Tsechpenakis and D. Panagou, "LIV-LAM: LiDAR and Visual Localization and Mapping", *2020 American Control Conference, Denver, CO, July 2020*

55. J. Usevitch and D. Panagou, "Resilient Finite-Time Consensus: A Discontinuous Systems Perspective", *2020 American Control Conference, Denver, CO, July 2020*

54. E. Arabi, K. Garg and D. Panagou, "Safety-Critical Adaptive Control with Nonlinear Reference Model Systems", *2020 American Control Conference, Denver, CO, July 2020*

53. K. Garg, E. Arabi and D. Panagou, "Prescribed-time convergence with input constraints: A control Lyapunov function based approach", *2020 American Control Conference, Denver, CO, July 2020*

52. E. Arabi, D. Panagou, T. Yucelen and N. Nguyen, "Model Reference Adaptive Control of Uncertain Dynamical Systems Subject to High-Order Actuator Dynamics with Performance Guarantees", *2020 AIAA SciTech Forum, Orlando, FL, January 2020*

51. K. Garg and D. Panagou, "Control-Lyapunov and Control-Barrier Functions based Quadratic Program for Spatio-temporal Specifications", *58th IEEE Conference on Decision on Control, Nice, France, December 2019*

50. V. S. Chipade and D. Panagou, "Herding an Adversarial Swarm in an Obstacle Environment", *58th IEEE Conference on Decision on Control, Nice, France, December 2019*

49. J. Usevitch and D. Panagou, "Resilient Leader-Follower Consensus with Time-Varying Leaders in Discrete-Time Systems", *58th IEEE Conference on Decision on Control, Nice, France, December 2019*

48. L. Huang and D. Panagou, "A Predictive Vector Field-based Lane-Changing Controller", *58th IEEE Conference on Decision on Control, Nice, France, December 2019*

47. Y. E. Sahin, Z. Liu, K. Rutledge, D. Panagou, S. Z. Yong and N. Ozay, "Intention-Aware Supervisory Control with Driving Safety Applications", *2019 IEEE Conference on Control Technology and Applications, Hong Kong, China, August 2019*

46. V. S. Chipade and D. Panagou, "Herding an Adversarial Attacker to a Safe Area for Defending Safety-Critical Infrastructure", *2019 American Control Conference, Philadelphia, PA, July 2019*

45. J. Usevitch and D. Panagou, "Determining r-Robustness of Arbitrary Digraphs Using Zero-One Linear Integer Programming", *2019 American Control Conference, Philadelphia, PA, July 2019*

44. P. Bobade, D. Panagou and A. Kurdila, "Multi-Agent Adaptive Estimation with Consensus in Reproducing Kernel Hilbert Spaces", *2019 European Control Conference, Naples, Italy, June 2019*

43. V. S. Chipade, Q. Shen, L. Huang, N. Ozay, S. Z. Yong and D. Panagou, "Safe Autonomous Overtaking with Intention Estimation", *2019 European Control Conference, Naples, Italy, June 2019*

42. W. Bentz, S. Dhanjal and D. Panagou, "Unsupervised Learning of Assistive Camera Views by an Aerial Co-robot in Augmented Reality Multitasking Environments", *2019 IEEE International Conference on Robotics and Automation, Montreal, Canada, May 2019*

41. V. S. Chipade and D. Panagou, "Multiplayer Target-Attacker-Defender Differential Game: Pairing Allocations and Control Strategies for Guaranteed Intercept", *2019 AIAA Science and Technology Forum and Exposition (Scitech) Forum, San Diego, CA, January 2019*

40. K. Garg and D. Panagou, "Hybrid Planning and Control for Multiple Fixed-Wing Aircraft under Input Constraints", *2019 AIAA Science and Technology Forum and Exposition (Scitech) Forum, San Diego, CA, January 2019. Best Student Paper Finalist.*

39. J. Usevitch, K. Garg and D. Panagou, "Finite-Time Resilient Formation Control with Bounded Inputs", *57th IEEE Conference on Decision on Control, Miami, FL, December 2018*

38. L. Huang and D. Panagou, "Hierarchical Design of Highway Merging Controller using Navigation Vector Fields under Bounded Sensing Uncertainty", *2018 Int. Symposium on Distributed Autonomous Robotic Systems (DARS), University of Colorado Boulder, October 2018*

