DIMITRIOS HRISTU-VARSAKELIS

Department of Applied Informatics
University of Macedonia
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POSITIONS HELD

UNIVERSITY OF MACEDONIA Thessaloniki, Greece
Associate Professor, Dept. of Applied Informatics (02/05 – present)

UNIVERSITY OF MARYLAND, COLLEGE PARK College Park, MD
Assistant Professor, Mechanical Engineering, 8/00-2/05, and
　　　　　　　　Institute for Systems Research, 08/02-02/05

Research Associate, Institute for Systems Research, 8/99-8/00

HARVARD UNIVERSITY Cambridge, MA
Post-doctoral Fellow, Division of Engineering and Applied Sciences, 6/99-8/99.
Research Assistant, Division of Engineering and Applied Sciences, 7/94-6/99.

RENSSELAER POLYTECHNIC INSTITUTE Troy, NY
Research Assistant, NY Center for Advanced Technology, 8/92-5/94.

EDUCATION

HARVARD UNIVERSITY Cambridge, MA
Ph.D. in Engineering Sciences, June 1999
Doctoral thesis: "Optimal Control with Limited Communication"
Advisor: Roger W. Brockett

M.S. in Applied Mathematics, March 1997

RENSSELAER POLYTECHNIC INSTITUTE Troy, NY
M.S. in Electrical Engineering, May 1994

UNIVERSITY OF CALIFORNIA AT BERKELEY Berkeley, CA
B.S. in Electrical Engineering and Computer Science, May 1992

RESEARCH & SCHOLARLY INTERESTS

OPTIMIZATION AND DECISION-MAKING
Modeling and analysis of decision problems. Automatic Control. Networked Control Systems. Bio-inspired Optimization. Applications in Socio-economic systems. Optimal Taxation. Optimization of Economic systems with Environmental constraints.

DYNAMICS OF SOCIO-ECONOMIC SYSTEMS
Decision-making in socio-economic systems. Mathematical modeling of consensus and opinion formation.

APPLIED MATHEMATICS
Dynamical systems and control, Stochastic processes, Cryptographic protocols, Provable security.

PAPERS & PUBLICATIONS	J20. N. Goumagias and D. Hristu-Varsakelis, "Tax evasion by risk-averse firms in Greece: a discrete Markov-based optimization Model", Optimization, 62(8), p. 1153-1167, 2013.
A. JOURNAL ARTICLES	J19. N. Goumagias, D. Hristu-Varsakelis, A. Saraidaris, "A Decision Support Model for Tax Revenue Collection in Greece", Decision Support Systems vol. 53 (2012), p. 76-96. (ISI IF=2.135 για το 2012) http://dx.doi.org/10.1016/j.dss.2011.12.006

J18. D. Hristu-Varsakelis, S. Karagianni, M. Pempetzoglou, A. Sfetsos, "Optimizing production in the Greek economy: Exploring the Interaction between Greenhouse Gas emissions and Solid Waste via Input-Output Analysis", Economic Systems Research, 24(1), p. 57-75, 2012.

J17. D. Hristu-Varsakelis and C. Kyrtsou " Testing for Granger Causality in the presence of Chaotic Dynamics", Brussels Economic Review, (53): 2, 2010, p. 323-327.

J16. D. Hristu-Varsakelis, S. Karagianni, A. Saraidaris "Equilibrium Conditions in Corporate Tax Competition and Foreign Direct Investment Flows", Economic Modeling, v. 28, (1-2), 2011, p. 13-21

J15. D. Hristu-Varsakelis, S. Karagianni, M. Pempetzoglou, T. Sfetsos " Optimizing Production with energy and GHG emission constraints in Greece: An Input-Output Analysis", Energy Policy, (38): 3, 2010, p. 1566-1577.

J14. S. B. Andersson, D. Hristu-Varsakelis, M. Lahijanian, "Observers in Language-Based Control", Communications in Information and Systems, v. 8, n. 2, p., 85-106, 2009.

J13. D. Hristu-Varsakelis, K. Chalkias, and G. Stephanides, "A Versatile Secure Protocol for Anonymous Timed-Release Encryption", Journal of Information Assurance and Security, vol. 3, no. 5, p. 80-89, June 2008.

J12. D. Hristu-Varsakelis, "Short-Period Communication and the Role of Zero-Order Holding in Networked Control Systems", IEEE Trans. Automatic Control, 53(5), p. 1285-1290, June 2008.

