

Iasson Karafyllis

Curriculum Vitae

Personal Data

Name: Iasson Karafyllis

Date of Birth: 14/9/1971

Place of Birth: Athens, Greece

Family Status: Married, two children

Office Address: Dept. of Mathematics, National Technical University of Athens
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Professional Experience

March 2023 - now: Professor of Mathematics, Department of Mathematics, National Technical University of Athens.

September 2017 – March 2023: Associate Professor in the Department of Mathematics, National Technical University of Athens.

February 2013 – September 2017: Assistant Professor in the Department of Mathematics, National Technical University of Athens.

Courses: Calculus for Engineers, Numerical Analysis for Engineers, Differential Equations for Engineers, Optimal Control for mathematicians, Mathematical Modeling for mathematicians, Dynamical Systems for mathematicians, Feedback Control Design for mathematicians, Nonlinear Control for mathematicians (graduate level).

June 2019 – July 2019: Visiting Professor in the University of Caen, Normandy, France.

September 2006 – January 2013: Assistant Professor in the Dept. of Environmental Engineering, Technical University of Crete.

Courses: Optimization Theory for Engineers, Mathematical Modeling, Automatic Control, Dynamical Systems in Mathematical Biology (graduate level), Numerical methods for PDEs (graduate level).

September 2003 - July 2006: Lecturer in the Dept. of Economics, University of Athens.

Courses: Calculus for Economists, Differential Equations for Economists, Dynamical Systems for Economists (graduate level).

September 2003 - July 2006: Lecturer in the Dept. of Mathematics, National Technical University of Athens.

Course : Nonlinear Control Theory (graduate level).

Studies

1998-2003: Ph.D. in Mathematics, Dept. of Mathematics, National Technical University of Athens. Advisor: John Tsinias. Ph.D. Thesis: “Time-Varying Feedback and Non-Uniform Stability”, Athens, Greece, 2003.

1995-1997: M.Sc. in Mathematics, Dept. of Mathematics, University of Minnesota.

1994-1995: M.Sc. in Process Integration, Dept. of Process Integration, University of Manchester Institute of Science and Technology (UMIST).

1989-1994: Diploma in Chemical Engineering, Dept. of Chemical Engineering, National Technical University of Athens.

Research Data

Research Monographs: 3

Edited Books: 1

Book Chapters: 6

Journal Papers: 116

Conference Papers: 64

Citations: 5807 (Google Scholar, 2/11/2023).

H-index: 42 (Google Scholar, 2/11/2023).

Google Scholar Profile: <http://scholar.google.com/citations?user=qqTIIgUAAAAJ&hl=en>

Additional Information

- Associate Editor for the *American Control Conference 2009-18* and for the *IEEE Conference on Decision and Control 2009-18*. Associate Editor for the *IFAC World Congress 2016*.
- Member of the Technical Program Committee of the *Chinese Control and Decision Conference 2011-14*.
- Member of the International Program Committee of the *European Control Conference 2015*.
- Associate Editor for the *International Journal of Control* (2013-now).
- Associate Editor for *IMA Journal of Mathematical Control and Information* (2013-now).
- Associate Editor for *Systems and Control Letters* (2019-now).
- Associate Editor for *Mathematics of Control, Signals, and Systems* (2020-now).
- Reviewer for the following journals: *Automatica*, *IEEE Transactions on Automatic Control*, *Mathematics of Control Signals and Systems*, *IMA Journal of Mathematical Control and Information*, *SIAM Journal on Control and Optimization*, *International Journal of Robust and Nonlinear Control*, *International Journal of Control*, *European Journal of Control*, *Systems and Control Letters*, *Journal of Difference Equations and Applications*.
- Reviewer for *Mathematical Reviews* (American Mathematical Society).

Ph.D. Supervision

- Katerina Chrysafi (2018-2023). Title of Thesis: Feedback Design Problems for Control Systems.
- Filippos Vokos (2021-now). Topic: Control of the viscous Saint-Venant model.
- Alexandros Aslanidis (2021-now). Topic: Obtaining KL estimates for systems under adaptive control.

Awards

- O. Hugo Schuck best paper award (theory) in ACC 2019 (with S. Koga and M. Krstic) for the paper with title “Input-to-State Stability for the Control of Stefan Problem with Respect to Heat Loss at the Interface” (paper C39).

Books

- B1. I. Karafyllis and Z.-P. Jiang, *Stability and Stabilization of Nonlinear Systems*, Springer-Verlag, London (Series: Communications and Control Engineering), 2011.
- B2. I. Karafyllis and M. Krstic, *Predictor Feedback for Delay Systems: Implementations and Approximations*, Birkhäuser, Boston (Series: Mathematics, Systems & Control: Foundations & Applications), 2017.
- B3. I. Karafyllis and M. Krstic, *Input-to-State Stability for PDEs*, Springer-Verlag, London (Series: Communications and Control Engineering), 2019.

Edited Books

- B4. *Recent Results on Nonlinear Time Delayed Systems*, I. Karafyllis, M. Malisoff, F. Mazenc and P. Pepe (Eds.), Advances in Delays and Dynamics, Vol. 4, Springer, 2015.