37. W. Bentz and D. Panagou, "Bayesian-inferred Flexible Path Generation in Human-Robot Collaborative Networks", *2018 International Conference on Intelligent Robots and Systems, Madrid, Spain, October 2018*

36. J. Usevitch and D. Panagou, "Resilient Leader-Follower Consensus to Arbitrary Reference Values", *2018 American Control Conference, Milwaukee, Wisconsin, June 2018*

35. K. Garg and D. Panagou "New Results on Finite-Time Stability: Geometric Conditions and Finite-Time Controllers", *2018 American Control Conference, Milwaukee, Wisconsin, June 2018*

34. W. Bentz and D. Panagou, "Energy-aware Persistent Coverage and Intruder Interception in 3D Dynamic Environments", *2018 American Control Conference, Milwaukee, Wisconsin, June 2018*

33. D. Han, L. Huang and D. Panagou "Approximating the Region of Multi-Task Coordination via the Optimal Lyapunov-Like Barrier Function" *2018 American Control Conference, Milwaukee, Wisconsin, June 2018*

32. K. Garg and D. Panagou, "A Robust Coordination Protocol for Safe Multi-Agent Motion Planning", *2018 AIAA Guidance, Navigation, and Control Conference, Kissimmee, Florida, January 2018*

31. J. Usevitch and D. Panagou, "r-Robustness and (r,s)-Robustness of Circulant Graphs", *56th IEEE Conference on Decision and Control, Melbourne, Australia, December 2017*

30. D. Han and D. Panagou, "Distributed Multi-task Formation Control under Parametric Communication Uncertainties", *56th IEEE Conference on Decision and Control, Melbourne, Australia, December 2017*

29. D. Han and D. Panagou, "Chebyshev Approximation and Higher Order Derivatives of Lyapunov Functions for Estimating the Domain of Attraction", *56th IEEE Conference on Decision and Control, Melbourne, Australia, December 2017*

28. K. Garg, D. Han and D. Panagou, "Robust Semi-Cooperative Multi-Agent Coordination in the Presence of Stochastic Disturbances", *56th IEEE Conference on Decision and Control, Melbourne, Australia, December 2017*

27. W. Bentz and D. Panagou, "Persistent Coverage of a Two-dimensional Manifold Subject to Time-varying Disturbances", *56th IEEE Conference on Decision and Control, Melbourne, Australia, December 2017*

26. M. Coon and D. Panagou, "Control Strategies for Multiplayer Target-Attacker-Defender Differential Games with Double Integrator Dynamics", *56th IEEE Conference on Decision and Control, Melbourne, Australia, December 2017*

25. W. Bentz and D. Panagou, "3D Dynamic Coverage and Avoidance Control in Power-constrained Networks", *2017 International Conference on Unmanned Aircraft Systems, Miami, FL, USA, June 2017*

24. M. Sutorius and D. Panagou, "Decentralized Hybrid Control for Multi-Agent Motion Planning and Coordination in Polygonal Environments", *20th IFAC World Congress, Toulouse, France, July 2017*

23. L. Huang and D. Panagou, "Automated Turning and Merging for Autonomous Vehicles using a Nonlinear Model Predictive Control Approach", *2017 American Control Conference, Seattle, WA, USA, May 2017*

22. T. Hoang, E. Bayasgalan, Z. Wang, G. Tsechpenakis and D. Panagou, "Vision-Based Target Tracking and Autonomous Landing of a Quadrotor on a Ground Vehicle", *2017 American Control Conference, Seattle, WA, USA, May 2017.*

21. W. Bentz and D. Panagou, "An Energy-aware Redistribution Method for Multi-Agent Dynamic Coverage Networks", *55th IEEE Conference on Decision and Control, Las Vegas, USA, December 2016*

20. X. Ma, Z. Jiao, Z. Wang and D. Panagou, "Decentralized Prioritized Motion Planning for Multiple Autonomous UAVs in 3D Polygonal Obstacle Environments", *2016 International Conference on Unmanned Aircraft Systems, Arlington, VA, USA, June 2016*

19. R. Hegde and D. Panagou, "Multi-Agent Motion Planning and Coordination in Polygonal Environments using Vector Fields and Model Predictive Control", *2016 European Control Conference, Aalborg, Denmark, July 2016*