J11. D. Hristu-Varsakelis and C. Kyrtsou, "Evidence for Nonlinear Asymmetric Causality in US Inflation, Metal and Stock returns", Discrete Dynamics in Nature and Society, vol. 2008, Article ID 138547, May 2008.

J10. D. Hristu-Varsakelis and L. Zhang, "LQG Control of Networked Control Systems with Access Constraints and Delays", International Journal of Control, vol. 81, nr. 8, Aug. 2008, p. 1266-1280.

J9. D. Hristu-Varsakelis and C. Shao, "A Bio-Inspired Pursuit Strategy for Optimal Control with Partially-Constrained Final State", Automatica 43(7), pp. 1265-1273, July.

J8. C. Shao and D. Hristu-Varsakelis "Cooperative Optimal Control: Broadening the Reach of Bio-inspiration", Bioinspiration & Biomimetics 1(1), pp. 1-11, April 2006.

J7. S. Andersson and D. Hristu-Varsakelis, "Symbolic Feedback Control for Navigation", IEEE Transactions on Automatic Control vol. 51 (6), pp. 926-937, June 2006.

J6. L. Zhang and D. Hristu-Varsakelis, "Communication and Control Codesign for Networked Control Systems", Automatica, 42(6), pp. 953-958, June 2006.

J5. D. Hristu-Varsakelis and C. Shao, "Biologically-inspired optimal control: learning from social insects", *International Journal of Control*, vol. 77, no. 18, pp. 1549-1566, Dec. 2004.

J5b. D. Hristu-Varsakelis and C. Shao. "Corrections to: Biologically-inspired optimal control: Learning from social insects", Int'l Journal of Control, 78(2), pp. 157, Jan. 2005.

JOURNAL
ARTICLES
(CONTD)

J4. D. Hristu-Varsakelis and W. S. Levine, "An Undergraduate Laboratory for Networked Digital Control Systems", IEEE Control Systems Magazine, vol. 25, no. 1, pp. 60-62, Feb. 2005.

J3. D. Hristu-Varsakelis and R. W. Brockett, "Experimenting with Hybrid Control", IEEE Control Systems Magazine, vol. 22 (1), pp. 82-95, Feb. 2002.

J2. D. Hristu-Varsakelis, "The Dynamics of a Forced Sphere-Plate Mechanical System", IEEE Transactions on Automatic Control, 46 (5), pp. 678-687, Apr. 2001.

J1. D. Hristu and K. Morgansen, "Limited Communication Control", Systems and Control Letters, vol. 37 (4), pp. 193-204, Jul. 1999.

B. CONFERENCE
PROCEEDINGS

C34. N. Kostikis and D. Hristu-Varsakelis and M. Arnaoutoglou and C. Kotsavasiloglou, "Smartphone-based Evaluation of Movement Disorders: Quantitative Measurements vs Clinical Assessment Scores", IEEE Conf. on Engineering in Medicine and Biology, 2014.

C33. D. Hristu-Varsakelis, S. Karagianni, M. Pempetzoglou and A. Sfetsos, "Optimizing Production in Greece under Particulate Pollution Constraints with cross-Regional Transport Effects", in 14th Input-Output Conference, 2014.

C32. N. Goumagias and D. Hristu-Varsakelis, "A Markov-based Decision Model of Tax evasion by risk-averse firms in Greece", in Optimization Theory, Decision Making and Operations Research Application, Springer Proceedings in Mathematics v.31, (Proceedings of BALCOR 2011), 2012.

C31. D. Hristu-Varsakelis, S. Karagianni, M. Pempetzoglou, A. Sfetsos, "Regional optimization of air pollution in Greece via input-output analysis", Proc. XIX Int'l Input-Output Conference, June 2012.

C30. N. Kostikis, D. Hristu-Varsakelis, M. Arnaoutoglou, C. Kotsavasiloglou, and S. Baloyiannis, "Towards Remote Evaluation of Movement Disorders via Smartphones", IEEE Engineering in Medicine and Biology Confrence, 2011.

C29. D. Hristu-Varsakelis, S. Karagianni, M. Pempetzoglou, A. Sfetsos, "Optimizing Production in Greece under GHG emission reduction constraints: a comparison of objective functions", XVII Int'l Input-Output Conference, July 2009.