Book Chapters

- BC1. I. Karafyllis and P. Pepe, “A Note on Converse Lyapunov Results for Neutral Systems”, *Recent Results on Nonlinear Time Delayed Systems*, I. Karafyllis, M. Malisoff, F. Mazenc and P. Pepe (Eds.), Advances in Delays and Dynamics, Vol. 4, Springer, 2015.
- BC2. T. Ahmed-Ali, I. Karafyllis, M. Krstic and F. Lamnabhi-Lagarrigue, “Robust Stabilization of Nonlinear Globally Lipschitz Delay Systems”, *Recent Results on Nonlinear Time Delayed Systems*, I. Karafyllis, M. Malisoff, F. Mazenc and P. Pepe (Eds.), Advances in Delays and Dynamics, Vol. 4, Springer, 2015.
- BC3. I. Karafyllis, M. Malisoff, F. Mazenc, and P. Pepe, “Stabilization of Nonlinear Delay Systems: A Tutorial on Recent Results”, *Recent Results on Nonlinear Time Delayed Systems*, I. Karafyllis, M. Malisoff, F. Mazenc and P. Pepe (Eds.), Advances in Delays and Dynamics, Vol. 4, Springer, 2015.
- BC4. I. Karafyllis and M. Krstic, “An ODE Observer for Lyapunov-Based Global Stabilization of a Bioreactor Nonlinear PDE”, *Feedback Stabilization of Controlled Dynamical Systems*, Nicolas Petit (Ed.), Lecture Notes in Control and Information Sciences, Vol. 473, Springer, 2017.

- BC5. I. Karafyllis and M. Krstic, “Sampled-Data Stabilization of Nonlinear Delay Systems with a Compact Absorbing Set and State Measurement”, *Time Delay Systems, Theory, Numerics, Applications, and Experiments*, T. Insperger, T. Ersal and G. Orosz (Eds.), Advances in Delays and Dynamics, Vol. 7, Springer, 2017.
- BC6. I. Karafyllis and M. Krstic, “Input-to-State Stability for PDEs”, *Encyclopedia of Systems and Control*, J. Baillieul and T. Samad (Eds), Springer, 2nd Edition, 2021.

Journal Publications

1. J. Tsinias and I. Karafyllis, “ISS Property for Time-Varying Systems and Application to Partial-State Feedback Stabilization and Asymptotic Tracking”, *IEEE Transactions Automatic Control*, **44(11)**, 1999, pp. 2179-2185.
2. I. Karafyllis, “Non-Uniform Stabilization of Control Systems”, *IMA Journal of Mathematical Control and Information*, **19(4)**, 2002, pp. 419-444.
3. I. Karafyllis, “Necessary and Sufficient Conditions for the Existence of Stabilizing Feedback for Control Systems”, *IMA Journal of Mathematical Control and Information*, **20(1)**, 2003, pp. 37-64.
4. I. Karafyllis and J. Tsinias, “Global Stabilization and Asymptotic Tracking for a Class of Nonlinear Systems by Means of Time-Varying Feedback”, *International Journal of Robust and Nonlinear Control*, **13(6)**, 2003, pp. 559-588.
5. I. Karafyllis and J. Tsinias, “A Converse Lyapunov Theorem for Non-Uniform in Time Global Asymptotic Stability and Stabilization by Means of Time-Varying Feedback”, *SIAM Journal Control and Optimization*, **42(3)**, 2003, pp. 936-965.
6. I. Karafyllis and J. Tsinias, “Non-Uniform in Time Stabilization for Linear Systems and Tracking Control for Nonholonomic Systems in Chained Form”, *International Journal of Control*, **76(15)**, 2003, pp. 1536-1546.
7. I. Karafyllis and J. Tsinias, “Non-Uniform in Time Input-to-State Stability and the Small-Gain Theorem”, *IEEE Transactions Automatic Control*, **49(2)**, 2004, pp. 196-216.
8. I. Karafyllis, “The Non-Uniform in Time Small-Gain Theorem for a Wide Class of Control Systems with Outputs”, *European Journal of Control*, **10(4)**, 2004, pp. 307-323.
9. I. Karafyllis, “Non-Uniform in Time Robust Global Asymptotic Output Stability”, *Systems and Control Letters*, **54(3)**, 2005, pp. 181-193.
10. I. Karafyllis, “Applications of Non-Uniform in Time Robust Global Asymptotic Output Stability to Robust Partial State Feedback Stabilization”, *Systems and Control Letters*, **54(10)**, 2005, pp. 939-951.
11. I. Karafyllis and C. Kravaris, “Robust Output Feedback Stabilization and Nonlinear Observer Design”, *Systems and Control Letters*, **54(10)**, 2005, pp. 925-938.
12. I. Karafyllis, “Non-Uniform Robust Global Asymptotic Stability for Discrete-Time Systems and Applications to Numerical Analysis”, *IMA Journal of Mathematical Control and Information*, **23(1)**, 2006, pp. 11-41.
13. I. Karafyllis, “Lyapunov Theorems for Systems Described by Retarded Functional Differential Equations”, *Nonlinear Analysis: Theory, Methods and Applications*, **64(3)**, 2006, pp. 590-617.
14. I. Karafyllis, “Non-Uniform in Time Robust Global Asymptotic Output Stability for Discrete-Time Systems”, *International Journal of Robust and Nonlinear Control*, **16(4)**, 2006, pp. 191-214.

