

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	<i>Voice:</i> 1-312-567-3220 <i>Mobile:</i> 1-630-272-4451 <i>E-mail:</i> mpeet@asu.edu <i>WWW:</i> control.asu.edu
NATIONALITY	United States Citizen	
RESEARCH FOCUS	Fundamental Advances in Control and Optimization	
EDUCATION	Stanford University , Stanford, California USA Ph.D., Aeronautics and Astronautics, March, 2006 <ul style="list-style-type: none">• Dissertation Title: “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 Full Scholarship Averaged 8.3 classes/22.5 credits per semester for 4.5 years. B.S., Aerospace Engineering, December, 1999 B.S., Physics, June, 1999 Graduated with honors	
PROFESSIONAL EXPERIENCE	Arizona State University School for Engineering of Matter, Transport and Energy , <i>Associate Professor of Mechanical and Aerospace Engineering</i>	2016-
	Arizona State University School for Engineering of Matter, Transport and Energy , <i>Assistant Professor of Mechanical and Aerospace Engineering</i>	2012 - 2016
	Illinois Institute of Technology Department of Mechanical, Materials and Aerospace Engineering , <i>Assistant Professor of Aerospace Engineering</i>	2008 - 2012
	National Institute for Research in Computer Science and Control (INRIA) , Rocquencourt, France Nonlinear Analysis for Biology and Geophysical flows (BANG) <i>Postdoctoral Scholar</i> Description: Postdocs at INRIA have autonomy. However, this second term was focused on collaboration with the BANG group.	2007 - 2008 ARC ModLMC
	National Institute for Research in Computer Science and Control (INRIA) , Rocquencourt, France Signals and SYstems in PHysiology & Engineering (SISYPHE) <i>Postdoctoral Scholar</i> Description: Postdocs at INRIA have autonomy. However, this second term was focused on collaboration with the SISYPHE group.	2006 - 2007
	Networked Systems and Controls Laboratory , Stanford, California Stanford University <i>Research Assistant</i>	2002 - 2006 Advisor: Sanjay Lall

SuperNova Acceleration Probe (SNAP) project , Berkeley, California Lawrence Berkeley National Laboratory <i>Research Assistant</i> Description: Development of a lunar gravity-assist trajectory for the Supernova/Acceleration Probe (SNAP). Supervision by Doron Levy.	2000 - 2001
Gravity Probe B , Stanford, California Stanford University <i>Research Assistant</i> Description: Design of the GPS III constellation constellation.	2000 - 2001
Johnston Space Center , Clear Lake, Texas Lockheed Martin Space Operations Corp. Flight Dynamics Planning and Analysis Group <i>Applications Engineer</i> Description: Developed flight dynamics software for the International Space Station.	1998 - 1999
Applied Research Laboratories , Austin, Texas Department of Defense <i>Undergraduate Researcher</i> Description: Work on analysis of GPS data for ballistic missile testing.	1997 - 1998
Fusion Research Center , Austin, Texas University of Texas at Austin <i>Undergraduate Researcher</i> Description: Work on experimental design for Tokamaks.	1996 - 1997

AWARDS AND
RECOGNITION

- 2014-present: Member, IEEE Technical Committee on Systems with Uncertainty.
- 2013-present: Member, IEEE Technical Committee on Power Generation Control.
- 2011: NSF CAREER recipient.
- 2006: INRIA (French) Postdoctoral Fellow.
- 2001: Boeing Graduate Fellow.
- 1999: Graduated Cum Laude in both Physics and Aerospace Engineering (203 credit hours), The University of Texas at Austin.

GRADUATE
STUDENTS
ADVISED

Gregory Miller , MS student	2009 - 2010
Farui Peng , MS student	2009 - 2010
Chaitanya Murti , MS student (defended at IIT)	2010-2012
Aditya Gahlawat , PhD student (Chateaubriand Fellow, defended at IIT)	Graduated Fall, 2016
Reza Kamyar , PhD student (defended at ASU)	Graduated Spring, 2016
Evgeney Meyer , PhD candidate (Passed qualifying exam at ASU in 2015)	2013 - 2015
Hesameddin Mohamaddi , PhD student	2015 - 2017
Mohammadreza Ebrahimi , PhD student	2017-2018
Rushabh Talati , MS thesis student (defended Spring, 2018)	2017-2018
Brendon Colbert , PhD student (Dean's and NSF GRFP Fellow)	2016 - present
Morgan Jones , PhD student	2016-present
Sachin Shivakumar , PhD student	2017 - present
Olga Skowronek , PhD student (Dean's Fellow)	2018 - present
Amritam Das , PhD student (at Eindhoven U. w. advisor Seip Weiland)	2018 - present
Shuangshuang Wu , PhD student (at Yanshan U. w. Changchun Hua)	2018 - present

STUDENT THESES
SUPERVISED

- [1] **Rushabh Talati, M. Sc.** *Implementation and Comparison of H_∞ Observers for Time Delay Systems*. Defended at ASU in April, 2018.
- [2] **Reza Kamyar, Ph. D.** *Parallel Optimization of Polynomials for Large-Scale Problems in Stability and Control*. Defended at ASU in January, 2016.
- [3] **Aditya Gahlawat, Ph. D.** *Analysis and Control of Parabolic Partial Differential Equations*

with Application to Tokamaks using Sum-of-Squares Polynomials. Defended at IIT in October, 2015.

[4] **Evgeny Meyer, M. Sc.** *A Convex Approach for Stability Analysis of Partial Differential Equations.* Defended at ASU in June, 2016.