18. W. Ding, M. R. Ganesh, J. J. Corso and D. Panagou, "Real-Time Model Predictive Control for Keeping a Quadrotor Visible on the Camera Field-of-View of a Ground Robot", *2016 American Control Conference, Boston, USA, July 2016*

17. D. Panagou "Distributed coordination in multi-agent systems under local directed interactions: avoidance and aggregation", *54th IEEE Conference on Decision and Control, Osaka, Japan, December 2015*

16. D. Panagou, D. M. Stipanović and P. G. Voulgaris, "Vision-based dynamic coverage control for nonholonomic agents", *53rd IEEE Conference on Decision and Control, Los Angeles, CA, USA, December 2014*

15. D. Panagou, M. Turpin and V. Kumar, "Distributed Goal Assignment and Trajectory Generation for Multi-robot Networks: A Multiple Lyapunov Functions Approach", *2014 IEEE International Conference on Robotics and Automation, Hong Kong, China, June 2014*

14. D. Panagou "Motion planning and collision avoidance using navigation vector fields", *2014 IEEE International Conference on Robotics and Automation, Hong Kong, China, June 2014*

13. D. Panagou, D. M. Stipanović and P. G. Voulgaris, "Multi-objective control for multi-agent systems using Lyapunov-like barrier functions", *52nd IEEE Conference on Decision and Control, Firenze, Italy, December 2013*

12. S. Maniatopoulos, D. Panagou and K. J. Kyriakopoulos, "A Model Predictive Control scheme for the navigation of a nonholonomic vehicle with field-of-view constraints", *2013 American Control Conference, Washington DC, USA, June 2013*

11. D. Panagou and K. J. Kyriakopoulos, "Cooperative formation control of underactuated marine vehicles for target surveillance under sensing and communication constraints", *2013 IEEE International Conference on Robotics and Automation, Karlsruhe, Germany, May 2013*

10. D. Panagou and V. Kumar, "Maintaining visibility for Leader-Follower formations in obstacle environments", *2012 IEEE International Conference on Robotics and Automation, St. Paul, Minnesota, USA, May 2012*

9. D. Panagou, S. Maniatopoulos and K. J. Kyriakopoulos, "Control of an underactuated underwater vehicle in 3D space under field-of-view constraints", *IFAC Workshop on Navigation, Guidance and Control of Underwater Vehicles, Porto, Portugal, April 2012*

8. D. Panagou and K. J. Kyriakopoulos, "Control of underactuated systems with viability constraints", *50th IEEE Conference on Decision and Control and European Control Conference, Orlando, FL, USA, December 2011*

7. D. Panagou, H. G. Tanner and K. J. Kyriakopoulos, "Control of nonholonomic systems using reference vector fields", *50th IEEE Conference on Decision and Control and European Control Conference, Orlando, FL, USA, December 2011*

6. D. Panagou and K. J. Kyriakopoulos, "A switching control approach for the robust practical stabilization of a unicycle-like marine vehicle under non-vanishing perturbations", *2011 IEEE International Conference on Robotics and Automation, Shanghai, P.R. China, May 2011*

5. D. Panagou, H. G. Tanner and K. J. Kyriakopoulos, "Dipole-like fields for stabilization of systems with Pfaffian constraints", *2010 IEEE International Conference on Robotics and Automation, Anchorage, Alaska, USA, May 2010*

4. D. Panagou, K. Margellos, S. Summers, J. Lygeros and K. J. Kyriakopoulos, "A viability approach for the stabilization of an underactuated underwater vehicle in the presence of current disturbances", *48th IEEE Conference on Decision and Control, Shanghai, P.R. China, December 2009*

3. N. Papantonopoulos, D. Panagou and St. Alexandri, "A navigation system for underwater vehicles integrating DVL and USBL measurements", *9th Hellenic Symposium of Oceanography, Patras, Greece, May 2009*

2. D. Panagou, G. C. Karras and K. J. Kyriakopoulos, "Towards the stabilization of an underactuated underwater vehicle in the presence of unknown disturbances", *MTS/IEEE OCEANS 2008 Conference, Quebec City, Quebec, Canada, September 2008*