C28. K. Chalkias, F. Baldimtsi, D. Hristu-Varsakelis, G. Stephanides, "Mathematical Problems and Algorithms for Timed-Release Encryption", 9ème Colloque Franco-Roumain de Mathématiques Appliquées, Braşov, Romanie, 2008.

C27. K. Chalkias , F. Mpaldimtzi, D. Hristu-Varsakelis, and G. Stephanides, "An Implementation Infrastructure for Server-Passive Timed-Release Cryptography", Proc. of the Intl' Symposium on Information Assurance and Security (IAS), p. 89-94, 2008.

C26. K. Chalkias, D. Hristu-Varsakelis and G. Stephanides, "Improved Anonymous Timed-Release Encryption", Proc. of the 12th European Symposium On Research In Computer Security (ESORICS) LNCS Vol. 4734, pp. 311-326, Springer, 2007 (among 39 full papers accepted out of 164 submitted).

C25. D. Hristu-Varsakelis, K. Chalkias and G. Stephanides, "Low-cost Anonymous Timed-Release Encryption", Proc. of the Intl' Symposium on Information Assurance and Security (IAS), p. 77 - 82, 2007.

C24. K. Chalkias, F. Mpaldimtzi, D. Hristu-Varsakelis and G. Stephanides, "On the Key-Compromise Impersonation vulnerability of One-pass key establishment protocols", Int'l Conf. on Security and Cryptography (SECRYPT) 2007, pp.222-228. (Among the 26 best papers of ICETE 2007, out of 62 accepted from 418 submissions).

B. CONFERENCE PROCEEDINGS (CONT'D)

C23. D. Hristu-Varsakelis, "On the Period of Communication Policies for Networked Control Systems, and the Question of Zero-Order Holding", Proc. of the 46th IEEE Conf. On Decision and Control, pp. 38-43, 2007.

C22. K. Chalkias, S. T. Halkidis, D. Hristu-Varsakelis, G. Stephanides, and A. Alexiadis, "A Provably Secure One-Pass Two-Party Key Establishment Protocol", Information Security and Cryptology, 3rd International SKLOIS Conference, INSCRYPT, 2007, LNCS vol. 4990, p. 108-122, Springer, 2008 (among 33 papers accepted, out of 167 submissions).

C21. D. Hristu-Varsakelis, N. Samaras and C. Shao, "Local pursuit as a Bio-inspired Computational Optimal Control Tool", Proc. European Control Conference, pp. 4576-4583, Jul. 2007.

C20. D. Hristu-Varsakelis, "Stabilization of Networked Control Systems with Access Constraints and Delays", Proc. of the 45th IEEE Conference on Decision and Control, pp.1123-1128, Dec. 2006.

C19. W. S. Levine and D. Hristu-Varsakelis, "Some uses for Computer-Aided Control System Design Software in Control Education", IEEE Int'l Symposium on Computer-Aided Control Systems Design, pp. 2281-2285, Oct. 2006.

C18. L. Zhang and D. Hristu-Varsakelis, "LQG Control under Limited Communication", IEEE Int'l Conference on Decision and Control, σελ.185 – 190, Dec. 2005

C17. S. Andersson and D. Hristu-Varsakelis, "Language-based Feedback Control using Monte Carlo Sensing" , Proc. of the IEEE Int'l Conf. on Robotics and Automation 2005, pp. 3047-3052.

C16. C. Shao and D. Hristu-Varsakelis, "Biologically-inspired optimal control via intermittent cooperation", Proceedings of the 2005 American Control Conference, pp. 1060-1065, 2005.

C15. C. Shao and D. Hristu-Varsakelis, "Optimal control through biologically inspired pursuit", Proceedings of the 2005 IFAC World Congress, 2005.

C14. L. Zhang and D. Hristu-Varsakelis, "Stabilization of Networked Control Systems: Communication and Controller co-design", Proceedings of the 2005 IFAC World Congress, 2005 (Awarded the 2005 IFAC Young Author Prize).

C13. L. Zhang and D. Hristu-Varsakelis, "Stabilization of Networked Control Systems under Feedback-based Communication", Proceedings of the 2005 American Control Conference, pp 2933-2938, 2005.

C12. D. Hristu-Varsakelis, M. Egerstedt and P. S. Krishnaprasad, "On the Structural Complexity of the Motion Description Language MDLe", IEEE Conference on Decision and Control, pp. 3360-5, Dec. 2003.

C11. S. Andersson and D. Hristu-Varsakelis, "Stochastic Language-based Motion Control", IEEE Conference on Decision and Control, pp. 3313-8, Dec. 2003.