[5] **Chaitanya Murti, M. Sc.** *Analysis of Zeno Stability in Hybrid Systems Using Sum-of-Squares Programming.* Defended at IIT in December, 2012.

STUDENT THESES
AS COMMITTEE
MEMBER

1. **Shiba Biswal , Ph. D.** August. 2019
2. **Karthik Elamvazhuthi , Ph. D.** June. 2019
3. **Penhong Guo, Ph. D.** Nov. 2018
4. **Csar Martin Moreno, Ph. D.** Sept. 2016
5. **Gustavo Seixas, M. Sc.** Nov. 2016
6. **Karthik Elamvazhuthi , M. Sc.** Nov. 2014
7. **Sunil A. Deshpande, Ph. D.** April 2014

BARRETT HONORS
THESES SUPERVISED

1. **Sarah Smallwood** *An Assessment of the Performance of Machine Learning Techniques When Applied to Trajectory Optimization* Defended April 20, 2018.

FURI PROJECTS
SUPERVISED

1. **Ryan Davis** *F/A-18 Nonlinear Dynamic System Control* Presented November 17, 2017.

HONORS
CONTRACTS
SUPERVISED

1. **James Torla** AEE 462, Spring 2019.
2. **Ryley Miller** AEE 462, Spring 2019.
3. **Andrew Hodges** MAE 318, Fall 2018.
4. **Michael Joseph Roden** MAE 318, Fall 2018.
5. **Alexander Watson** AEE 462, Spring 2018.
6. **Maclain Bonfield** AEE 462, Spring 2018.
7. **Alexander Watson** AEE 462, Spring 2018.
8. **Michael Padilla** AEE 462, Spring 2017.
9. **Grant Doering** AEE 462, Spring 2017.
10. **Anthony Herrera** AEE 462, Spring 2017.
11. **Eden Shuster** MAE 318, Fall 2015.
12. **Jonathon Langerman** MAE 318, Fall 2015.

UNDERGRADUATE
ORGANIZATIONS
ADVISED

1. **Students for the Exploration and Development of Space (SEDS) - Rocketry Division (82 Students)** *Principal Supervisor* 2016-present

Summary: I have 17 journal papers published or accepted and 2 journal papers under review. 8 of these have graduate students as first author (Student authors are shown in **bold**). 13 of these are in Automatica or IEEE TAC - the top two journals in control. I have 6 book chapters, two of which has a graduate student author as first author. I have 68 conference papers published or accepted and 0 under review. 48 of these are in the CDC or ACC proceedings. CDC and ACC are the top two conferences in control and CDC and ACC proceedings are listed by Google metrics as the number 5 and 6 top publications in control overall based on h5-index (including journal publications). Of the conference publications, 32 have a graduate student as first author. The total is 85 published (or to appear) and 2 under review. All papers and many conference presentations can be downloaded from <http://control.asu.edu>

- [1] **B. Colbert** and M. Peet *A Convex Parametrization of a New Class of Universal Kernel Functions for use in Kernel Learning*. Journal of Machine Learning Research. Submitted.
- [2] M. Peet *A New Mathematical Framework for Representation and Analysis of Coupled PDEs*. IEEE Transactions on Automatic Control. Submitted.
- [3] **M. Jones** and M. Peet *Extensions of the Dynamic Programming Framework: Battery Scheduling, Demand Charges, and Renewable Integration*. IEEE Transactions on Automatic Control. To Appear. Full Paper.
- [4] M. Peet *A Convex Solution of the H_∞ -Optimal Controller Synthesis Problem for Multi-Delay Systems*. IEEE Transactions on Automatic Control. Provisionally Accepted.
- [5] M. Peet *SOS Methods for Multi-Delay Systems: A Dual Form of Lyapunov-Krasovskii Functional*. IEEE Transactions on Automatic Control. May, 2019. Full Paper.
- [6] **C. Murti** and M. Peet *Using SOS for Analysis of Zeno Stability in Hybrid systems with Non-linearity and Uncertainty*. Submitted to SIAM Journal on Control and Optimization.
- [7] **A. Gahlawat** and M. Peet *A Convex Sum-of-Squares Approach to Analysis, State Feedback and Output Feedback Control of Parabolic PDEs*. IEEE Transactions on Automatic Control. Vol. 62, No. 4, April, 2017. Full Paper.
- [8] **R. Kamyar** and M. Peet *Optimal Thermostat Programming for Time-of-Use and Demand Charges with Thermal Energy Storage and Optimal Pricing for Regulated Utilities*. IEEE Transactions on Power Systems. Vol. 32, No. 4, July, 2017. Full Paper.
- [9] **R. Kamyar** and M. Peet *Polynomial Optimization with Applications to Stability Analysis and Control - Alternatives to Sum-of-Squares*. Discrete and Continuous Dynamical Systems - Series B. Special Issue on "Computational Methods for Lyapunov Functions". **Survey Paper**. Vol. 20, No. 8, pp. 2383-2417, 2015.
- [10] **R. Kamyar**, M. Peet and Y. Peet *Solving Large-Scale Robust Control Problems by Exploiting the Parallel Structure of Poly's Theorem*. IEEE Transactions on Automatic Control. Vol. 58, No. 8, Aug., 2013. Full Paper.
- [11] 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.
- [12] 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.
- [13] **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.
- [14] 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.

[15] 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.

[16] 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. Full Paper.

[17] 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.

[18] 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.

[19] 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

[20] **S. Shivakumar** and **E. Skowronek** and R. Kang and M. Peet. *Implementation of Decentralized Observers and Controllers in a Hydrostatic Soft Robot Testbed*. Invited Submission for chapter in “Bioinspired Sensing, Actuation, and Control in Underwater Soft Robotic Systems”, Springer.