15. I. Karafyllis, "Finite-Time Global Stabilization by Means of Time-Varying Distributed Delay Feedback", *SIAM Journal Control and Optimization*, **45(1)**, 2006, pp. 320-342.
16. I. Karafyllis, "Stabilization by Means of Time-Varying Hybrid Feedback", *Mathematics of Control, Signals and Systems*, **18(3)**, 2006, pp. 236-259.
17. I. Karafyllis and S. Kotsios, "Necessary and Sufficient Conditions for Robust Global Asymptotic Stabilization of Discrete-Time Systems", *Journal of Difference Equations and Applications*, **12(7)**, 2006, pp. 741-768.
18. I. Karafyllis and C. Kravaris, "On the Observer Problem for Discrete-Time Control Systems", *IEEE Transactions on Automatic Control*, **52(1)**, 2007, pp. 12-25.
19. I. Karafyllis, "A System-Theoretic Framework for a Wide Class of Systems I: Applications to Numerical Analysis", *Journal of Mathematical Analysis and Applications*, **328(2)**, 2007, pp. 876-899.
20. I. Karafyllis, "A System-Theoretic Framework for a Wide Class of Systems II: Input-to-Output Stability", *Journal of Mathematical Analysis and Applications*, **328(1)**, 2007, pp. 466-486.
21. I. Karafyllis and Z.-P. Jiang, "A Small-Gain Theorem for a Wide Class of Feedback Systems with Control Applications", *SIAM Journal Control and Optimization*, **46(4)**, 2007, pp. 1483-1517.
22. I. Karafyllis, C. Kravaris, L. Syrou and G. Lyberatos, "A Vector Lyapunov Function Characterization of Input-to-State Stability with Application to Robust Global Stabilization of the Chemostat", *European Journal of Control*, **14(1)**, 2008, pp. 47-61.
23. P. Pepe, I. Karafyllis and Z.-P. Jiang, "On the Liapunov-Krasovskii Methodology for the ISS of Systems described by Coupled Delay Differential and Difference Equations", *Automatica*, **44(9)**, 2008, pp. 2266-2273.
24. I. Karafyllis and C. Kravaris, "Non-Uniform in Time State Estimation of Dynamical Systems", *Systems and Control Letters*, **57(9)**, 2008, pp. 714-725.
25. I. Karafyllis, "Global Stabilization by Means of Discrete-Delay Static Output Feedback", *Systems and Control Letters*, **57(12)**, 2008, pp. 987-995.
26. I. Karafyllis, P. Pepe and Z.-P. Jiang, "Global Output Stability for Systems Described by Retarded Functional Differential Equations: Lyapunov Characterizations", *European Journal of Control*, **14(6)**, 2008, pp. 516-536.
27. I. Karafyllis, P. Pepe and Z.-P. Jiang, "Input-to-Output Stability for Systems Described by Retarded Functional Differential Equations", *European Journal of Control*, **14(6)**, 2008, pp. 539-555.
28. G. Athanasiou, I. Karafyllis and S. Kotsios, "Price Stabilization Using Buffer Stocks", *Journal of Economic Dynamics and Control*, **32(4)**, 2008, pp. 1212-1235.
29. I. Karafyllis and J. Tsiniias, "Control Lyapunov Functions and Stabilization by Means of Continuous Time-Varying Feedback", *ESAIM Control, Optimisation and Calculus of Variations*, **15(3)**, 2009, pp. 599-625.
30. I. Karafyllis and C. Kravaris, "Robust Global Stabilizability by Means of Sampled-Data Control with Positive Sampling Rate", *International Journal of Control*, **82(4)**, 2009, pp. 755-772.
31. I. Karafyllis and C. Kravaris, "Global Stability Results for Systems under Sampled-Data Control", *International Journal of Robust and Nonlinear Control*, **19(10)**, 2009, pp. 1105-1128.
32. I. Karafyllis, P. Pepe and Z.-P. Jiang, "Stability Results for Systems Described by Coupled Retarded Functional Differential Equations and Functional Difference Equations", *Nonlinear Analysis, Theory, Methods and Applications*, **71(7-8)**, 2009, pp. 3339-3362.
33. I. Karafyllis, C. Kravaris and N. Kalogerakis, "Relaxed Lyapunov Criteria for Robust Global Stabilization of Nonlinear Systems", *International Journal of Control*, **82(11)**, 2009, pp. 2077-2094.

