Matthew M. Peet, curriculum vitae

CONTACT INFORMATION

Matthew M. Peet
Arizona State University
School for Engineering of Matter, Transport and Energy
P.O. Box 876106
Tempe, AZ 85287-6106

Voice: 1-312-567-3220
Mobile: +1-630-272-4451
E-mail: mpeet@asu.edu
WWW: control.asu.edu

NATIONALITY

United States Citizen

RESEARCH AREA

Computational Aspects of Control

RESEARCH INTERESTS

I work to understand the role of computation in solving intractable control problems. I work on problems in energy, biology and information networks.

EDUCATION

Stanford University, Stanford, California USA

Ph.D., Aeronautics and Astronautics, March, 2006

- Dissertation Topic: "Stability and Control of Functional Differential Equations"
- Thesis Advisor: Sanjay Lall
- Thesis Committee: Geir Dullerud, Stephen Rock, Günter Niemeyer

Stanford University, Stanford, California USA

M.S., Aeronautics and Astronautics, June, 2001

University of Texas at Austin, Austin, Texas USA

B.S., Aerospace Engineering, December, 1999
B.S., Physics, June, 1999

RESEARCH EXPERIENCE

Arizona State University **2012 - present**
School for Engineering of Matter, Transport and Energy,
Assistant Professor of Aerospace Engineering

I am responsible for teaching and directing graduate-level research in the Cybernetic Systems and Controls Laboratory. The core goal of our lab is to understand how computation can be used to control complicated dynamics. One application of our research, supported by the French government, is control of plasma in Tokamak fusion energy reactors. This research builds on methods we have developed (funded by NSF CAREER) to use Sum-of-Squares to synthesize verifiable observer-based controllers for spatially-distributed systems such as high-energy plasma. This work is in collaboration with DIII-D facility in the U.S. and the Tore Supra facility in France. Another topic is understanding the role of communication and feedback in the immune system. We investigate the interactions of T cells, dendritic cells, cytokines and other species in order to model the decision process involved in immune response. By priming dendritic and regulatory cell populations, we can potentially improve treatment of both autoimmune and infectious disease. This project is in collaboration with the Stanford Medical Center. Additionally, with support from NSF, we are developing new massively decentralized algorithms for robust analysis and optimal controller synthesis problems in systems with parametric uncertainty. By using cluster and super-computing resources at IIT and Argonne, this research has already provided an order of magnitude increase (100+ states) in the size of the models which we can control.

Illinois Institute of Technology **2008 - 2012**
Department of Mechanical, Materials and Aerospace Engineering,
Assistant Professor of Aerospace Engineering

National Institute for Research **2007 - 2008**
in Computer Science and Control (INRIA), Rocquencourt, France
Nonlinear Analysis for Biology and Geophysical flows (BANG) ARC ModLMC
Postdoctoral Researcher

My second second year INRIA focused on work with ARC ModLMC - a collaboration of researchers at INRIA, INSERM, CNRS, and the universities of Lyon and Bordeaux, including hematologists and applied mathematicians - in order to develop and analyze new models of cancer-related diseases and in particular ChronicMyelogenous Leukemia(CML). My primary research topic was the development and analysis of models for the occurrence of the blast crisis, by which CML becomes AML (Acute Myelogenous Leukemia). We viewed the blast crisis as a loss of stability of the underlying nonlinear delay-differential model. From this perspective therapeutic treatment and prognosis can be studied using algorithmic approaches to stability. In collaboration with theorists and clinicians at the hospital HOTEL-DIEU, we developed models of patient response using both biological principles and numerical data.

National Institute for Research **2006 - 2007**
in Computer Science and Control (INRIA), Rocquencourt, France
SIgnals and SYstems in PHysiology & Engineering (SISYPHE)
Postdoctoral Research Fellow
During my first postdoc at INRIA, I worked on the use of Sum-of-Squares algorithms for analysis of systems with nonlinearity and delay. During this time, we developed the SOS method for stability analysis of delayed linear systems. This SOS method has since largely displaced other LMI methods for stability analysis of linear time-delay systems. One of the other interesting research areas developed during this period was a set of converse SOS Lyapunov results for nonlinear systems and delayed systems. This result showed that Sum-of-Squares algorithms converge as the polynomial degree increases.