[21] **G. Miao** and M. Peet and K. Gu. *Inversion of Separable Kernel Operator and Its Application in Control Synthesis*. Invited Submission for chapter in “Delays and Interconnections: Methodology, Algorithms and Applications”, Springer. March, 2019.

[22] 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”, vol. 1 of Advances in Delays and Dynamics. Springer, 2013.

[23] **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.

[24] 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.

[25] 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.

CONFERENCE TUTORIALS

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

Presenting author indicated by *.

[26] **A. Das*** and **S. Shivakumar** and S. Weiland and M. Peet *Using SDP to Parameterize Universal Kernel Functions* Proceedings of the 58th IEEE Conference on Decision and Control. Nice, Fr. December 11-13, 2019. To appear.

- [27] **B. Colbert*** and M. Peet *Using SDP to Parameterize Universal Kernel Functions* Proceedings of the 58th IEEE Conference on Decision and Control. Nice, Fr. December 11-13, 2019. To appear.
- [28] **M. Jones*** and M. Peet *Relaxing The Hamilton Jacobi Bellman Equation To Construct Inner And Outer Bounds On Reachable Sets* Proceedings of the 58th IEEE Conference on Decision and Control. Nice, Fr. December 11-13, 2019. To appear.
- [29] **S. Wu** and C.-C. Hua and M. Peet* *Estimator-Based Output-Feedback Stabilization of Linear Multi-Delay Systems using SOS* Proceedings of the 58th IEEE Conference on Decision and Control. Nice, Fr. December 11-13, 2019. To appear.
- [30] **S. Shivakumar*** and **A. Das** and S. Weiland and M. Peet *A Generalized LMI Formulation for Input-Output Analysis of Linear Systems of ODEs Coupled with PDEs* Proceedings of the 58th IEEE Conference on Decision and Control. Nice, Fr. December 11-13, 2019. To appear.
- [31] **M. Jones*** and M. Peet *Using SOS and Sublevel Set Volume Minimization for Estimation of Forward Reachable Sets* Proceedings of the 11th IFAC Symposium on Nonlinear Control Systems. Vienna, Austria. Sept 4-6, 2019. To appear.
- [32] M. Peet* and **A. Das** and **S. Shivakumar** and S. Weiland *Discussion Paper: A New Mathematical Framework for Representation and Analysis of Coupled PDEs* Proceedings of the 2019 American Control Conference. Philadelphia, PA. July 10-12, 2019.
- [33] M. Peet* *H_∞ -Optimal Control of Systems with Multiple State Delays: Part 1* Proceedings of the 2019 American Control Conference. Philadelphia, PA. July 10-12, 2019.
- [34] M. Peet and K. Gu* *H_∞ -Optimal Estimation of Systems with Multiple State Delays: Part 2* Proceedings of the 2019 American Control Conference. Philadelphia, PA. July 10-12, 2019.
- [35] **B. Colbert*** and L. Crespo and M. Peet *A Sum of Squares Optimization Approach to Uncertainty Quantification* Proceedings of the 2019 American Control Conference. Philadelphia, PA. July 10-12, 2019.
- [36] **S. Shivakumar*** and M. Peet *Computing Input-Output Properties of Coupled PDE systems* Proceedings of the 2019 American Control Conference. Philadelphia, PA. July 10-12, 2019.
- [37] **M. Jones*** and M. Peet *Sublevel Set Volume Minimization for Outer Set Approximations of Attractors* Proceedings of the 2019 American Control Conference. Philadelphia, PA. July 10-12, 2019.
- [38] M. Peet* *A New State-Space Representation for Coupled PDEs and Scalable Lyapunov Stability Analysis in the SOS Framework* Proceedings of the 57th IEEE Conference on Decision and Control. Miami, FL. December 17-19, 2018.
- [39] **B. Colbert*** and M. Peet *Estimating the Region of Attraction using Stable Trajectory Measurements* Proceedings of the 57th IEEE Conference on Decision and Control. Miami, FL. December 17-19, 2018.
- [40] **A. Doroudchi*** and **S. Shivakumar*** and S. Berman and M. Peet *Decentralized Control of Distributed Actuation in a Segmented Soft Robot Arm* Proceedings of the 57th IEEE Conference on Decision and Control. Miami, FL. December 17-19, 2018.
- [41] M. Peet* and K. Gu *A Dynamic Programming Approach to Evaluating Multivariate Gaussian Probabilities* Proceedings of the 23rd International Symposium on Mathematical Theory of Networks and Systems. Hong Kong. July 16-20, 2018.
- [42] **M. Jones*** and M. Peet *Synthesis of Full-State Observers for Time-delay Systems using SOS* Proceedings of the 23rd International Symposium on Mathematical Theory of Networks and Systems.

Hong Kong. July 16-20, 2018.