1. G. C. Karras, D. Panagou and K. J. Kyriakopoulos, "Target referenced localization of an underwater vehicle using a Laser based Vision System", *MTS/IEEE OCEANS 2006 Conference, Boston, MA, USA, September 2006*

Peer-Reviewed Book Chapters

1. D. Panagou, D. M. Stipanović, P. G. Voulgaris "Distributed Control of Robot Swarms: A Lyapunov-Like Barrier Functions Approach", *Handbook of Research on Design, Control, and Modeling of Swarm Robotics, IGI Global, December 2015*

Grants, Fellowships, & Awards

NARRO2W SPACE: Networked Adversarially-Resilient Reconfigurable Operations in Obstacle Worlds for Safe Planning and Attack-tolerant Control and Estimation. PI: Dimitra Panagou. 03/2023–02/2025. AFOSR. Total: $358,294. My Share: $358,294.

Socially-Aware Safe Navigation for Heterogeneous Multi-Agent Systems. PI: Dimitra Panagou. 03/2023–02/2024. Toyota Research North America. Total: $75,000. My Share: $75,000.

Multi-Robot Task Allocation and Navigation in Dynamically-Mapped Environments: Co-Design via Perception-Aware, Predictive Control Barrier Functions. PI: Dimitra Panagou. 12/2022–12/2023. Amazon Consumer Robotics. Total: $80,000. My Share: $80,000.

Collaborative Research: CPS: Medium: Enabling Autonomous, Persistent, and Adaptive Mobile Observational Networks Through Energy-Aware Dynamic Coverage. PI: Chris Vermillion. co-PIs: Dimitra Panagou, Ruoying He. 10/2022–09/2025. NSF. Total: $1,000,000. My Share: $350,000.

IUCRC Phase I University of Michigan: Center for Autonomous Air Mobility and Sensing (CAAMS). PI: Dimitra Panagou. co-PIs: Carlos Cesnik, Max Li. 04/2022–03/2027. NSF. Total: $416,716.

Intersection Management for Heterogeneous CAV and Conventional Traffic. PI: Dimitra Panagou. 05/2021-04/2022. Ford Motor Company, University Research Program (URP). Total $50,000. My Share: $50,000.

Multi-Agent Control and Estimation for Assured Autonomy against Adversaries in the Cyber and Physical Domains. PI: Dimitra Panagou. 05/2020– 04/2023. ONR. Total: $510,000. My Share: $510,000.

CAREER: Perceivability: Enabling Safe and Secure Autonomy via Synergistic Control, Observation and Learning. PI: Dimitra Panagou. 03/2020–02/2025. NSF. Total: $583,953. My Share: $583,953.

Enabling a Robotic Farming Revolution. co-PIs: Ella Atkins, Carlos Cesnik, Cindy Chestek, Dimitra Panagou, Shai Revzen, Elliot Rouse. 01/2020–12/2022. Kahn Foundation. Total $2,500,000. My Share $416,667.

CPS: Medium: Collaborative Research: Data-driven Modeling and Preview-Based Control for Cyber-Physical System Safety. PI: Necmiye Ozay, co-PIs: Dimitra Panagou, Sze Zheng Yong, Samet Oymak. 01/2020–12/2022. NSF. Total: $1,000,000. My Share: $285,495.

Adversarially Robust Coordination for Autonomous Multi-Vehicle Systems. PI: Dimitra Panagou. 02/2018–12/2020. US Army TARDEC, Automotive Research Center Phase V. Total: $321,597. My Share: $321,597.

IUCRC Phase II University of Michigan: Center for Unmanned Aircraft Systems (C-UAS). PI: Dimitra Panagou (as of 07/2022). 09/2017–08/2023. NSF. Total: $500,000. My Share: $100,000.

Aerial Swarm Defense: A Control-Theoretic Approach. PI: Dimitra Panagou. 09/2017–08/2020. Phase II I/UCRC University of Michigan: Center for Unmanned Aircraft Systems (C-UAS). My Share: $100,000.

Theory and Algorithms for Safe and Secure Dynamic Multi-Agent Systems, PI: Dimitra Panagou, 10/2017–05/2018. Army Research Office. Total $55,000. My Share: $55,000.

