GEORGIA INSTITUTE OF TECHNOLOGY
School of Aerospace Engineering

Date: January, 2006   Full Name: Eric Marie Jacques FERON
                                             School of Aerospace

1.   Date of Birth: February 19, 1967

2.   Citizenship: French - permanent resident of the United States of America

3.   Education:

School	Degree	Date
Stanford University	Ph.D.	01/94
Ecole Normale Supérieure	DEA (equivalent M.S.)	09/90
Ecole Polytechnique	B.S.	09/89

4.   Title of Thesis for Most Advanced Degree:

          Linear Matrix Inequalities for the Problem of Absolute Stability of Automatic Control

5.   Principal Fields of Interest:

          System Guidance and Control, optimization with applications to autonomous aerial
          vehicles and air transportation systems and embedded software.

6.   Name and Rank of Other Department Faculty in the Same Field:

          Anthony Calise
          Wassim Haddad
          Eric Johnson
          Panagiotis Tsiotras

7.   Name and Rank of Faculty in Other Departments in the Same Field:

          Arkadiy Nemirovski (ISyE)
          George Vatchevanos (EcE)
          Magnus Egerstedt (EcE)
          Olin Shivers (CoC)
          Allen Tannenbaum (EcE)

8.   Non-GTech Experience:

Employer	Position	Beginning	Ending
Ministry of Defense, France	Engineer	1990	1993
Massachusetts Inst. Technology	Associate Professor	1993	2005

9. History of Academic Appointments:

Rank	Beginning	Ending
Assistant Professor (MIT)	11/93	6/99
Associate Professor (MIT/without tenure)	7/99	6/01
Associate Professor (MIT/with tenure)	7/01	08/05
Professor (GTech/with tenure)	09/05	---

10. Consulting Record:

Firm	Beginning	Ending
ONERA-CERT	05/94	06/94
ONERA-CERT	05/95	06/95
United Technologies	05/95	05/95
ONERA-CERT	05/96	06/96
United Technologies	02/97	04/97
Northwest Airlines	06/00	12/00
Valeo	02/04	02/04
Nascent Technology Corp.	01/02	---

11. Department and Institute Committees, Other Assigned Duties:

Activity	Beginning	Ending
Undergraduate Committee /MIT	09/94	09/95
IAP committee for A/A /MIT	09/94	09/98
Department History & Gardner Lecture/MIT	01/96	08/05
Doctoral Committee/MIT	11/00	08/05
Committee on Operations Research Center/MIT	11/01	08/05
Committee on Computing/GTech Aerospace	09/05	

12. Professional Service:

Committee	Beginning	Ending
Third SIAM Conference on Control Theory and Applications, Technical Committee	09/93	04/95

Reviewer for AFOSR and NRC proposals.	09/93	----
Guest Editor for the International Journal of Robust and Nonlinear Control, special issue on Linear Matrix Inequalities.	09/93	09/96
Guest Editor for the Journal of Ecole Polytechnique, France (equivalent Technology Review), special issue on Air Traffic.	03/97	05/98
Associate Editor, IEEE Transactions on Automatic Control.	10/97	12/00
Technical Committee Program Member, 1999 American Control Conference.	12/97	12/98
ONERA Airport Research Project Evaluation	03/00	03/00
Member, panel on "Future Directions in Control and Dynamical Systems", sub panelist in Aerospace and Transportation. Organized by SIAM.	05/00	07/00
NSF proposal review panel member	06/00	06/00
DARPA/NSF hybrid systems panel member	10/00	10/00
Chairman, IEEE Technical Committee on Robust Control	11/00	11/03
North America Advisor for Académie Nationale des Technologies (French equivalent to National Academy of Engineering)	12/00	----
Technical Committee Program Member, 2002 American Control Conference	12/00	12/01
NSF proposal review panel	04/01	---
Associate Editor, International Journal of Robust and Nonlinear Control	01/02	01/03
Chair, Local arrangements, 2004 ACC	01/02	---
Safety area Program manager, MIT-Ford Alliance	01/02	---
US Girls Scout Aeronautical Instructor	01/02	---

MIT Museum: Participant and Presenter during National Engineers Week. Theme: Stability and Instability	03/02	4/04
Review of several promotion cases (tenure, full) MIT and non-MIT	2001	---
NSF proposal review panel	2003	---
Autonomous Intelligent Network and Systems Conference	2004	---
Abstractions, Robustness and Computations Workshop Upenn co-organizer with Patrick Cousot	2004	---

13.   Awards Received:

Award	Date
Charles Stark Draper Chair	11/93
NSF Research Initiation Award	09/94
NASA Certificate of Recognition	02/98
ONR Young Investigator Award	02/99
Best paper award, Arrival and Departure Management track, 3rd USA/Europe Air Traffic Management R&D Seminar	06/00
Advisor, French Academy of Technologies	01/01
Member, Think Tank 30 Club of Rome (resigned 08/01 for lack of time)	7/01
Best track, session and conference paper award, 2001 Digital Avionics Systems Conference	10/01
Dutton/Ducoffe Professorship	09/05

14.   Current Organization Memberships:

Organization	Offices Held
AIAA	associate fellow
IEEE	member
FEDESPACE	member

15.   Patents and Patent Applications Pending:

"A passive stabilization system for wheeled luggage and other towed wheeled devices" MIT case No. ???