- [43] **B. Colbert*** and **H. Mohammadi** and M. Peet *Combining SOS with Branch and Bound to Solve Global Polynomial Optimization Problems* Proceedings of the 2018 American Control Conference. Milwaukee, WI. June 27-19, 2018.
- [44] M. Peet* *A Convex Reformulation of the Controller Synthesis Problem for Infinite-Dimensional Systems using Linear Operator Inequalities (LOIs) with Application to MIMO Multi-Delay Systems* Proceedings of the 2018 American Control Conference. Milwaukee, WI. June 27-19, 2018. Invited Session.
- [45] **M. Jones*** and M. Peet *Solving Dynamic Programming with Supremum Terms in the Objective and Application to Optimal Battery Scheduling for Electricity Consumers Subject to Demand Charges* Proceedings of the 56th IEEE Conference on Decision and Control. Melbourne, Australia. December 12-15, 2017.
- [46] **M. Jones*** and **H. Mohammadi** and M. Peet *Estimating the Region of Attraction Using Polynomial Optimization: a Converse Lyapunov Result* Proceedings of the 56th IEEE Conference on Decision and Control. Melbourne, Australia. December 12-15, 2017.
- [47] **H. Mohammadi*** and M. Peet *Combining SOS and Moment Relaxations with Branch and Bound to Extract Solutions to Global Polynomial Optimization Problems* SIAM Conference on Optimization. July, 2017.
- [48] **G. Miao**, M. Peet* and K. Gu *Inversion of Separable Kernel Operators in Coupled Differential-Functional Equations and Application to Controller Synthesis* IFAC World Congress. Toulouse, France. July 9-14, 2017.
- [49] **R. Kamyar*** and M. Peet *A Multi-objective Approach to Optimal Energy Storage for Residential Customers in The Presence of Demand Charges* Proceedings of the 55th IEEE Conference on Decision and Control. Las Vegas, NV. December 12-14, 2016.
- [50] **A. Gahlawat*** and M. Peet *Optimal State-Feedback Boundary Control of Parabolic PDEs Using SOS Polynomials* Proceedings of the American Control Conference. Boston, MA. June, 2016.
- [51] **A. Gahlawat*** and M. Peet *Stability analysis of parabolic linear PDEs with two spatial dimensions using Lyapunov method and SOS* Proceedings of the 54th IEEE Conference on Decision and Control. **Invited Session**. Osaka, Japan. December 15-17, 2015.
- [52] **E. Meyer*** and M. Peet *Output Feedback Control of Inhomogeneous Parabolic PDEs with Point Actuation and Point Measurement using SOS and Semi-Separable Kernels* Proceedings of the 54th IEEE Conference on Decision and Control. **Invited Session**. Osaka, Japan. December 15-17, 2015.
- [53] **R. Kamyar*** and M. Peet *The effect of distributed thermal storage on optimal pricing and optimal thermostat programming in a regulated smart grid* Proceedings of the American Control Conference. Chicago, IL. July 1-3, 2015.
- [54] **R. Kamyar*** and M. Peet *Constructing Piecewise Polynomial Lyapunov Functions Over Arbitrary Convex Polytopes Using Handelman's Basis* Proceedings of the 53rd IEEE Conference on Decision and Control. Los Angeles, CA. December 15-17, 2014.
- [55] M. Peet* *LMI Parameterization of Lyapunov Functions for Infinite-Dimensional Systems: A Toolbox*. Proceedings of the the American Control Conference. **Invited Session**. Portland, OR. June, 2014.
- [56] **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.

- [57] **B. Li** and M. M. Peet*. *Stability Analysis of State-Dependent Delay Systems using Sum-of-Squares*. AIAA Conference on Guidance, Navigation and Control. **Invited Session**. Boston, MA. Aug. 19-22, 2013.
- [58] **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.
- [59] 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.
- [60] **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.
- [61] **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.
- [62] **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, 2012.
- [63] **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.
- [64] 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.
- [65] A. Seuret* and M. Peet. *SOS for Sampled-Data Systems*. Proceedings of the IFAC World Congress. **Invited Session**. Milan, Italy. Aug. 28-Sept. 2, 2011.
- [66] **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. **Invited Session**. Milan, Italy. Aug. 28-Sept. 2, 2011.
- [67] 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.
- [68] **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.
- [69] 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.
- [70] 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.
- [71] M. M. Peet* and A. Papachristodoulou *Using Polynomial Semi-Separable Kernels to Construct Infinite-Dimensional Lyapunov Functions*. Proceedings of the IEEE Conference on Decision and Control. **Invited Session**. Cancun, Mexico. December 9-11, 2008.
- [72] 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.

[73] 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.

[74] 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

[75] 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

[76] 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)**

[77] 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.

[78] 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.

[79] 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

Presenting author indicated by *.

[80] **R. Kamyar*** and M. M. Peet. *A Multi-objective Approach to Optimal Battery Storage in The Presence of Demand Charges.* 4th International High Performance Buildings Conference. West Lafayette, IN. July 11-14, 2016. **Invited Session.**

[81] **A. Gahlawat** and M. M. Peet*. *Optimal Boundary Control and Estimation of Parabolic PDEs Using Sum-of-Squares (SOS) Polynomials.* SIAM Conference on Control Theory and Applications. Paris, France. July 8-10, 2015. **Invited Session.**

[82] **E. Meyer*** and M. M. Peet. *Stability Analysis of PDEs with Two Spatial Dimensions Using Lyapunov Methods and SOS.* SIAM Conference on Dynamical Systems. Snowbird, Utah. May 17-21, 2015. **Invited Session.**

[83] M. M. Peet*. *A Control Framework for Immunology: Change Detection using Differential Control.* SIAM Conference on Dynamical Systems. Snowbird, Utah. May 26, 2011. **Invited Session.**

[84] **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. **Invited Session.** Prague, Czech Republic. June 7 - 9, 2010.

[85] M. M. Peet* and A. Papachristodoulou. *Inverses of Positive Linear Operators and State Feedback Design for Time-Delay Systems.* 8th IFAC Workshop on Time-Delay Systems. Sinaia, Romania. **Invited Session.** Sept. 1-3, 2009.

[86] 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.

[87] M. M. Peet* and P.-A. Bliman. *The Weierstrass Approximation Theorem on Linear Vari-*

eties: Polynomial Lyapunov Functionals for Delayed Systems. Mathematical Theory of Networks and Systems, Blacksburg, VA. July 28 - Aug. 1, 2008.