34. I. Karafyllis and C. Kravaris, "From Continuous-Time Design to Sampled-Data Design of Observers", *IEEE Transactions on Automatic Control*, **54(9)**, 2009, pp. 2169-2174.
35. I. Karafyllis and Z.-P. Jiang, "Stability and Control of Nonlinear Systems Described by Retarded Functional Equations: A Review of Recent Results", *Science in China Series F: Information Sciences*, **52(11)**, 2009, pp. 2104-2126.
36. I. Karafyllis and Z.-P. Jiang, "Necessary and Sufficient Lyapunov-like Conditions for Robust Nonlinear Stabilization", *ESAIM Control, Optimisation and Calculus of Variations*, **16(4)**, 2010, pp. 887-928.
37. I. Karafyllis, Z.-P. Jiang and G. Athanasiou, "Nash Equilibrium and Robust Stability in Dynamic Games: A Small-Gain Perspective", *Computers and Mathematics with Applications*, **60(11)**, 2010, pp. 2936-2952.
38. I. Karafyllis and L. Grüne, "Feedback Stabilization Methods for the Numerical Solution of Systems of Ordinary Differential Equations", *Discrete and Continuous Dynamical Systems: Series B*, **16(1)**, 2011, pp. 283-317.
39. I. Karafyllis and Z.-P. Jiang, "A Vector Small-Gain Theorem for General Nonlinear Control Systems", *IMA Journal of Mathematical Control and Information*, **28(3)**, 2011, pp. 309-344.
40. I. Karafyllis, "Stabilization By Means of Approximate Predictors for Systems with Delayed Input", *SIAM Journal on Control and Optimization*, **49(3)**, 2011, pp. 1100-1123.
41. I. Karafyllis and Z.-P. Jiang, "Hybrid Dead-Beat Observers for a Class of Nonlinear Systems", *Systems and Control Letters*, **60(8)**, 2011, pp. 608-617.
42. I. Karafyllis and M. Krstic, "Nonlinear Stabilization under Sampled and Delayed Measurements, and with Inputs Subject to Delay and Zero-Order Hold", *IEEE Transactions on Automatic Control*, **57(5)**, 2012, pp. 1141-1154.
43. I. Karafyllis and C. Kravaris, "Global Exponential Observers for Two Classes of Nonlinear Systems", *Systems and Control Letters*, **61(7)**, 2012, pp. 797-806.
44. I. Karafyllis and M. Krstic, "Global Stabilization of Feedforward Systems Under Perturbations in Sampling Schedule", *SIAM Journal on Control and Optimization*, **50(3)**, 2012, pp. 1389-1412.
45. I. Karafyllis, "Can We Prove Stability by Using A Positive Definite Function with Non Sign-Definite Derivative?", *IMA Journal of Mathematical Control and Information*, **29(2)**, 2012, pp. 147-170.
46. I. Karafyllis and Z.-P. Jiang, "A New Small-Gain Theorem with an Application to the Stabilization of the Chemostat", *International Journal of Robust and Nonlinear Control*, **22(14)**, 2012, pp. 1602-1630.
47. I. Karafyllis and Z.-P. Jiang, "Reduced Order Dead-Beat Observers for the Chemostat", *Nonlinear Analysis Real World Applications*, **14(1)**, 2013, pp. 340-351.
48. P. Pepe and I. Karafyllis, "Converse Lyapunov-Krasovskii Theorems for Systems Described by Neutral Functional Differential Equations in Hale's Form", *International Journal of Control*, **86(2)**, 2013, pp. 232-243.
49. I. Karafyllis and M. Krstic, "Delay-Robustness of Linear Predictor Feedback Without Restriction on Delay Rate", *Automatica*, **49(6)**, 2013, pp. 1761-1767.
50. T. Ahmed-Ali, I. Karafyllis and F. Lamnabhi-Lagarrigue, "Global Exponential Sampled-Data Observers for Nonlinear Systems with Delayed Measurements", *Systems and Control Letters*, **62(7)**, 2013, pp. 539-549.
51. I. Karafyllis and M. Krstic, "Robust Predictor Feedback for Discrete-Time Systems with Input Delays", *International Journal of Control*, **86(9)**, 2013, pp. 1652-1663.
52. I. Karafyllis and Z.-P. Jiang, "Global Stabilization of Nonlinear Systems Based on Vector Control Lyapunov Functions", *IEEE Transactions on Automatic Control*, **58(10)**, 2013, pp. 2550-2562.
53. I. Karafyllis and M. Krstic, "Stabilization of Nonlinear Delay Systems Using Approximate Predictors and High-Gain Observers", *Automatica*, **49(12)**, 2013, pp. 3623-3631.