C10. M. Egerstedt and D. Hristu-Varsakelis, "Observability and Policy Optimization for Mobile Robots", IEEE Conference on Decision and Control, Dec. 2002, pp. 3596-3601

C9. D. Hristu-Varsakelis and P. R. Kumar, "Interrupt-based feedback control over a shared communication medium", IEEE Conf. on Decision and Control, Dec. 2002, pp. 3223-8.

B. CONFERENCE PROCEEDINGS (CONT'D)

C8. D. Hristu-Varsakelis, "Feedback Control Systems as Users of a Shared Network: Communication Sequences that Guarantee Stability". IEEE Conference on Decision and Control, Dec. 2001, pp. 3631-6 vol.4.

C7. D. Hristu-Varsakelis and S. Andersson, "Directed Graphs and Motion Description Languages for Robot Navigation and Control". IEEE Int'l Conference on Robotics and Automation, pp. 2689-94 vol.3, May 2002.

C6. D. Hristu-Varsakelis, "Robot Formations that Optimize their Paths on Uneven Terrain", IEEE Mediterranean Conference on Control and Automation, pp. 6, Jul. 2000.

C5. D. Hristu, N. Ferrier and R. W. Brockett, "The Performance of a Deformable Tactile Sensor: basic results on Geometrically-Motivated Tasks", IEEE Int'l Conference on Robotics and Automation, pp. 508-13 vol.1, May 2000.

C4. D. Hristu, "Stabilization of LTI systems with Communication Constraints", IEEE American Control Conference, pp. 2342-6, Jun. 2000.

C3. D. Hristu, "Generalized Inverses for Finite-horizon Tracking", IEEE Conference on Decision and Control, pp. 1397-1402, Dec. 1999.

C2. D. Hristu, D. Kontarinis and R. D. Howe, "A Comparison of Delay and Bandwidth Limitations in Tele-manipulation", Proc. Int'l Federation for Automatic Control, σελ. 331-6, Jun. 1996.

C1. D. Hristu, J. Babb, H. Singh and S. N. Gottschlich, "Position/Force Control of a Multi-fingered Hand: A Comparison of Fuzzy Logic to Traditional PID Control", IEEE Conference on Intelligent Robots and Systems, pp. 1391-8, 1994.

BOOK CHAPTERS

B2. D. Hristu-Varsakelis and W. S. Levine, "Control of Single-Input Single-Output Systems" , *Handbook of Networked and Embedded Control Systems*, Birkhauser, 2005, pp 21-34.

B1. D. Hristu-Varsakelis, "Feedback Control with Communication Constraints", *Handbook of Networked and Embedded Control Systems*, Birkhauser, 2005, pp 575-599.

TEACHING EXPERIENCE

UNIVERSITY OF MACEDONIA, DEPARTMENT OF APPLIED INFORMATICS, THESSALONIKI, GREECE

- *Decision Support Systems (Undergraduate), 2005-present*
Decision Theory, Utility theory, Markov Decision Processes and Dynamic Programming.

- *Operations Research (Undergraduate), Spring 2005-present.*
Constrained optimization, Lagrange multipliers, KKT conditions, Integer Programming.

- *Applied Mathematics I (Undergraduate), Fall 2012-2013.*
Introduction to Linear Algebra. Eigenvalues-Eigenvectors. Gauss Elimination, LU decomposition. Linear vector spaces, Gramm-Schmidt.

- *Applied Mathematics II (Undergraduate), Spring 2013-present.*
Sequences, Series, Convergence. Derivatives. Multi-variable optimization. Introduction to Linear differential and difference equations.

- *Optimization (Graduate), Fall 2014-present.*
Ellipsoid Algorithm, Scaling Techniques, Interior Point Methods, Exterior Point Algorithms. Introduction to Optimal Control. Calculus of Variations, LQR problems, Maximum Principle.

TEACHING EXPERIENCE (CONT'D)

- *Modeling and Decision-Making (Graduate), Spring 2015-present*
Advanced topics in mathematical modeling and decision making. Case studies drawn from a series of scientific fields such as bioinformatics, image processing, social networks, auctions, and tax policy optimization.

- *Scientific Computation (Graduate), Spring 2014.*
Numerical Computations, Precision and Accuracy, Error Analysis, Condition and Stability. Sparse problems. Solution of linear systems. Interpolation, Computational differentiation/integration. Runge-Kutta methods. Solution of two-point boundary value problems. Fourier transforms, FFT algorithm.