[88] M. M. Peet*, P. S. Kim, S.-I. Niculescu, D. Levy, and A. Papachristodoulou. *Model Analysis of Chronic Myelogenous Leukemia with Treatment Options using Structure and Computation: Sensitivity to Nonlinearity and Delay.* European Conference on Mathematical and Theoretical Biology, Edinburgh, Scotland. June 29 - July 4, 2008.

[89] 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.

[90] 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.

[91] 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.

[92] 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.

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

[94] 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 **Summary:** I have given 48 invited seminars. Of these 21 seminars are since joining ASU. For those seminars for which I retain records, I have indicated the supporting/sponsoring seminar venue or series.

1. The Technical University of Eindhoven, Eindhoven, Netherlands, September 2019.
2. The University of Campinas, Campinas, Brasil, June 2019.
3. The University of Texas at Austin (Institute for Computational Engineering & Sciences), Austin, Texas, March 2018.
4. Center for Advanced Studies (CINVESTAV) (Department of Automatic Control, Department Seminar), Mexico City, Mexico. October, 2017;
5. The University of Porto (Faculdade de Engenharia Dept. Seminar), Porto, Portugal. July, 2017;
6. The University of New Mexico (Mech. Eng. Dept. Seminar), Albuquerque, NM. December, 2016;
7. The University of Arizona (Aerospace and Mech. Eng. Dept. Seminar), Tuscon, AZ. September, 2014;
8. ARPA-E workshop on "The Grid of The Future: From Vertical to Flat." Washington, D.C. July 31, 2014.
9. LAAS, Toulouse, France. July, 2014;
10. The University of Nantes, Nantes, France. July, 2014;
11. Katholieke Universiteit Leuven (NATW Seminar Series), Leuven, Belgium. July, 2014;
12. The University of Campinas (Electrical Eng. Dep. Seminar), Campinas, Brasil. March, 2014;
13. The University of California at Los Angeles (Control Seminar Series), Los Angeles, CA. January, 2014;
14. Los Alamos National Laboratory (Systems Biology Group), Los Alamos, NM. August, 2013;

15. Los Alamos National Laboratory (Power Systems Group), Los Alamos, NM. August, 2013;
16. Workshop on “Lyapunov Functions and Computational Methods” Reykjavik University, Reykjavik, Iceland. July, 2013;
17. The University of Michigan (Aerospace Engineering Dept. Seminar), Ann Arbor, MI. February, 2013;
18. New York University (Polytechnic Engineering Dept. Seminar), New York, NY. December, 2012;
19. Otto-von-Guericke University Magdeburg (Systems and Controls Seminar Series), Magdeburg, Germany. November, 2012;
20. Institute Joseph Fourier, Grenoble, France. November, 2012;
21. The University of Oxford, Oxford, UK. November, 2012;
22. The University of Texas at El Paso. El Paso, TX. March, 2012.
23. Arizona State University. Tempe, AZ. February, 2012.
24. City of Hope Medical Center. Beckman Research Institute. Duarte, CA. February, 2012.
25. Georgia Institute of Technology. Atlanta, GA. February, 2012.
26. Illinois Institute of Technology (MMAE Dept. Seminar) . Chicago, IL. January, 2012.
27. Argonne National Laboratory (LANS Seminar Series). Lemont, IL. January, 2012.
28. Texas A&M University (Symposium on Dynamical Systems with Time-Variability, Delay, or Discontinuities). College Station, TX. March, 2011.
29. Lehigh University (Mechanical Engineering Dept. Seminar Series). Bethlehem, PA. February, 2011.
30. The University of California. Berkeley, CA. February, 2011.
31. Stanford University. Stanford, CA. January, 2011.
32. University of Notre Dame. South Bend, IN. Oct. 14, 2010.
33. University of Oxford. Oxford, UK. June 16, 2010.
34. University of Grenoble. Grenoble, France. June 11, 2010.
35. University of Minnesota. Minneapolis-St. Paul, MN. April 19, 2010.
36. University of Utah. Salt Lake City, UT. March 31, 2010.
37. Stanford University. Stanford, CA. May, 2009.
38. The University of Southern Illinois. Edwardsville, IL. February, 2009.
39. University of Illinois at Urbana-Champaign. Champaign, IL. October, 2008.
40. LAAS, Groupe de Travail EDP - GDR MACS. Toulouse, France. June, 2008.
41. State University of Campinas. Campinas, Brasil. June, 2008.
42. Katholieke Universiteit Leuven. Leuven, Belgium. May, 2008.
43. Illinois Institute of Technology. Chicago, IL. March, 2008.
44. ARC ModLMC. Workshop “Haematopoiesis and its Disorders. Modeling, Experimental and Clinical Approaches.” Paris, France, March 21, 2008.
45. State University of Campinas, Brasil. March, 2007.
46. Réunion EDP-MOSAR Paris. March, 2007.
47. INRIA - Rocquencourt. Rocquencourt, France. November 2006.
48. Seagull Technology. May, 2005.

CONFERENCE
PRESENTATIONS

Summary: I have personally given 54 conference/workshop presentations. Of these, 21 conference/workshop talks are since joining ASU. The rest of the conference presentations were given by students.