54. I. Karafyllis, “Feedback Stabilization Methods for the Solution of Nonlinear Programming Problems”, *Journal of Optimization Theory and Applications*, **161(3)**, 2014, pp. 783-806.
55. I. Karafyllis, M. Krstic, T. Ahmed-Ali and F. Lamnabhi-Lagarrigue, “Global Stabilization of Nonlinear Delay Systems with a Compact Absorbing Set”, *International Journal of Control*, **87(5)**, 2014, pp. 1010-1027.
56. I. Karafyllis and M. Krstic, “On the Relation of Delay Equations to First-Order Hyperbolic Partial Differential Equations”, *ESAIM Control, Optimisation and Calculus of Variations*, **20(3)**, 2014, pp. 894 - 923.
57. I. Karafyllis and M. Krstic, “Numerical Schemes for Nonlinear Predictor Feedback”, *Mathematics of Control, Signals and Systems*, **26(4)**, 2014, pp. 519-546.
58. I. Karafyllis, M. Malisoff, M. de Queiroz, M. Krstic and R. Yang, “Predictor-Based Tracking for Neuromuscular Electrical Stimulation”, *International Journal of Robust and Nonlinear Control*, **25(14)**, 2015, pp. 2391-2419.
59. I. Karafyllis and M. Papageorgiou, “Global Exponential Stability for Discrete-Time Networks with Applications to Traffic Networks”, *IEEE Transactions on Control of Network Systems*, **2(1)**, 2015, pp. 68-77.
60. I. Karafyllis, M. Kontorinaki and M. Papageorgiou, “Global Exponential Stabilization of Freeway Models”, *International Journal of Robust and Nonlinear Control*, **26(6)**, 2016, pp. 1184-1210.
61. I. Karafyllis and M. Krstic, “Sampled-Data Stabilization of Nonlinear Delay Systems with a Compact Absorbing Set”, *SIAM Journal on Control and Optimization*, **54(2)**, 2016, pp. 790–818.
62. I. Karafyllis and M. Papageorgiou, “Stability Results for Simple Traffic Models Under PI-Regulator Control”, *IMA Journal of Mathematical Control and Information*, **33(2)**, 2016, pp. 209-229.
63. I. Karafyllis and M. Krstic, “ISS With Respect to Boundary Disturbances for 1-D Parabolic PDEs”, *IEEE Transactions on Automatic Control*, **61(12)**, 2016, pp. 3712-3724.
64. P. Pepe, I. Karafyllis and Z.-P. Jiang, “Lyapunov-Krasovskii Characterization of the Input-to-State Stability for Neutral Systems in Hale’s Form”, *Systems and Control Letters*, **102**, 2017, pp. 48-56.
65. I. Karafyllis and M. Krstic, “Global Dynamical Solvers for Nonlinear Programming Problems”, *SIAM Journal on Control and Optimization*, **55(2)**, 2017, pp. 1302-1331.
66. T. Ahmed-Ali, I. Karafyllis, F. Giri, M. Krstic, F. Lamnabhi-Lagarrigue, “Exponential Stability Analysis of Sampled-Data ODE-PDE Systems and Application to Observer Design”, *IEEE Transactions on Automatic Control*, **62(6)**, 2017, pp. 3091-3098.
67. I. Karafyllis and M. Krstic, “ISS in Different Norms for 1-D Parabolic PDEs With Boundary Disturbances”, *SIAM Journal on Control and Optimization*, **55(3)**, 2017, pp. 1716-1751.
68. I. Karafyllis and M. Krstic, “Sampled-Data Boundary Feedback Control of 1-D Linear Transport PDEs with Non-Local Terms”, *Systems and Control Letters*, **107**, 2017, pp. 68-75.
69. I. Karafyllis and M. Krstic, “Stability of Integral Delay Equations and Stabilization of Age-Structured Models”, *ESAIM Control, Optimisation and Calculus of Variations*, **23(4)**, 2017, pp. 1667-1714.
70. I. Karafyllis, M. Kontorinaki and M. Papageorgiou, “Robust Global Adaptive Exponential Stabilization of Discrete-Time Systems with Application to Freeway Traffic Control”, *IEEE Transactions on Automatic Control*, **62(12)**, 2017, pp. 6195-6208.
71. X. Li, R. Wang, I. Karafyllis, X.-M. Sun, “L₂-gain Analysis for Systems with Interval Time-Varying Delay based on the Switching Technique”, *Journal of the Franklin Institute*, **354(17)**, 2017, pp. 7968-7982.
72. I. Karafyllis and M. Krstic, “Sampled-Data Boundary Feedback Control of 1-D Parabolic PDEs”, *Automatica*, **87**, 2018, pp. 226-237.