Control and Estimation for Provably Safe Interactive Driver Assistance. PI: Necmiye Ozay, co-PIs: Dimitra Panagou, Sze Zheng Yong. 01/2017–04/2019. Toyota Research Institute. Total: $707,669. My Share: $224,920.

2017 AFOSR YIP: From High-Level Task Specifications to Geometric Control via Lyapunov Abstractions. PI: Dimitra Panagou. 2017–2020. Total: $360,000. My Share: $360,000.

2016 NASA Early Career Faculty Award: The Astronet: A Human-Centric Network of Free Flying Co-Robots. PI: Dimitra Panagou. 2016–2020. Total: $600,000. My Share: $600,000.

Generalized Trajectory Modeling and Prediction for Unmanned Aircraft Systems. PI: Ella Atkins, Co-Is: Karthik Durasaimy, Anouck Girard, Ilya Kolmanovsky, Dimitra Panagou. 2016–2018. NASA SASO. Total: $999,150. My Share: $202,720.

Situational Awareness and Sustained Survivability through Man/Unmanned Teaming. PI: Dimitra Panagou. 2016–2018. US Army TARDEC, Automotive Research Center Phase IV. Total: $641,863. My Share: $641,863.

Vehicle Tethered Quadrotor Control. PI: Jason Corso. co-PIs: Necmiye Ozay, Dimitra Panagou. 2015. US Army TARDEC, Automotive Research Center Phase IV. Total: $23,809. My Share: $6,397.

Student Awards

Joseph Breeden, *2022 IEEE Conference on Decision and Control (CDC) Outstanding Student Paper Award.* Awarded to an author who is the primary contributor to the paper, and who was a student at the time of the original submission. The awards are based on the paper's originality, clarity, and potential impact on practical applications or theoretical foundations of control.

Joseph Breeden, *2022 IEEE TCAC (Technical Committee on Aerospace Control) Best Student Paper Award.* Awarded to one paper presented at IEEE CDC 2021 or IEEE CCTA 2021 in the area of the Technical Committee, whose primary author is a student.

Joseph Breeden, *2021 FXB Fellowship.* Awarded to one PhD student in Aerospace Engineering every year, to provide full coverage of tuition, fees, health insurance, and stipend for the remainder of the fellow's graduate study, or up to a maximum of four years.

Kunal Garg, *2021 Richard and Eleanor Towner Prize for Distinguished Academic Achievement Award.* Presented

to the outstanding graduate student (Master's or Ph.D. students) in each degree program.

Kunal Garg, *2021 Professor Pierre T. Kabamba Award.* Presented to one (or more) senior graduate student who has demonstrated excellence in research and scholarship in Aerospace Engineering or in an area of Control Systems.

Invited Lectures

Tunable Control Barrier Functions for Multi-Agent Safety via Trust Adaptation. Invited Speaker at the Decision and Control Laboratory Seminar Series, Georgia Institute of Technology. March 31, 2023.

Tunable Control Barrier Functions for Multi-Agent Safety via Trust Adaptation. Invited Speaker at the Seminar Series, Department of Aerospace Engineering, Texas A&M. March 23, 2023.

Control Barrier Functions under Input Constraints and Uncertainty with Applications to Spacecraft Control. Invited Speaker at the Seminar Series, Department of Aerospace Engineering, University of Illinois, Urbana-Champaign. November 14, 2022.

Fixed-Time Control Barrier Functions for Safety-Critical Control Applications under Disturbances. Invited Speaker at the Graduate Seminar Series, University of Iowa, (Virtual Event). April 21, 2022.

Fixed-Time Control Barrier Functions for Safety-Critical Control Applications in the Presence of Uncertainty. Invited Speaker at the Center for Information and Systems Engineering (CISE) seminar series, Boston University, (Virtual Event). November 5, 2021.

Fixed-Time Control Barrier Functions for Safety-Critical Control Applications in the Presence of Uncertainty. Invited Speaker at the Control Seminar Series, University of California San Diego (UCSD), (Virtual Event). October 29, 2021.

Estimation and safe robot control under uncertainty. Invited Speaker at the ICRA Workshop on Safe Robot Control with Learned Motion and Environment Models, IEEE International Conference on Robotics and Automation, (Virtual Event). June 4, 2021.