1. American Control Conference. Philadelphia, PA. Present Paper ThC17.4. July 11, 2019.
2. SIAM Conference on Control and its Applications (CT19). Chengdu, China. July 21, 2019.
3. Conference on Distributed-Parameter Systems. Oaxaca, Mexico. May 22, 2019.
4. ONR Bio-Inspired Autonomous Systems Program Review. Arlington, VA. May 16, 2019.
5. ONR BRC Annual Meeting. Present Project. UCLA, CA. April 3, 2019.
6. IEEE Conference on Decision and Control. Present Paper: MoA15.6, December 2018.
7. Conference on Mathematical Theory of Networks and Systems. Paper Presentation: TuD7.1. Hong Kong. July, 2018.
8. IFAC World Congress. Present Paper TuP15.5. Toulouse, France. July 11, 2017.
9. IFAC Conference on Time-Delay Systems. Present Abstract RS16.1. Budapest, Hungary. June 30, 2018.
10. American Control Conference. Milwaukee, WI. Present Paper ThB04.4. June 28, 2018.
11. ONR Bio-Inspired Autonomous Systems Program Review. Arlington, VA. June, 2017.
12. ONR BRC Annual Meeting. Present Project. USC, Los Angeles, CA. March, 2018.
13. American Control Conference. Seattle, WA. Present Paper FrB14.1. May 26, 2017.
14. SIAM Conference on Optimization. Vancouver, CA. Present Paper CP21. May 24, 2017.
15. ONR Soft Robotics Kickoff Meeting. Present Project. College Park, MD. March, 2017.
16. SIAM Conference on Control and its Applications (CT15). Paris, France. July 9, 2015.
17. American Control Conference. Portland, OR. Present Paper WeA11.2. June 4, 2014.;
18. IEEE Conference on Decision and Control. Present Paper: ThC18.1, December 2013.
19. AIAA Conference on Guidance, Navigation and Control. Boston, MA. August, 2013;
20. IFAC Workshop on Time-Delay Systems. Present Paper. Grenoble, France. February, 2013.
21. American Control Conference. Montreal, Canada. Present Paper FrB20.4. June 29, 2012.;
22. IEEE Conference on Decision and Control. Present Paper: TuB02.3, December 2011.
23. IEEE Conference on Decision and Control. Present Paper: ThA17.3, December 2011.
24. IFAC World Congress. Present Paper. Milan, Italy. September, 2011.
25. IEEE Conference on Decision and Control. Present Paper: FrA20.5, December 2010.
26. American Control Conference. Baltimore, MD. Present Paper FrA05.2. July 2, 2010.
27. American Control Conference. Baltimore, MD. Present Paper FrA09.6. July 2, 2010.
28. IFAC Workshop on Time-Delay Systems. Present Paper. June 8, 2010.
29. IEEE Conference on Decision and Control. Present Paper: ThA01.4, December 2009.
30. 8th IFAC Workshop on Time-Delay Systems. Present Paper. Sinaia, Romania. Sept., 2009.
31. IEEE Conference on Decision and Control. Present Paper: TuB07.3, December 2008.
32. Conference on Mathematical Theory of Networks and Systems. Paper Presentation: RSA1gGeo.2. Blacksburg, Virginia. July, 2008.
33. Conference on Mathematical Theory of Networks and Systems. Paper Presentation: RSDelay2.1. Blacksburg, Virginia. July, 2008.
34. IFAC World Congress. Pre-conference Workshop: WS7, Seoul, South Korea. July, 2008.
35. IFAC World Congress. Present Paper: MoB02.2, Seoul, South Korea. July, 2008.
36. IFAC World Congress. Present Paper: MoC14.5, Seoul, South Korea. July, 2008.
37. European Conference on Mathematical and Theoretical Biology. Edinburgh, U.K., June 29th - July 4th, 2008.
38. ICNPAA 2008: Mathematical Problems in Engineering, Aerospace and Science. Genoa, Italy. June, 2008.
39. IEEE Conference on Decision and Control. Present Paper: WePI27.12, December 2007.
40. IEEE Conference on Decision and Control. Present Paper: ThPI23.18, December 2007.

41. 45th Annual Allerton Conference on Communication, Control and Computing. Monticello, IL. Sept. 26-28, 2007.
42. 7th IFAC Workshop on Time-Delay Systems. Present Paper 55. Nantes, France. Sept. 17-19, 2007.
43. 7th IFAC Workshop on Time-Delay Systems. Present Paper 67. Nantes, France. Sept. 17-19, 2007.
44. IFAC Workshop on Control of Distributed Parameter Systems. Namur, Belgium. June 22-27, 2007.
45. Conférence de la SMAI sur l'optimisation et la décision. April, 2007.
46. Réunion EDP-MOSAR Paris. March, 2007.
47. IEEE Conference on Decision and Control. Present Paper: WeA06.1, December 2006.
48. IEEE Conference on Decision and Control. Present Paper: WeA06.4, December 2006.
49. American Control Conference. Present Paper: ThB18.6, June 2005.
50. Stanford Aerospace Affiliates. April, 2005.
51. IEEE Conference on Decision and Control. Present Paper: TuC03.6, December 2004.
52. IFAC Symposium on Nonlinear Control Systems(NOLCOS). August 2004.
53. Stanford Aerospace Affiliates. April, 2004.
54. GPS III Conference. June, 2001.

FUNDED RESEARCH PROJECTS

Summary: I am PI on 11 funded external sponsored projects (10 as sole PI) and co-PI on one project. The funding for my lab from these projects is \$2,336,015. I am PI on 6 funded NSF proposals, one of which is a CAREER award. The NSF projects total \$1,749,913. The other projects are worth \$586,102.