73. K. Schmidt, I. Karafyllis and M. Krstic, “Yield Trajectory Tracking for Hyperbolic Age-Structured Population Systems”, *Automatica*, **90**, 2018, pp. 138-146.
74. I. Karafyllis and M. Krstic, “Small-Gain Stability Analysis of Certain Hyperbolic-Parabolic PDE Loops”, *Systems and Control Letters*, **118**, 2018, pp. 52-61.
75. I. Karafyllis and M. Krstic, “Adaptive Certainty-Equivalence Control With Regulation-Triggered Finite-Time Least-Squares Identification”, *IEEE Transactions on Automatic Control*, **63(10)**, 2018, pp. 3261-3275.
76. I. Karafyllis and M. Krstic, “Decay Estimates for 1-D Parabolic PDEs with Boundary Disturbances”, *ESAIM Control, Optimisation and Calculus of Variations*, **24(4)**, 2018, pp. 1511-1540.
77. T. Ahmed-Ali, I. Karafyllis, F. Giri and M. Krstic, “Sampled Boundary Observer For Strict-Feedback Nonlinear ODE Systems with Parabolic PDE Sensor”, *Automatica*, **101**, 2019, pp. 439-449.
78. I. Karafyllis, M. Krstic and K. Chrysafi, “Adaptive Boundary Control of Constant-Parameter Reaction-Diffusion PDEs Using Regulation-Triggered Finite-Time Identification”, *Automatica*, **103**, 2019, pp. 166-179.
79. A. Mironchenko, I. Karafyllis and M. Krstic, “Monotonicity Methods for Input-to-State Stability of Nonlinear Parabolic PDEs with Boundary Disturbances”, *SIAM Journal on Control and Optimization*, **57(1)**, 2019, pp. 510-532.
80. I. Karafyllis and M. Papageorgiou, “Feedback Control of Scalar Conservation Laws with Application to Density Control in Freeways by Means of Variable Speed Limits”, *Automatica*, **105**, 2019, pp. 228-236.
81. M. Kontorinaki, I. Karafyllis and M. Papageorgiou, “Global Exponential Stabilization of Acyclic Traffic Networks”, *International Journal of Control*, **92(3)**, 2019, pp. 564-584.
82. I. Karafyllis and M. Krstic, “Small-Gain-Based Boundary Feedback Design for Global Exponential Stabilization of 1-D Semilinear Parabolic PDEs”, *SIAM Journal on Control and Optimization*, **57(3)**, 2019, pp. 2016-2036.
83. I. Karafyllis, N. Bekiaris-Liberis and M. Papageorgiou, “Feedback Control of Nonlinear Hyperbolic PDE Systems Inspired by Traffic Flow Models”, *IEEE Transactions on Automatic Control*, **64(9)**, 2019, pp. 3647-3662.
84. I. Karafyllis, T. Ahmed-Ali and F. Giri, “Sampled-Data Observers for 1-D Parabolic PDEs with Non-Local Outputs”, *Systems and Control Letters*, **133**, 2019, 104553.
85. I. Karafyllis and M. Krstic, “Global Stabilization of a Class of Nonlinear Reaction-Diffusion PDEs by Boundary Feedback”, *SIAM Journal on Control and Optimization*, **57(6)**, 2019, pp. 3723-3748.
86. I. Karafyllis and M. Krstic, “Stability Results for the Continuity Equation”, *Systems and Control Letters*, **135**, 2020, 104594.
87. I. Karafyllis, M. Kontorinaki and M. Krstic, “Adaptive Control By Regulation-Triggered Batch Least-Squares”, *IEEE Transactions on Automatic Control*, **65(7)**, 2020, pp. 2842-2855.
88. I. Karafyllis, T. Ahmed-Ali and F. Giri, “A Note on Sampled-Data Observers”, *Systems and Control Letters*, **144**, 2020, 104760.
89. T. Ahmed-Ali, I. Karafyllis and F. Giri, “Sampled-Data Observers for Delay Systems and Hyperbolic PDE-ODE Loops”, *Automatica*, **123**, 2021, 109349.
90. S. Koga, I. Karafyllis and M. Krstic, “Towards Implementation of PDE Control for Stefan System: Input-to-State Stability and Sampled-Data Design”, *Automatica*, **127**, 2021, 109538.
91. N. Espitia, I. Karafyllis and M. Krstic, “Event-Triggered Boundary Control of Constant-Parameter Reaction-Diffusion PDEs: A Small-Gain Approach”, *Automatica*, **128**, 2021, 109562.
92. I. Karafyllis, “Lyapunov-Based Boundary Feedback Design For Parabolic PDEs”, *International Journal of Control*, **94(5)**, 2021, pp. 1247-1260.