Networked Systems and Controls Laboratory, Stanford, California **2002 - 2006**
Stanford University Advisor: Sanjay Lall
Research Assistant
My doctoral research focused on the ability of communication networks to handle nonlinearity and delay. In my work on optimization-based control of networks, I studied the proposed FAST TCP using a hybrid, nonlinear, time-delayed model of the Internet. Using a technique known as analysis via Integral Quadratic Constraints (IQC), I was able to prove convergence of the protocol, giving necessary and sufficient conditions for stability. Additionally, during this period, I begin my work on Sum-of-Squares algorithms for stability analysis of nonlinear systems with delay using semidefinite programming. Implementations of these algorithms are now available online.

SuperNova Acceleration Probe (SNAP) project, Berkeley, California **2000 - 2001**
Lawrence Berkeley National Laboratory
Research Assistant
I worked on developing a lunar gravity-assist trajectory for the Supernova/Acceleration Probe (SNAP). I developed a prototype algorithm for the construction of lunar gravity assist trajectories for the purpose of evaluation of cost and feasibility.

Gravity Probe B, Stanford, California **2000 - 2001**
Stanford University
Research Assistant
I performed analysis of the orbital configuration of the GPS satellite constellation to determine optimal antenna design and orientation. Presented results to engineers and to the 2001 GPS III conference in Phoenix.

Johnston Space Center, Clear Lake, Texas **1998 - 1999**
Lockheed Martin Space Operations Corp. Flight Dynamics Planning and Analysis Group
Applications Engineer
Developed flight dynamics software for the International Space Station. Programmed orbital dynamics simulators using ADA and MatrixX. Improved graphical interfaces using GPip and PVWave. Participated in design review and inspection process. Worked on testing and implementation of software.

Applied Research Laboratories, Austin, Texas **1997 - 1998**
Department of Defense
Undergraduate Researcher

Fusion Research Center, Austin, Texas **1996 - 1997**
University of Texas at Austin
Undergraduate Researcher

Courses Taught

PAUT54A1: MiniCourse on LMI and SOS Methods in Control A 16.5 hour course on the basics of modern optimal control theory, with an emphasis on convex optimization and Linear Matrix Inequalities. Mathematical Analysis; Linear Systems Theory; H-infinity and H-2 optimal control using LMI formulations; Nonlinear Systems; Converse Lyapunov Theory; Sum-of-Squares; Semialgebraic Geometry; Optimization and Duality. Texts: None. ***Lecture Slides.*** Taught: Spring, 2013 at the University of Grenoble.

MAE 462: Space Vehicle Dynamics and Control A upper-division undergraduate class on orbital mechanics and attitude dynamics. Orbital Invariants; Elliptic, Parabolic and Hyperbolic Orbits; Conversion to/from Orbital Elements; Hohman Transfer; Bi-elliptic Transfer; Lambert's Problem; The rocket equation; Effect of drag; Effect of non-spherical Earth; Special Orbits; Interplanetary mission planning; Attitude Control Systems; Euler's equations; Stability of Torgue-free motion. ***Lecture Slides:*** Original slides with illustrations, movies, and embedded multimedia. Texts: Prussing/Conway. ***Lecture Slides.*** Taught: Spring, 2013 at ASU.

MAE 507: Modern Control Systems An advanced graduate course on the fundamentals of computational control. No prerequisite. Closely follows the text by Dullerud and Paganini. feedback control; vector spaces; convexity; singular value decomposition; LMIs; state-space systems; controllability and observability; linear analysis and frequency-domain spaces; the Lyapunov equation; full-state feedback; output feedback; optimal control. ***Lecture Slides.*** Texts: A Course in Robust Control Theory: A Convex Approach by Dullerud and Paganini. Taught: Spring, 2013 at ASU.

MAE 318: Systems Analysis and Control A lower-division course on on dynamical systems analysis and controller design. Linearization; Laplace and Fourier Transform; Transfer Functions; Block Diagrams; Routh-Hurwitz criterion; Performance Specifications; P, PD, and PID control; Root Locus; Lead-Lag Compensators; Bode Plots; Nyquist Criterion. ***Lecture Slides***. Text: Franklin, Powell and Emami; Taught: Fall, 2013 at ASU (4.3/5).