- **Sponsor: NSF CPS CPS: Medium: A Decentralized Estimation and Control Framework for Networks of Flexible Sensors and Actuators in Soft Robots** ; Role: PI; Amount: \$1,200,000; Status: Invited for Resubmission as Medium Proposal;
- **Sponsor: NSF EPCN Optimizing Risk in a Gauss-Markov Process - Energy Storage Strategies for Renewable Integration** ; Role: PI; Amount: \$304,590; Status: Pending;
- **Sponsor: NSF CMMI-1935453 Declaring War on Boundary Condition: A Control-Oriented Framework for PDEs** ; Role: PI; Amount: \$259,981; Status: **FUNDED**; Dates: 9/1/2019-8/31/2022.
- **Sponsor: NSF CMMI-1931270 A Convex Computational Framework for Understanding and Controlling Nonlinear Systems** ; Role: PI; Amount: \$267,752; Status: **FUNDED**; Dates: 9/1/2019-8/31/2022.
- **Sponsor: NSF CNS-1739990 CPS: Small: A Convex Framework for Control of Interconnected Systems over Delayed Networks**; Role: PI; Amount: \$304,707; Dates: 9/1/17 08/31/20; Status: **FUNDED**;
- **Sponsor: ONR Octopus-Inspired Autonomous Arms for Soft Robotics with Adaptive Motions**; Role: Co-PI; Amount: \$2,000,000.00; My Share: \$344,523; Dates: 1/1/17 12/31/20; Status: **FUNDED**;
- **Sponsor: SRP (Arizona Power Company) The Effect of Dynamic Variability in Renewable Generation on Resource Planning and Reserve Activation**; Role: Sole PI; Amount: \$62,891; Dates: 9/1/15 8/31/16; Status: **FUNDED**;
- **NSF CMMI-1538374 Stability Analysis of Large-Scale Nonlinear Systems using Parallel Computation** Program: Control Systems; Role: Sole PI; Amount: \$280,000; Dates: 09/1/2015 - 08/31/2018; Status: **FUNDED**.
- **Sponsor: SRP (Arizona Power Company) Quantifying the Benefits and Optimal Use of Battery Storage for SRP and Solar Customers with Demand Charges**; Role: Sole PI; Amount: \$88,388; Dates: 9/1/15 8/31/16; 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 CMMI-1100376 Solving Large Sum-of-Squares Optimization Problems in Control by Exploiting the Parallel Structure of Polyá's Algorithm** Role: Sole PI; Amount: \$237,473; Dates: 9/1/2011-8/31/2015; 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**.
- **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**.
- **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**

SOFTWARE
CREATED

Note: All software is available for download here.

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 quasipolynomial transfer functions for both delay-independent and delay-dependant H_∞ stability 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>

COURSES TAUGHT

I have taught 7 distinct classes, including the ASU classes MAE 318 (lower division), AAE 462, MAE 507, MAE 598 and AAE 101 and the IIT classes MMAE 441, MMAE 443, and MMAE 543. MMAE 443 is similar in substance to MAE 318, and I have taught these two a combined 9 times. MMAE 519/543 is similar in substance to MAE 507, and I have taught these two a combined 5 times. **My undergraduate teaching evaluation score averages 4.2.** If embedded links do not work, all Lecture Notes are available at http://control.asu.edu/class_frame.htm.

MAE 462: Space Vehicle Dynamics and Control 3 credit hours. Undergraduate, Upper-Division. Average class size: 70. 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 Torque-free motion. Click Here for Online Lecture Notes Original slides with illustrations, movies, and embedded multimedia. Texts: Prussing/Conway. **NOTE:** This web site is in the top 3 google search results for several orbits-related keywords e.g. [Lamberts problem](#), [bi-elliptic](#), [hyperbolic orbit](#), [orbit perturbation](#), [interplanetary mission planning](#).

MAE 318: Systems Analysis and Control (w/ Lab) 5 credit hours. Undergraduate, Lower-Division. Average class size: 90. A lower-division course 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. There is a 1 credit lab component. Click Here for Online Lecture Notes. Text: Franklin, Powell and Emami;

MAE 598: LMI Methods in Robust and Optimal Control 3 credit hours. Graduate. Average class size: 15. An advanced graduate course which surveys the use of optimization in variety of sub-fields of control. The selection of sub-fields is based on student preference as measured via anonymous survey. In Fall, 2016 we covered: Controllability and Observability; LQR; LQG; Kalman

Filtering; Optimal H_∞ Output-Feedback Controller Synthesis; Optimal H_2 Output-Feedback Controller Synthesis; Robust Control; μ -analysis; D-K iteration; Nonlinear Stability; Sum-of-Squares; Nonlinear Controller Synthesis; and Hybrid Systems. Click Here for Online Lecture Notes Texts: LMIs in Control Systems: Analysis, Design and Applications by Duan and Yu.

PAUT54A1: MiniCourse on LMI and SOS Methods in Control A 16.5 hour advanced 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. Click Here for Online Lecture Notes Taught: Spring, 2013 at the University of Grenoble; Spring, 2014 at the University of Campinas;

MiniCourse on LMI, SOS and PDEs A 16.5 hour advanced 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. Click Here for Online Lecture Notes Taught: Winter, 2019 at the University of Campinas; Fall, 2019 at the Technical University of Eindhoven.

MAE 507: Fundamentals of Control and Optimization (Control Systems II) 3 credit hours. Graduate. Average class size: 15. 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. Click Here for Online Lecture Notes Texts: A Course in Robust Control Theory: A Convex Approach by Dullerud and Paganini.

AAE 101: Introduction to ASU 1 credit hour. Undergraduate, Freshman. Average class size: 22. An introductory course for Freshman on Ethics; Career preparation and Jobs in Aerospace Engineering; Test-Taking and Study Strategies; Professional Standards and Practices. Taught Fall, 2014; Fall, 2015.