93. I. Karafyllis, “On the Relation of IOS-Gains and Asymptotic Gains For Linear Systems”, *Systems and Control Letters*, **152**, 2021, 104934.
94. I. Karafyllis and M. Krstic, “ISS Estimates in the Spatial Sup-Norm for Nonlinear 1-D Parabolic PDEs”, *ESAIM Control, Optimisation and Calculus of Variations*, **27**, 2021, Special issue in the honor of Enrique Zuazua's 60th birthday, 57.
95. I. Karafyllis, N. Espitia and M. Krstic, “Event-Triggered Gain Scheduling of Reaction-Diffusion PDEs”, *SIAM Journal on Control and Optimization*, **59(3)**, 2021, pp. 2047-2067.
96. I. Karafyllis and A. Chaillet, “Lyapunov Conditions for Uniform Asymptotic Output Stability and a Relaxation of Barbälát’s Lemma”, *Automatica*, **132**, 2021, 109792.
97. I. Karafyllis, M. Kontorinaki and M. Krstic, “Boundary-to-Displacement Asymptotic Gains for Wave Systems With Kelvin-Voigt Damping”, *International Journal of Control*, **94(10)**, 2021, pp. 2822-2833.
98. M. Diagne and I. Karafyllis, “Event-Triggered Control of a Continuum Model of Highly Re-Entrant Manufacturing System”, *Automatica*, **134**, 2021, 109902.
99. M. Bagheri, I. Karafyllis, P. Naseradinmousavi and M. Krstic, “Adaptive Control of a Two-Link Robot Using Batch Least-Squares Identifier”, *IEEE/CCA Journal of Automatica Sinica*, **8(1)**, 2021, pp. 86-93.
100. B. Rathnayake, M. Diagne and I. Karafyllis, “Sampled-Data and Event-Triggered Boundary Control of a Class of Reaction-Diffusion PDEs with Collocated Sensing and Actuation”, *Automatica*, **137**, 2022, 110026.
101. I. Karafyllis, D. Theodosis and M. Papageorgiou, “Analysis and Control of a Non-Local PDE Traffic Flow Model”, *International Journal of Control*, **95(3)**, 2022, pp. 660-678.
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106. I. Karafyllis, D. Theodosis and M. Papageorgiou, “Lyapunov-Based Two-Dimensional Cruise Control of Autonomous Vehicles on Lane-Free Roads”, *Automatica*, **145**, 2022, 110517.
107. I. Karafyllis and M. Krstic, “Spill-Free Transfer and Stabilization of Viscous Liquid”, *IEEE Transactions on Automatic Control*, **67(9)**, 2022, pp. 4585-4597.
108. I. Karafyllis, F. Vokos and M. Krstic, “Feedback Stabilization of Tank-Liquid System with Robustness to Wall Friction”, *ESAIM Control, Optimisation and Calculus of Variations*, **28**, 2022, 81.
109. I. Karafyllis, P. Pepe, A. Chaillet and Y. Wang, “Is Global Asymptotic Stability Necessarily Uniform for Time-Delay Systems?”, *SIAM Journal on Control and Optimization*, **60(6)**, 2022, pp. 3237-3261.
110. I. Karafyllis, F. Vokos and M. Krstic, “Output-Feedback Control of Viscous Liquid-Tank System and its Numerical Approximation”, *Automatica*, **149**, 2023, 110827.
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114. A. Chaillet, I. Karafyllis, P. Pepe and Y. Wang, “Growth Conditions for Global Exponential Stability and exp-ISS of Time-Delay Systems Under Point-Wise Dissipation”, *Systems & Control Letters*, **178**, 2023, 105570.
115. D. Theodosis, I. Karafyllis, G. Titakis, I. Papamichail and M. Papageorgiou, “A Nonlinear Heat Equation Arising from Automated-Vehicle Traffic Flow Models”, *Journal of Computational and Applied Mathematics*, **437**, 2024, 115443.
116. I. Karafyllis and M. Krstic, “ISS-Based Robustness to Various Neglected Damping Mechanisms for the 1-D Wave PDE”, *Mathematics of Control, Signals, and Systems*, **35(4)**, 2023, pp. 741–779.
117. I. Karafyllis, A. Aslanidis and M. Krstic, “Adaptive Regulation with Global KL Guarantees”, to appear in *IEEE Transactions on Automatic Control* (see also [arXiv:2301.04300](https://arxiv.org/abs/2301.04300) [math.OC]).
118. I. Karafyllis and M. Papageorgiou, “A Particle Method for 1-D Compressible Fluid Flow”, to appear in *Studies in Applied Mathematics* (see also [arXiv:2301.04553](https://arxiv.org/abs/2301.04553) [math.AP]).
119. I. Karafyllis, M. Krstic and A. Aslanidis, “On Disturbance-to-State Adaptive Stabilization without Parameter Bound by Nonlinear Feedback of Delayed State and Input”, to appear in *SIAM Journal on Control and Optimization* (see also [arXiv:2304.02938](https://arxiv.org/abs/2304.02938) [math.OC]).

Submitted Papers

- S1. G. A. de Andrade, R. Vazquez, I. Karafyllis and M. Krstic, “Backstepping Control of a Hyperbolic PDE System with Zero Characteristic Speed States”, submitted to *IEEE Transactions on Automatic Control* (see also [arXiv:2211.14290](https://arxiv.org/abs/2211.14290) [math.OC]).
- S2. I. Karafyllis and T. Ahmed-Ali, “Sampled-Data Observer Design for Linear Kuramoto-Sivashinsky Systems with Non-Local Output”, submitted to *Automatica* (see also [arXiv:2212.01752](https://arxiv.org/abs/2212.01752) [math.OC]).
- S3. I. Karafyllis, F. Vokos and M. Krstic, “Feedback Stabilization of Tank-Liquid System with Robustness to Surface Tension”, submitted to the *International Journal of Control* (see also [arXiv:2301.01688](https://arxiv.org/abs/2301.01688) [math.OC]).
- S4. P.-E. Haacker, I. Karafyllis, M. Krstic and M. Diagne, “Stabilization of Age-Structured Chemostat Hyperbolic PDE with Actuator Dynamics”, submitted to the *International Journal of Robust and Nonlinear Control* (see also [arXiv:2306.14078](https://arxiv.org/abs/2306.14078) [math.OC]).
- S5. I. Karafyllis and M. Krstic, “Control of a Linearized Viscous Liquid-Tank System with Surface Tension”, submitted to *SIAM Journal on Control and Optimization* (see also [arXiv:2306.11543](https://arxiv.org/abs/2306.11543) [math.OC]).
- S6. E. Loko, A. Chaillet and I. Karafyllis, “Building Coercive Lyapunov-Krasovskii Functionals Based on Razumikhin and Halanay Approaches”, submitted to the *International Journal of Robust and Nonlinear Control*.

S7. I. Karafyllis, D. Theodosis and M. Papageorgiou, “Forward Completeness and Applications to Control of Automated Vehicles”, submitted to *IEEE Transactions on Automatic Control* (see also [arXiv:2307.11515](https://arxiv.org/abs/2307.11515) [math.OC]).