MMAE 441: Spacecraft and Aircraft Dynamics A senior-level undergraduate class on the basics of flight dynamics and orbital mechanics. Kinematics and dynamics of particles, systems of particles, and rigid bodies; translating and rotating reference frames; Euler angles; aircraft longitudinal and lateral stability; aircraft nonlinear and linearized equations of motion; Spacecraft orbital mechanics; two-body problem; classical orbital elements; orbital maneuvers; interplanetary trajectories. ***Lecture Slides:*** Over 700 original slides with over 500 illustrations, movies, and embedded multimedia. Texts: Etkin/Reid, Vallado. Taught: Fall, 2008; Fall, 2010 (4.2/5).

MMAE 543: Modern Control Systems An advanced graduate course on the fundamentals of computational control. No prerequisite. Closely follows the text by Dullerud and Paganini. feedback control; vector spaces; convexity; singular value decomposition; LMIs; state-space systems; controllability and observability; linear analysis and frequency-domain spaces; the Lyapunov equation; full-state feedback; output feedback; optimal control. ***Lecture Slides:*** Texts: A Course in Robust Control Theory: A Convex Approach by Dullerud and Paganini. Taught: Spring, 2009; Spring, 2010; Fall, 2011.

MMAE 443: Systems Analysis and Control A senior-level undergraduate class on dynamical systems analysis and controller design. Block Diagrams; Linearization; State-Space; Laplace and Inverse Laplace Transform; Transient Response Characteristics; P, PD, and PID control; Stability; Root Locus; Bode Plots; Nyquist Diagrams; Lead-Lag Compensation; Notch filters. ***Lecture Slides***. Text: Franklin, Powell and Emami; Taught: Fall, 2009; Spring, 2010; Spring, 2011 - 2 sections; Fall, 2011; Spring, 2012

Awards and Pending Proposals

- **Brasilian and French Governments (FAPESP and ANR)**, *Parameter-dependent semidefinite programming in robust control. Application to analysis of dynamical system interaction networks.* Role: Co-PI; Amount/Duration: 20,000 euro / 2006-2008 Status: **FUNDED**
- **IIT International Undergraduate Student Research Program** *Computational Control of*

the Vibration Equation. Role: Sole PI; Amount: $1,500; Dates: 06/01/2011 - 08/14/2011; Status: **FUNDED**.

- **French Consulate (Chateaubriand Program)** *Output and State Feedback Stabilization of Distributed Parameter Systems using Sum of Squares Polynomials and its Application to Nuclear Fusion* Role: Sole PI; Amount: expensed (6 mo./year tuition + $2400/mo stipend + travel expenses); Dates: 09/1/2011 - 8/31/2013; Status: **FUNDED**.
- **NSF CMMI-1100376** *Solving Large Sum-of-Squares Optimization Problems in Control by Exploiting the Parallel Structure of Polya's Algorithm* Role: Sole PI; Amount: $237,473; Dates: 9/1/2011-8/31/2014; Status: **FUNDED**.
- **NSF CAREER CMMI-1301851** *A New Computational Framework for Control of Complex Systems* Program: Control Systems; Role: Sole PI; Amount: $400,000; Dates: 01/1/2012 - 12/31/2016; Status: **FUNDED**.
- **NSF** *Creating a Scalable Parallel Computing Framework for Nonlinear Stability and Control via SOS and Semialgebraic Geometry*; Role: PI; Requested Amount: $273,536; Submitted: 10/01/2013; Status: Pending;
- **DOE** *CAREER: Using Advanced Computational Methods in Systems and Controls Theory for Diagnostics and Control of Plasma in Tokamak Reactors*; Role: PI; Requested Amount: $750,000; Submitted: 11/26/2013; Status: Pending;

Current Graduate Students

Evgeney Meyer, PhD student	**2013 - present**
Jacob Unna, PhD student	**2013 - present**
Bin Li, PhD student (Dean's Scholar)	**2011 - 2013**
Reza Kamyar, PhD student	**2010 - present**
Chaitanya Murti, MS student	**2010 - 2012**
Aditya Gahlawat, PhD student (Chateaubriand Fellow)	**2009 - 2013 (exp.)**

Software

SOSCode, S. Lall, M. Peet, and T. Wang. A self-contained Matlab toolbox for the efficient construction of sum-of-squares programming problems.