MMAE 441: Spacecraft and Aircraft Dynamics (IIT) 3 credit hours. Undergraduate, Upper-Division. Average class size: 40. 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. Taught in Fall, 2008 and Fall, 2010. Click Here for Online Lecture Notes (Aircraft Dynamics Only). Texts: Etkin/Reid, Vallado.

MMAE 519/543: Modern Control Systems (IIT) 3 credit hours. Graduate Level. Average class size: 13. Similar in content to MAE 507, but without Robust Control and less material on optimization.

MMAE 443: Systems Analysis and Control (IIT) 3 credit hours. Undergraduate, Upper-Division. Average class size: 60. Similar in Content to MAE 318, but without lab component.

SERVICE

- Funding Evaluation Panels: United States National Science Foundation; Czech Science Foundation; Icelandic Research Fund; Romanian Joint Applied Research Projects - PCCA (2012, 2013, 2016, 2017); South African National Research Foundation.
- European PhD Award on Control - Best Thesis award committee;
- IEEE CDC Best Student Paper Award Committee
- IEEE Technical Committee on Power Generation Control
- IEEE Technical Committee on Systems with Uncertainty
- International Program Committee: American Control Conference. Denver, CO. 2020;
- International Program Committee: IFAC Workshop on Time-Delay Systems. Sinaia, Romania, 2019;
- International Program Committee: IEEE Multi-Conference on Systems and Control. Hyderabad,

- India, 2012; IEEE Multi-Conference on Systems and Control. Denver, CO, 2011;
- International Program 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: “Machine Learning II” at the 2019 Conference on Decision and Control. Chair: “Distributed Parameter Systems I” at the 2019 American Control Conference. Chair: “Modeling II” at the 2019 American Control Conference. Chair: “Optimization IV” at the 2019 American Control Conference. Chair: “Lyapunov Methods III” at the 2018 Conference on Decision and Control. Chair: “Decentralized Control” at the 2018 Conference on Decision and Control. Chair: “Delay and Event Systems” at the 2018 Symposium on Mathematical Theory of Networks and Systems. Chair: “Optimization II” at the 2018 Symposium on Mathematical Theory of Networks and Systems. Chair: “ H_∞ Control and Fractional Order Systems” at the 2018 IFAC Workshop on Time-Delay Systems Chair: “Optimization Algorithms III” at the 2018 American Control Conference. Chair: “Delay Systems I” at the 2018 American Control Conference. Chair: “Optimal Control III” at the 2017 Conference on Decision and Control. Co-Chair: “Time-Delay Systems” at the 2017 IFAC World Congress. Chair: “Delay Systems I” at the 2017 American Control Conference. Chair: “Polynomial Optimization” at the 2017 SIAM Conference on Optimization. Chair: “Distributed Parameter Systems I” at the 2016 American Control Conference. Co-Chair: “Distributed Parameter Systems II” at 54th IEEE Conference on Decision and Control, 2015. 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. Chair, “Constructing Lyapunov Functions”, at the 53rd IEEE Conference on Decision and Control, 2014.
 - Reviewer for 49 journals with 300+ reviews (Journal and # of reviews): ACM SIGCOMM Computer Communication Review (3); AIAA Journal on Guidance, Control and Dynamics (2); American Control Conference 2010, 2011, 2012, 2014, 2016, 2017, 2018 2019 (17); AMS Math Reviews (3); Applied Physical Modeling (3) ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (1); ASME Journal of Dynamic Systems, Measurements and Control (3); Asian Journal of Control (1); Automatica (72); Celestial Mechanics and Dynamical Astronomy (2); Control Engineering Practice (1); Conference on Control and Optimization with Industrial Applications(1); CSS Letters (L-CSS) (1); Discrete and Continuous Dynamical Systems - Series B (2);European Control Conference 2013 (1); European Journal of Control (1); Frontiers of Information Technology & Electronic Engineering (1); IEEE/CSS Conference on Decision and Control 2006, 2008, 2009, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018 (36); IEEE Multi-Conference on Systems and Control (2); IEEE Transactions on Automatic Control (76); IEEE Transactions on Automation Science and Engineering (1); IEEE Transactions on Circuits and Systems - I (7); IEEE Transactions on Control of Network Systems (2); IEEE Transactions on Control Systems Technology (5); IET Control Theory and Applications (2); IFAC Workshop on Time-Delay Systems 2006, 2010, 2012, 2018 (10); IMA Journal on Mathematics Control Information (7); IFAC World Congress 2008, 2001 (5); International Conference on Systems and Computer Science 2012 (1); International Journal of Control (3); International Journal of Robust and Nonlinear Control (3); Journal of Fluid Mechanics (2); Journal of the Franklin Institute (2); Journal of Mathematical Analysis and Applications (3); Journal of Systems Science and Systems Engineering (1); Journal of Theoretical Biology (1); Kybernetika (1); Linear Algebra and Its Applications (1); Mathematical Biosciences (3); Nonlinear Analysis Series B Real World Applications (1); Nonlinear Analysis and Hybrid Systems (1); Nonlinear Analysis and Hybrid Systems Best Paper Award (1); Nonlinear Dynamics (1); International Symposium on Mathematical Theory of Networks and Systems 2014 (1); SIAM Journal on Control and Optimization (10); Southwest Symposium on Systems and Control 2010 (1); Springer (2 books and 1 chapter) Systems and Controls Letters (12); POPL 2013: ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (1).

- Member: IEEE, AIAA, SIAM, SMAI
- Internal Service: Computing Committee (2008-2010). Undergraduate Research (2010-2011) Computing Coordinator (2010-2011). Undergraduate Studies Committee (2010-2011). Dynamics and Controls Curriculum Committee (2012-2016).