Safe and Adversarially-Robust Multi-Agent Systems. Invited Speaker at the Seminar Series at the Department of Aerospace Engineering and Mechanics, University of Minnesota, (Virtual Event). April 16, 2021.

Safety and Resilience for Multi-Agent Systems. Invited Speaker at the Control Group Seminar Series, University of Oxford, (Virtual Event). March 1, 2021.

Safe and Adversarially-Robust Multi-Robot Systems. Invited Speaker at the Robotics Science and Systems (RSS) workshop on Heterogeneous Multi-Robot Coordination and Task Allocation, (Virtual Event). July 12, 2020.

Multi-Agent Safety and Resilience: Theory and Algorithms for Adversarially-Robust, Scalable UAV Teams. Invited Speaker at the ACC workshop on Current Topics in Aerospace Controls, American Control Conference, (Virtual Event). June 30, 2020.

Human-Robot Interaction via Augmented Reality in Multi-Tasking Environments. Invited Speaker at the ICRA workshop on Human-Swarm Interaction, IEEE International Conference on Robotics and Automation, (Virtual Event). May 31, 2020.

Control Synthesis under Spatiotemporal Specifications. Invited Speaker at the DREAM/CPAR Seminar Series, University of California, Berkeley. March 2, 2020.

Control Synthesis under Spatiotemporal Specifications. Invited Speaker at the USC Cyber-Physical Systems Seminar Series, University of Southern California, Los Angeles, CA. January 22, 2020.

Adversarially-Robust Aerial Swarms. Invited Keynote Speaker at the 3rd International Symposium on Aerial Robotics (ISAR 2019), Toronto, Ontario, Canada. May 27-28, 2019.

A Safety and Resilience Framework Towards Adversarially-Robust Multi-Robot Teams. Invited Speaker at the ICRA Workshop on Resilient Robot Teams, IEEE International Conference on Robotics and Automation, Montreal, Canada. May 23-24, 2019.

Safety and Resilience in Multi-Agent Systems: Theory and Algorithms for Adversarially-Robust Multi-Robot Teams

and Human-Robot Collaboration. Invited Speaker at the Robotics Seminar Series, MIT. March 22, 2019.

Multi-Agent Control in Complex Environments with Finite-Time and Safety Guarantees. Invited talk at Caltech, Mechanical Eng. Department and CDS Department. March 8, 2019.

Resilient Leader-Follower Consensus to Arbitrary Reference Values in Time-Varying Graphs. Invited talk at the 7th Midwest Workshop on Game and Control Theory, Michigan State University, East Lansing. April 29, 2018.

Persistent Coverage Control for Constrained Multi-UAV Systems. Invited talk at the Aerospace Seminar Series, and the Robotics, Controls, and Dynamics Seminar Series, University of Colorado Boulder. April 27, 2018.

Persistent Coverage Control for Constrained Multi-UAV Systems. Invited talk at the Robotics Seminar Series at Stanford University. March 9, 2018.

A Distributed Semi-cooperative Coordination Protocol for Dynamic Multi-Agent Systems. Invited Talk at the 5th Midwest Workshop on Game and Control Theory, Purdue University, West Lafayette. May 1, 2016.

Distributed Coordination and Coverage Control for Multi-Agent Systems in Constrained Environments. Invited Talk at the Control Seminar Series, Coordinated Science Laboratory, University of Illinois, Urbana-Champaign. March 30, 2016

Coordination and Feedback Control Strategies for Underactuated Vehicles in Constrained Environments. Invited Talk at the Laboratory for Computational Sensing and Robotics, Johns Hopkins University. June 19, 2013

Professional and Outreach Activities

Capstone advisor for College of Engineering Honors Program (mentoring one undergraduate student), University of Michigan. September 2021–April 2022.

Faculty advisor of the BLiSS (Bioastronautics and Life Support Systems) Student Project Team, for the Moon to Mars eXploration Systems and Habitation (M2M X-Hab) Academic Challenge, 2021–2022.

Mentor for the GRIN Mentorship Program (mentoring one postdoctoral researcher), University of Michigan. September 2020 – April 2021.

Invited speaker at the Galaxy Girls Virtual Program, CEDO Online Panel on Aerospace Engineering, University of Michigan. July 2020.

Organizer of the invited session "Theory and Applications of Control Barrier Functions", IEEE Conference on Decision and Control, Jeju Island, Republic of Korea, December 2020.