DelayTools/Linear, M. Peet. A set of Matlab functions and files for the analysis on n-dimensional linear systems with m discrete delays. Separate files handle the deterministic and generalized uncertainty cases separately. Available for download from: `http://control.asu.edu/software`

DelayTools/Nonlinear, M. Peet. A set of Matlab functions and files for the analysis on n-dimensional nonlinear polynomial systems with m discrete delays. Separate files handle the deterministic and generalized uncertainty cases separately. Available for download from: `http://control.asu.edu/software`

DelayTools/Complex, M. Peet. A number of matlab toolbox functions for analysis of transfer functions in the frequency domain using SOS and positivstellensatz techniques. Scripts test quasiploynomial transfer functions for both delay-independant and delay-dependant H_∞ stabiltiy and delay-independent exponential stability. The delay-dependent test is based on the paper by Zhang et al. Available for download from: `http://control.asu.edu/software`

Professional Activities

- University Service: Computing Committee (2008-2010). Undergraduate Research (2010-2011) Computing Coordinator (2010-2011). Undergraduate Studies Committee (2010-2011).
- Funding Evaluation Panels: United States National Science Foundation; Icelandic Research Fund; Romanian Joint Applied Research Projects - PCCA; South African National Research Foundation.
- IEEE Technical Committee on Power Generation Control
- IEEE Technical Committee on Systems with Uncertainty
- International Program Committee: IEEE Multi-Conference on Systems and Control. Hyderabad, India, 2012; IEEE Multi-Conference on Systems and Control. Denver, CO, 2011;
- Technical Committee: 3rd International Conference on Control and Optimization with Industrial Applications. Bilkent University, Turkey, 2011.

- International Program Committee: Seventh International Conference on Mathematical Problems in Engineering, Aerospace and Sciences. Genoa, Italy, 2008;
- Organized Workshops: Workshop on Time-Delay Systems at IFAC World Conference, 2008; Workshop on Uncertain Systems at the IEEE Multi-Conference on Systems and Controls, 2010;
- Organizer and Chair: Invited Session on "Computational Methods for Nonlinear and Time-Delay Systems" at Seventh International Conference on Mathematical Problems in Engineering, Aerospace and Sciences. Genoa, Italy, 2008;
- Chair: "Delay Systems 2", at the Mathematical Theory of Networks and Systems. Blacksburg, VA, 2008.
- Co-Chair, "Time Delay Uncertain Systems", at the 45th IEEE Conference on Decision and Control, 2006.
- Reviewer: IEEE Transactions on Automatic Control (22); Automatica (29); IEEE/CSS Conference on Decision and Control 2006, 2008, 2009, 2011, 2012 (16); IFAC Workshop on Time-Delay Systems 2006, 2010, 2012 (8); IMA Journal on Mathematics Control Information (7); IEEE Transactions on Circuits and Systems - I (7); American Control Conference 2010, 2011, 2012 (6); IFAC World Congress 2008, 2001 (5); Systems and Controls Letters (3); Journal of Mathematical Analysis and Applications (3); International Journal of Control (3); ACM SIGCOMM Computer Communication Review (3); Mathematical Biosciences (2); AMS Math Reviews (2); International Journal of Robust and Nonlinear Control (2); Journal of Systems Science and Systems Engineering (1); European Journal of Control (1); Journal of the Franklin Institute (2); Linear Algebra and Its Applications (1); IET Control Theory and Applications (2); Control Engineering Practice (1); Southwest Symposium on Systems and Control (1); Conference on Control and Optimization with Industrial Applications(1); ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (1); ASME Journal of Dynamic Systems, Measurements and Control (1); AIAA Journal on Guidance, Control and Dynamics (1); International Conference on Systems and Computer Science 2012 (1); POPL 2013: ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (1).
- Member: IEEE, AIAA, SIAM, SMAI

Recognition

- 1994: National Merit Scholar;
- 1995: Dedman Merit Scholar;
- 1995: Sigma Gamma Tau Aerospace Engineering Honor Society;
- 1995: Tau Beta Pi Engineering Honor Society;
- 1999: Graduated Cum Laude, The University of Texas at Austin.;
- 2001: Boeing Graduate Fellow. ;
- 2006: INRIA (French) Postdoctoral Fellow.;
- 2011: NSF CAREER recipient.;

Journal Publications

A. Gahlawat and M. Peet *A Sum-of-Squares Approach to H_∞-optimal control of PDE Systems.* Submitted to IEEE Transactions on Automatic Control.