Participation in Research Programs

February 2013 – February 2018: Member of the research team for the research program “TRAMAN21 (Traffic Management for the 21st Century)”. Funding from the European Union (European Research Council). Website: <http://www.traman21.tuc.gr/>

October 2019 – Now: Member of the research team for the research program “TrafficFluid: Lane-free Artificial-Fluid Environment for Vehicular Traffic”. Funding from the European Union (European Research Council). Website: <https://www.trafficfluid.tuc.gr/index.php?id=11785>

Tables of Journal Papers

Year	99	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
Number of papers	1	1	4	2	3	6	4	7	7	2	4	5	7	4	2	4	8	5

Year	19	20	21	22	23	24
Number of papers	9	3	11	10	6	1

Number of coauthors	Number of published or accepted papers
0	21
1	50
2	35
3	8
4	4

Journal	Published Papers	Papers to appear	Submitted Papers
<i>Systems and Control Letters</i>	16	-	-
<i>Automatica</i>	16	-	1
<i>SIAM Journal Control and Optimization</i>	14	1	1
<i>IEEE Transactions on Automatic Control</i>	14	1	2
<i>International Journal of Control</i>	10	-	1
<i>International Journal of Robust and Nonlinear Control</i>	6	-	2
<i>IMA Journal of Mathematical Control and Information</i>	7	-	-
<i>ESAIM Control, Optimisation and Calculus of Variations</i>	7	-	-
<i>European Journal of Control</i>	4	-	-
<i>Journal of Mathematical Analysis and Applications</i>	2	-	-
<i>Nonlinear Analysis: Theory, Methods and Applications</i>	2	-	-
<i>Mathematics of Control, Signals and Systems</i>	4	-	-
<i>Journal of Difference Equations and Applications</i>	1	-	-
<i>Discrete and Continuous Dynamical Systems: Series B</i>	1	-	-
<i>Journal of Economic Dynamics and Control</i>	1	-	-
<i>Science in China Series F: Information Sciences</i>	1	-	-
<i>Computers and Mathematics with Applications</i>	1	-	-
<i>Nonlinear Analysis Real World Applications</i>	1	-	-
<i>Journal of Optimization Theory and Applications</i>	1	-	-
<i>IEEE Transactions on Control of Network Systems</i>	1	-	-
<i>Journal of the Franklin Institute</i>	2	-	-
<i>IEEE/CCA Journal of Automatica Sinica</i>	1	-	-
<i>Journal of Computational and Applied Mathematics</i>	1	-	-
<i>Studies in Applied Mathematics</i>	-	1	
Total number of papers	116	3	7

Research Interests

1) Stability Theory of Dynamical Systems with emphasis on Lyapunov stability theory for uncertain nonlinear deterministic systems described by:

- a. finite or infinite dimensional difference equations [12, 14, 37, 46, 59],
- b. ordinary differential equations [5, 6, 7, 8, 9, 19, 20, 21, 22, 39, 45, 46, 65, 93, 96, 105],
- c. retarded functional differential and integral equations [8, 13, 19, 20, 21, 26, 27, 32, 35, 39, 46, 48, 56, 64, 69, 71, 93, 96, 109, 113, 114, BC1, BC4, S6],
- d. first-order hyperbolic partial differential equations [32, 56, 69, 83, 86, BC4, BC6],
- e. parabolic partial differential equations [63, 67, 72, 76, 79, 93, 94, BC6],
- f. coupled retarded functional differential equations and functional difference equations [19, 20, 21, 23, 39, 46],
- g. impulsive differential equations (hybrid systems, systems under sampled-data control) [16, 19, 20, 21, 31, 39, 46, 66, 68, 72],
- h. coupled partial differential equations and higher-order partial differential equations [74, 97, 102, 105, 107, 115, 116, 118].

2) Mathematical Systems and Control Theory with emphasis on the solution of robust feedback stabilization problems [1, 2, 3, 4, 5, 10, 11, 15, 16, 17, 22, 25, 29, 30, 33, 35, 36, 40, 42, 44, 49, 51, 52, 53, 55, 56, 57, 60, 61, 62, 68, 69, 70, 72, 80, 81, 82, 83, 85, 89, 90, 91, 92, 95, 98, 101, 102, 107, 108, 109, 110, 119, BC2, BC3, BC4, BC5, S1, S3, S4, S5], regulation problems [70, 75, 78, 87, 96, 99, 100, 103, 104, 106, 111, 117, 119], tracking control problems [1, 4, 6, 58, 73, S7] and observer design/existence problems [11, 18, 24, 34, 41, 43, 47, 50, 66, 77, 84, 88, 89, S2] for nonlinear uncertain deterministic control systems of the above classes.

3) Applications of major results of Mathematical Control Theory to Game Theory [37], Fixed Point Theory [37], Nonlinear Programming [54, 65], Mathematical Biology [22, 30, 33, 46, 47, 69], Mathematical Economics [28, 37], Mathematical Physics [86, 97] and Numerical Analysis [38, 118].

4) Applications of major results of Numerical Analysis to Mathematical Systems and Control Theory [12, 25, 40, 57, 58, 61, BC5].

5) Mathematical modeling of traffic systems [59, 60, 62, 70, 80, 81, 83, 101, 104, 105, 108, 115, S7] and modeling of physical, chemical, biological and economic phenomena [22, 28, 33, 37, 69, 73, 74].

6) Applications of major results of Non-Smooth Analysis and Set-Valued Analysis to Mathematical Systems and Control Theory [3, 17].