Co-Organizer of the workshop "Human-Swarm Interaction", IEEE International Conference on Robotics and Automation, Nice, France. May 2020.

Invited panelist at a faculty panel organized by the Graduate Rackham International (GRIN), a student organization sponsored by Rackham Graduate School, University of Michigan. April 15, 2020.

Invited speaker of the mini course on control "Multi-Agent Control for Safety-Critical Systems", 14th Young Researcher Workshop on Geometry, Mechanics and Control. Goettingen, Germany, December 16-18, 2019.

Seminar speaker at the Saturday Morning Physics (SMP) Lecture, LSA Physics, University of Michigan. October 19, 2019.

Invited panelist at the WAA - Women in Aerospace Conference, October 2019.

Invited speaker at the Recruitment Aerospace Seminar, University of Michigan. April 2019.

Invited faculty at the "University Women in Blue" workshop, organized by Blue Origin. Seattle, WA. November 2017.

Co-Chair of the Organizing Committee for the 6th Midwest Workshop on Game and Control Theory. University of Michigan, Ann Arbor, MI. April 2017.

Member of the Organizing Committee of the Michigan Robotics Day. Ann Arbor, MI. April 2017.

Member of the Organizing Committee of the Michigan Robotics Day. Organizer of a Breakout Session on "Aerial

Robotics". Ann Arbor, MI. April 2016.

Senior Member, Institute of Electrical and Electronics Engineers, 2008–Present.

Senior Member, American Institute of Aeronautics and Astronautics, 2014–Present.

Associate Editor: 61st IEEE Conference on Decision and Control (CDC)

Associate Editor: IEEE Transactions on Robotics, to start 06/2022

Associate Editor: 2022 IEEE International Conference on Robotics and Automation (ICRA)

Associate Editor: 2022 IEEE American Control Conference (ACC)

Associate Editor: IFAC Automatica, 07/2021–present

Program Committee Member: 2020 Hybrid Systems: Computation and Control (HSCC) Conference

Associate Editor: 2020 AIAA GNC at Scitech

Program Committee Member: 2018 Robotics: Science and Systems (RSS) Conference

Associate Editor: 2016 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

Associate Editor: 2015 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

Associate Editor: 2014 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

Reviewer: IEEE Transactions on Automatic Control; IEEE Transactions on Control of Network Systems; IEEE Transactions on Control Systems Technology; IFAC Automatica; IEEE Transactions on Robotics; AIAA Journal of Guidance, Control and Dynamics; International Journal of Robotics Research; ASME Journal of Dynamic Systems Measurement and Control; IEEE Transactions on Automation Science and Engineering; Control Engineering Practice; IET Journal on Control Theory and Applications; International Journal on Advanced Robotic Systems; International Journal of Control
IEEE Int. Conf. on Robotics and Automation (ICRA), IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS), IEEE Conf. on Decision and Control (CDC), American Control Conference (ACC), IEEE Mediterranean Conference on Control and Automation (MED), IEEE Multi-conference on Systems and Control (MSC), European Control Conference (ECC), IFAC World Congress, AIAA Scitech

Teaching

University of Michigan

AE 470: Control of Aerospace Vehicles (F21, F22)

AE 740: Multi-Agent Control (W20, W22)

AE 551/EECS 562: Nonlinear Systems and Control (W18, W19, W23)

AE 584: Navigation and Guidance of Aerospace Vehicles (W15, W16, W17, F17, F18, F19)

AE 348: Aircraft Dynamics and Control (F15, F16)

ROB 501: Math for Robotics (F23)

University of Illinois, Urbana-Champaign

AE 403: Spacecraft Attitude Control, Spring 2014, Co-Instructor

National Technical University of Athens

Nonlinear Systems, Spring 2010, 2011, 2012, Lecturer

Advising

Postdoctoral Researchers:

Aquib Mustafa (September 2020–December 2021)

Ehsan Arabi (December 2018–August 2020)

Mohammadreza Radmanesh (April 2019–March 2020)

Parag Bobade (April 2018–March 2019)

Dongkun Han (December 2016–December 2017)

Ph.D. Students:

William Bentz (September 2015–April 2020).
PhD thesis title: *"Dynamic Coverage Control and Estimation in Collaborative Networks of Human-Aerial/Space Co-Robots"*. Currently a GNC Engineer with the Attitude Control Systems Engineering Branch at NASA's Goddard Space Flight Center.