- *Computational Mathematics (Undergraduate), Fall 2005-Fall 2008*
Discrete mathematics and group theory, with applications to cryptography.

- *Information Technology Project Management (Undergraduate), Spring 2005-2012.*
IT project management and network analysis techniques.

- *Special Topics in Computational Mathematics (Undergraduate), Fall 2006-Fall 2009, 2013.*
Numerical solutions of stochastic differential equations, with application to option valuation.

- *Signal and Image Processing (Graduate), Fall 2006-2012.*
Image morphology, edge detection, applications of Fourier and Radon transforms, filtering, and basic stereo vision.

- *Decision Support Systems (Graduate), Fall 2006-2011.*
Decision theory, Markov decision processes, Utility theory, discrete time systems & the Kalman filter.

INTERNATIONAL HELLENIC UNIVERSITY, THESSALONIKI, GREECE

- *Decision Support Systems (Graduate), Fall 2010, 2011.*
Decision Theory, Utility theory, Games, Markov Decision Processes and Knowledge Discovery.

UNIVERSITY OF MARYLAND, COLLEGE PARK

- *ENME605 Advanced Systems Control, Fall 2000, 2001, 2002, 2004.*
Graduate course in linear systems theory. Department of Mechanical Engineering.

- *ENME462 Vibrations, control and optimization II, Fall 2003, Spring 2004.*
Senior-level course in control design.

- *ENME808H Distributed Systems: Control and Communication and Computation, Spring 2002.*
Graduate course on control of dynamical systems under communication and computation constraints. Department of Mechanical Engineering.

- *GEMS296,297,396, Fall 2003, Spring 2004, Fall 2004.*
Honors research sequence on novel ignition interlock technologies.

TEACHING EXPERIENCE (CONT'D)	**TEACHING FELLOW, HARVARD UNIVERSITY**

- *ES203 Stochastic Control, Spring 1998.*
Graduate-level course in stochastic processes and control systems. Division of Engineering and Applied Sciences.

- *ES202 Estimation and Control of Dynamic Systems, Fall 1996.*
Graduate-level course in linear systems theory. Division of Engineering and Applied Sciences.

- *ES51 Computer-aided Design Approach to Engineering, Spring 1995.*
Undergraduate course focusing on materials science, design of mechanisms and use of machining tools. Division of Engineering and Applied Sciences.

FELLOWSHIPS & AWARDS

Jury Prize (co-recipient), Division of Engineering and Applied Sciences, Harvard University, 1999.
ISR Post-doctoral Fellowship, 1999.
IFAC Young Author Prize (co-recipient), 2005.

CONTRACTS AND GRANTS

- PI, NSF CRCD: A curriculum in Networked Control Systems, $499,000 (includes $100,000 cost-sharing through the College of Engineering), 5/2001--2/2005.
- co-PI, AFOSR Dynamics and Control of Agile Formations, $486,000, 6/2001--12/2003.
- co-PI, ARO MURI Communicating Networked Control Systems. $5,000,000, 5/2001-- 4/2006.
PI, Minta Martin, Control and Communication in Swarms of Aerial Vehicles 7/2001 -- 5/2002, $54,000.

SERVICE & REVIEWING ACTIVITIES

- *Associate Editor*, IEEE Transactions on Automatic Control (2013-present).
- *Associate Editor*, IEEE Control Systems Society Conference Editorial Board, 2001-present.
- *Associate Editor*, Int'l Journal of Systems, Control and Communications (2007-present).
- Co-editor of the "Handbook of Networked and Embedded Control Systems", Birkhauser, Boston, Massachusetts, 2005.

- *Program Committee, American Control Conference 2007, Robocomm 2007.*
- *Member of the IFAC Technical Committee on Networked Systems (2005-2008).*
- *Reviewing activities for journals*: Automatica, IEEE Transactions on: Automatic Control, Circuits and Systems, Robotics and Automation, Systems Man and Cybernetics; SIAM Journal on Control and Optimization; AIAA; Optimal Control Applications and Methods; Systems and Control Letters; Journal of the Franklin Institute.
- *Other reviewing activities*: IEEE Conference on Decision and Control, American Control Conference, IEEE Int'l Conference on Robotics and Automation, IEEE Conference on Control Applications, ASME Dynamic Systems and Control.