R. Kamyar, M. Peet and Y. Peet *Solving Large-Scale Robust Control Problems by Exploiting the Parallel Structure of Polya's Theorem.* IEEE Transactions on Automatic Control. Vol. 58, No. 8, Aug., 2013.

A. Seuret and M. Peet. *Stability analysis of sampled-data systems using Sum of Squares.* IEEE Transactions on Automatic Control. Vol. 58, No. 6, June, 2013.

M. Peet and A. Papachristodoulou *A Converse Sum of Squares Lyapunov Result with a Degree Bound.* IEEE Transactions on Automatic Control. Vol 57, No. 9, Sept., 2012. Full Paper.

Y. Zhang, M. Peet and K. Gu. *Reducing the Complexity of the Sum-of-Squares Test for Stability of Delayed Linear Systems.* IEEE Transactions on Automatic Control. Vol 56, No. 1, 2011.

M. M. Peet and P.-A. Bliman. *On the Conservatism of the Sum-of-Squares Method for Analysis of Time-Delayed Systems.* Automatica. Vol 49, No. 11, Nov. 2011.

M. M. Peet. *Exponentially Stable Nonlinear Systems have Polynomial Lyapunov Functions on Bounded Regions.* IEEE Transactions on Automatic Control, Vol. 54, No. 5, May 2009. Full Paper.

A. Papachristodoulou, M. Peet and S. Lall *Analysis of Polynomial Systems with Time Delays via the Sum of Squares Decomposition.* IEEE Transactions on Automatic Control. Vol. 54, No. 5, May 2009.

M. M. Peet, P. Kim, S.-I. Niculescu, and D. Levy *New Computational Tools for Modeling Chronic Myelogenous Leukemia* Mathematical Modeling of Natural Phenomena, Vol. 4, No. 2, 2009. Full Paper.

M. M. Peet, A. Papachristodoulou and S. Lall. *Positive Forms and Stability of Linear Time-Delay Systems.* SIAM Journal on Control and Optimization. Vol. 47, No. 6, pp. 3237-3258, 2009. Full Paper.

M. Peet and S. Lall. *Global Stability Analysis of a Nonlinear Model of Internet Congestion Control with Delay.* IEEE Transactions on Automatic Control. Vol. 52, No. 3, March 2007.

Book Chapters

M. M. Peet and A. Seuret. *Global Stability Analysis of Nonlinear Sampled-Data Systems Using Convex Methods.* in "Delay Systems: From Theory to Numerics and Applications", Springer, 2013.

Y. Zhang, M. Peet and K. Gu. Chapter *Accelerating Convergence of Sum-of-Square Stability Analysis of Coupled Differential-Difference Equations.* In "Time Delay Systems - Methods, Applications and New Trends" Springer Lecture Notes in Control and Information Science. Vol. 423. January 2012.

M. M. Peet, C. Bonnet, and H. Ozbay. Chapter *SOS Methods for Stability Analysis of Neutral Differential Systems.* Springer Lecture Notes in Control and Information Science, vol. 388. October, 2009.

A. Papachristodoulou and M. Peet. Chapter *SOS Methods for Nonlinear Delayed Models in Biology and Networking.* Springer Lecture Notes in Control and Information Science, vol. 388. October, 2009.

Tutorial Sessions

M. M. Peet. *Using SOS for Analysis and Control of Delayed and Infinite-Dimensional Systems.* IEEE Multi-Conference on Systems and Control. Kyoto, Japan, Sept. 2010;

M. M. Peet and U. Munz *Using SOS for analysis of Networked Control Systems.* IFAC World Congress, Seoul, Korea. July 6 - 11, 2008.