Kunal Garg (September 2016–April 2021).
PhD thesis title: *"Advances in the Theory of Fixed-time Stability with Applications in Constrained Control and Optimization"*. Currently a Postdoctoral Research at MIT Aero Astro.

James Usevitch (September 2016–April 2021).
PhD thesis title: *"Advancements in Adversarially-Resilient Consensus and Safety-Critical Control for Multi-Agent Networks"*. Starting as Assistant Professor in the Department of Electrical and Computer Engineering, Brigham Young University.

Vishnu Chipade (September 2017–April 2022).
PhD thesis title: *"Collaborative Task Allocation and Motion Planning for Multi-Agent Systems in the Presence of Adversaries"*. Currently a Postdoctoral Researcher at Northeastern University.

Mitchell Black (January 2020–April 2023).
PhD thesis title: *"Toward Safe Control under Uncertainty: Adaptation and Prediction for Control Barrier Functions"*. Currently a Research Engineer at Toyota Motor North America.

Joseph Breeden (September 2019–today)

Alia Gilbert (September 2020–today)

Hardik Parwana (September 2020–today)

Devansh Agrawal (September 2020–today)

Kaleb Ben Naveed (September 2022–today)

Andre Lim (September 2023–)

Haejoon Lee (September 2023–)

Taekyung Kim (September 2023–)

Master's Students:

Jiangbo Yu (May 2023–today)

Ruiyang Wang (January 2023–today)

Rajiv Govindjee (January 2023–April 2023)

Rahul Swayampakula (November 2022–April 2023)

Ruichang Chen (April 2022–December 2022)

Sidharth Prasad (April 2022–June 2022)

Qilang Ding (July 2021–August 2021)

Venkata Sai Aditya Marella (May 2020–April 2021)

Prit Chovatiya (May 2020–December 2020)

Gillian McGlothin (September 2019–April 2020)

Lixing Huang (September 2017–December 2019)

Harvard Humphrey (May 2019–August 2019)

Akhilesh Mohan (January 2019–December 2019)

Zhu Wang (May 2019–August 2019)

Aishwarya Unnikrishnan (January 2019–May 2019)

Nathan Minsk (May 2018–May 2019)

Sahib Dhanjal (May 2018–May 2019)

Snigdhaa Hasija (September 2018–December 2018)

Ruilin Zhou (September 2018–December 2018)

David Lee (September 2016–May 2017)

Mitchell Coon (May 2016–May 2017)

Tru Hoang (December 2015–May 2017)

Enkhmurun Bayasgalan (December 2015–December 2016)

Mason Sutorius (Summer 2016)

Rashmi Hegde (January 2015–September 2015)

Wei Ding (May 2015–December 2015)

590 Independent Studies:

Sriram Priyadharshan (ROB)

Vaishnavi Harikumar

Jiangbo Yu (ROB)

Anurekha Ravikumar (ROB)

Ruiyang Wang (ROB)

Nicole Campbell (ROB)

Harsh Jhaveri (ROB)

Weihang Tan (ROB)

Matthew Liu

Anirudh Aatresh

Qilang Ding (ROB)

Hao Zhou (ROB)

Venkata Sai Aditya Marella

Harshil Dadhaniya

Aishwarya Unnikrishnan (ROB)

Weifan Zhang (ROB)

Harvard Humphrey

Akhilesh Mohan (ROB)

Zhu Wang

Karan Mahajan (ROB)

Brandt Monson

Xiaoyu Zhang (ROB)

Mason Sutorius (ROB)

Yuchen Bai

Sourav Mohanty

Undergraduate Students:

John Pye (August 2022–December 2022)

Alexander Sena (May 2018–December 2019)

Yucheng Yin (Summer 2017)

Weilin Xu (Summer 2017)

Derek Heard (January 2017–April 2017)

Lixing Huang (Summer 2016)

Zhipeng Xu (Summer 2016)

Xiaobai Ma (December 2014–May 2016)

Zhenkai Wang (December 2014–May 2016)

Ziyuan Jiao (December 2014–December 2015)

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