CSI-Indexed Peer-Reviewed Conference Papers

M. Peet *LMI Parameterization of Lyapunov Functions for Infinite-Dimensional Systems: A Toolbox.* Submitted to the American Control Conference, 2014.

R. Kamyar and M. Peet *Decentralized Polyas Algorithm for Stability Analysis of Large-scale Nonlinear Systems.* 52nd IEEE Conference on Decision and Control. Florence, IT. December 10-13, 2013.

B. Li and M. M. Peet. *Stability Analysis of State-Dependent Delay Systems using Sum-of-Squares.* AIAA Conference on Guidance, Navigation and Control. Boston, MA. Aug. 19-22, 2013.

C. Murti and M. Peet. *A Sum-of-Squares Approach to the Analysis of Zeno Behavior in Hybrid Dynamical Systems.* European Control Conference. Zurich, CZ. July 17-19, 2013.

M. Peet. *Full-State Feedback of Delayed Systems using SOS: A New Theory of Duality.* 11th IFAC Workshop on Time-Delay Systems. Grenoble, France. Feb. 4-6, 2013.

R. Kamyar and M. Peet. *Decentralized Computation for Robust Stability of Large-scale Systems with Parameters on the Hypercube.* 51st IEEE Conference on Decision and Control, Maui, HI. Dec. 10-13, 2012.

A. Gahlawat, E. Witrant, M. Peet and M. Alamir. *Bootstrap Current Optimization in Tokamaks Using Sum-of-Squares Polynomials.* 51st IEEE Conference on Decision and Control, Maui, HI. Dec. 10-13, 2012.

R. Kamyar and M. Peet. *Solving Large-Scale Robust Control Problems by Exploiting the Parallel Structure of Polya's Theorem.* Proceedings of the American Control Conference. Montreal, Canada. June 27 - 29.

A. Gahlawat and M. Peet. *Designing Observer-Based Controllers for PDE systems: A Heat-Conducting Rod With Point Observation and Boundary Control.* 50th IEEE Conference on Decision and Control, Orlando, FL. Dec. 12-15, 2011.

M. Peet, P. Kim and P. Lee. *Biological Circuit Models of Immune Regulatory Response: A Decentralized Control System.* 50th IEEE Conference on Decision and Control, Orlando, FL. Dec. 12-15, 2011.

A. Seuret and M. Peet. *SOS for Sampled-Data Systems.* Proceedings of the IFAC World Congress. Milan, Italy. Aug. 28-Sept. 2, 2011.

A. Gahlawat, M. Peet and E. Witrant. *Control and Verification of the Safety-Factor Profile in Tokamaks Using Sum-of-Squares Polynomials.* Proceedings of the IFAC World Congress. Milan, Italy. Aug. 28-Sept. 2, 2011.

M. M. Peet *A Converse Sum-of-Squares Lyapunov Result: An Existence Proof Based on the Picard Iteration.* 49th IEEE Conference on Decision and Control, Atlanta, GA. Dec. 15-17, 2010.

Y. Zhang, M. Peet and K. Gu. *Reducing the Computational Cost of the Sum-of-Squares Stability Test for Time-Delayed Systems.* Proceedings of the American Control Conference. Baltimore, MD. June 30 - July 2, 2010.

M. M. Peet and Y. V. Peet. *A Parallel-Computing Solution for Optimization of Polynomials.* Proceedings of the American Control Conference. Baltimore, MD. June 30 - July 2, 2010.

M. M. Peet *A Bound on the Continuity of Solutions and Converse Lyapunov Functions.* 48th IEEE Conference on Decision and Control, Shanghai, China. Dec. 16-18, 2009.

M. M. Peet and A. Papachristodoulou *Using Polynomial Semi-Separable Kernels to Construct Infinite-Dimensional Lyapunov Functions.* Invited Session on Infinite-Dimensional Systems, 47th IEEE Conference on Decision and Control, Cancun, Mexico. December 9-11, 2008.

A. Papachristodoulou and M. M. Peet. *Global Stability Analysis of Primal Internet Congestion Control Schemes with Heterogeneous Delays.* IFAC World Congress, Seoul, Korea. July 6 - 11, 2008.

M. M. Peet and P.-A. Bliman. *Polynomial Lyapunov Functions for Exponential Stability of Nonlinear Systems on Bounded Regions.* IFAC World Congress, Seoul, Korea. July 6 - 11, 2008.

A. Papachristodoulou, M. M. Peet and S.-I. Niculescu. *Stability Analysis of Linear Systems with Time-Varying Delays: Delay Uncertainty and Quenching.* 46th IEEE Conference on Decision and Control, New Orleans, LA. December 12-14, 2007. pp. 2117-2122

M. M. Peet and A. Papachristodoulou. *Positivity of Kernel Functions for Systems with Communication Delay.* 46th IEEE Conference on Decision and Control, New Orleans, LA. December 12-14, 2007. pp. 2815-2820

M. Peet, A. Papachristodoulou and S. Lall. *Positive Forms and Stability of Linear Time-Delay Systems.* Proceedings of the 45th IEEE Conference on Decision and Control, pp. 187-193 December 2006. **(Best Paper in Session)**

A. Papachristodoulou and M. M. Peet. *On the Analysis of Systems Described by Classes of Partial Differential Equations*. Proceedings of the 45th IEEE Conference on Decision and Control, pp. 747-752, December 2006.

A. Papachristodoulou, M. Peet and S. Lall. *Constructing Lyapunov-Krasovskii Functionals for Linear Time Delay Systems*. Proceedings of the American Control Conference, pp. 2845-2850, June 2005.

M. Peet and S. Lall. *On Global Stability of Internet Congestion Control*. Proceedings of the 43rd IEEE Conference on Decision and Control, pp. 1035-1041, December 2004.

Other Peer-Reviewed Conference Papers

Y. Zhang, M. Peet and K. Gu. *Accelerating Convergence of Sum-of-Square Formulation for Lyapunov-Krasovskii Stability Analysis of Coupled Differential-Difference Equations*. 9th IFAC Workshop on Time-Delay Systems. Prague, Czech Republic. June 7 - 9, 2010.

M. M. Peet and A. Papachristdoulou. *Inverses of Positive Linear Operators and State Feedback Design for Time-Delay Systems*. 8th IFAC Workshop on Time-Delay Systems. Sinaia, Romania. Sept. 1-3, 2009. To Appear.

M. M. Peet, H. Özbay and C. Bonnet *SOS Methods for Delay-Dependent Stability of Neutral Differential Systems*. Mathematical Theory of Networks and Systems, Blacksburg, VA. July 28 - Aug. 1, 2008.

M. M. Peet and P.-A. Bliman. *The Weierstrass Approximation Theorem on Linear Varieties: Polynomial Lyapunov Functionals for Delayed Systems*. Mathematical Theory of Networks and Systems, Blacksburg, VA. July 28 - Aug. 1, 2008.

M. M. Peet. *Exponentially Stable Nonlinear Systems have Polynomial Lyapunov Functions on Bounded Regions*. 45th Annual Allerton Conference on Communication, Control and Computing. Monticello, IL. Sept. 26-28, 2007.

C. Bonnet and M. M. Peet. *Using the Positivstellensatz for Stability Analysis of Neutral Delay Systems in the Frequency Domain*. 7th IFAC Workshop on Time-Delay Systems. Nantes, France. Sept. 17-19, 2007.

M. M. Peet and P.-A. Bliman. *An Extension of the Weierstrass Theorem to Linear Varieties: Application to Delayed Systems*. 7th IFAC Workshop on Time-Delay Systems. Nantes, France. Sept. 17-19, 2007.

M. M. Peet and C. Bonnet. *Stability and Computation of Roots in Delayed Systems of Neutral Type*. IFAC Workshop on Control of Distributed Parameter Systems. Namur, Belgium. June 22-27, 2007.

M. M. Peet. *On Positive Quadratic Forms and Stability of Linear Systems*. Conférence de la SMAI sur l'optimisation et la décision. April, 2007.

M. Peet and S. Lall. *Constructing Lyapunov Functions for Delay-Differential Equations using Semidefinite Programming*. Proceedings of the 6th IFAC Symposium on Nonlinear Control Systems (NOLCOS), pp. 381-381, August 2004.

Invited Seminars and Conference Presentations

AIAA Conference on Guidance, Navigation and Control. Boston, MA. August, 2013;

Los Alamos National Laboratory, Los Alamos, NM. August, 2013;

Los Alamos National Laboratory, Los Alamos, NM. August, 2013;

Workshop on Algorithms for Dynamical Systems and Lyapunov Functions, Reykjavik, Iceland. July, 2013;

The University of Michigan, Ann Arbor, MI. February, 2013;

New York University, New York, NY. December, 2012;

Otto-von-Guericke University Magdeburg, Magdeburg, Germany. November, 2012;

Institute Joseph Fourier, Grenoble, France. November, 2012;

The University of Oxford, Oxford, UK. November, 2012;

American Control Conference. Montreal, Canada. Present Paper FrB20.4. June 29, 2012.;

The University of Texas at El Paso. El Paso, TX. March, 2012.

Arizona State University. Tempe, AZ. February, 2012.

City of Hope Medical Center. Beckman Research Institute. Duarte, CA. February, 2012.

Georgia Institute of Technology. Atlanta, GA. February, 2012.

Illinois Institute of Technology. Chicago, IL. January, 2012.

Argonne National Laboratory. LANS Informal Seminar. Mathematics and Computer Science Division. Lemont, IL. January, 2012.

IEEE Conference on Decision and Control. Present Paper: TuB02.3, December 2011.

IEEE Conference on Decision and Control. Present Paper: ThA17.3, December 2011.

IFAC World Congress. Present Paper. Milan, Italy. September, 2011.

Texas A&M University. College Station, TX. March, 2011.

Lehigh University. Bethlehem, PA. February, 2011.

The University of California. Berkeley, CA. February, 2011.

Stanford University. Stanford, CA. January, 2011.

IEEE Conference on Decision and Control. Present Paper: FrA20.5, December 2010.

University of Notre Dame. South Bend, IN. Oct. 14, 2010.

American Control Conference. Baltimore, MD. Present Paper FrA05.2. July 2, 2010.

American Control Conference. Baltimore, MD. Present Paper FrA09.6. July 2, 2010.

University of Oxford. Oxford, UK. June 16, 2010.

University of Grenoble. Grenoble, France. June 11, 2010.

IFAC Worskhop on Time-Delay Systems. Present Paper. June 8, 2010.

University of Minnesota. Minneapolis-St. Paul, MN. April 19, 2010.

University of Utah. Salt Lake City, UT. March 31, 2010.

IEEE Conference on Decision and Control. Present Paper: ThA01.4, December 2009.

8th IFAC Workshop on Time-Delay Systems. Present Paper. Sinaia, Romania. Sept., 2009.

Stanford University. Stanford, CA. May, 2009.

The University of Southern Illinois. Eduardsville, IL. February, 2009.

IEEE Conference on Decision and Control. Present Paper: TuB07.3, December 2008.

University of Illinois at Urbana-Champaign. Coordinated Systems Laboratory. Champaign, IL. October, 2008.

Conference on Mathematical Theory of Networks and Systems. Paper Presentation: RSAlgGeo.2 . Blacksburg, Virginia. July, 2008.

Conference on Mathematical Theory of Networks and Systems. Paper Presentation: RSDelay2.1 . Blacksburg, Virginia. July, 2008.

IFAC World Congress. Pre-conference Workshop: WS7, Seoul, South Korea. July, 2008.

IFAC World Congress. Present Paper: MoB02.2, Seoul, South Korea. July, 2008.

IFAC World Congress. Present Paper: MoC14.5, Seoul, South Korea. July, 2008.

European Conference on Mathematical and Theoretical Biology. Edinburgh, U.K., June 29th - July 4th, 2008.

ICNPAA 2008: Mathematical Problems in Engineering, Aerospace and Science. Genoa, Italy. June, 2008.

LAAS, Groupe de Travail EDP - GDR MACS. Toulouse, France. June, 2008.

State University of Campinas, School of Electrical and Computer Engineering. Campinas, Brasil. June, 2008.

Katholieke Universiteit Leuven, Department of Electrical Engineering, OPTEC Group. Leuven, Belgium. May, 2008.

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