" A Passive Sensor for vehicle Position and attitude estimation using interferometry",
MIT case No. 10323, 6/4/03

"A Passive sensor for vehicle Position and attitude estimation using lenticular sheets"

16.   Professional Registration:

        FAA licensed pilot (private VFR)

17.   Major New Products, Processes, Designs, or Systems:

        Wavetool: A software tool to perform transfer function identification
        via wavelets. (In use at NASA).

        AOCMOD: A discrete-event software simulation of an Airline   Operations Center. (In
        use at United Airlines).

        Autonomous agile helicopter: Product manufactured under MIT license by Nascent
        Technology Corp. and delivered to Oregon Graduate Institute (1 copy) and Lockheed
        Martin Owego (2 copies). Other derivative products: Simulations of small aerobatic
        helicopters.

18.   Press and other non-academic coverage

        Research covered by many daily and periodical, national and international newspapers,
        broadcast media and electronic newsletters, such as the Boston Globe, Slash-dot,
        Aviation Week and Space Technology, Science, Science et Avenir, Air et Cosmos.
        Covereage in the United States, France, Germany, UK, Greece, Italy, Brazil, Russia,
        Hungary and others. Feron's research listed as MIT's only "First" for 2002
        (http://web.mit.edu/newsoffice/special/firsts.html).

Teaching & Educational Contributions of *Eric Feron.*

1. Teaching Experience

Term	Subject Num-ber	Title	Role	Course type	Course evaluation survey given
MIT/ST 94	16.921	Advanced Analysis of Control Systems	Instructor	Lecture	No
FT94	16.060	Principles of automatic control	Recitation Instructor	Lecture	No
ST95	16.410	Intro. to Optimization and Decision Analysis	Instructor	Lecture	No
Su95	16.30S	Practical Methods for Robust Control	Instructor	Lecture	No
FT95	16.338	Nonlinear Aerospace Control Systems	Instructor	Lecture	No
ST96	16.410	Intro. to Optimization and Decision Analysis	Instructor	Lecture	No
FT96	16.31	Feedback Control Systems	Instructor	Lecture	No
IAP97		Aerial Robotics Control	Supervisor	Lecture	No
ST97	16.410	Intro. to Optimization and Decision Analysis	Lectures, in charge	Lecture	No
FT97	16.338	Nonlinear Aerospace Systems	Instructor	Lecture	No
IAP 98		Aircraft Pilot Ground School	Supervisor	Lecture	No
ST98	16.410	Intro. to Optimization and Decision Analysis	Instructor	Lecture	No
FT98	16.31	Feedback Control Systems	Instructor	Lecture	No
IAP99		Aircraft Pilot Ground School	Supervisor	Lecture	No
IAP99		Logan Airport Tower Visit	Supervisor	Lecture	No
ST99	16.410	Intro. to Optimization and Decision Analysis	Instructor	Lecture	No
FT99	16.338	Nonlinear Aerospace Systems	Instructor	Lecture	No
IAP00		Aircraft Pilot Ground School	Supervisor	Lecture	No
ST00	16.410	Intro. to Optimization and Decision Analysis	Instructor	Lecture	No

ST01	16.30	Estimation and Control of Aerospace Systems	Instructor	Lecture	Yes
ST01	16.410	Principles of Automated Reasoning and Decision Making	Instructor	Lecture	Yes
FT01	6.251/ 15.081	Introduction to Linear Programming/Operations Research	Instructor	Lecture	Yes
IAP02	16.900	Intro. to computational methods in Engineering	Instructor	Lecture	Yes
ST02	16.30	Estimation and Control of Aerospace Systems	Instructor	Lecture	Yes
ST02	16.410	Principles of Automated Reasoning and Decision Making	Instructor	Lecture	Yes
FT 02	6.242	Control of Complex Dynamical Systems	Guest Instructor	Lecture	Yes
FT03	16.31	Feedback Control Systems	Instructor	Lecture	Yes
IAP04	16.900	Intro. to computational methods in Engineering	Instructor	Lecture	Yes
ST04	16.30	Estimation and Control of Aerospace Systems	Instructor	Lecture	Yes
GTech/ FT 05	AE 4508	Analysis of Computer Programs	Instructor	Lecture	No
GTech/ ST 06	AE 3515	System Dynamics	Instructor	Lecture	?
ST06	AE 4525	Control Systems Lab	Instructor	Lecture	?

2. Other Educational Contributions

Student supervisor, International Aerial Robotics Contest team. (Ranked second, 1997, best paper presentation, 1998, best oral presentation (by club president, Paul Eremenko), AIAA student conference, April 1999).

Publications of Eric Feron

1. Books

1. <u>Linear Matrix Inequalities in System and Control Theory</u>, by Boyd, S., El Ghaoui, L., Feron, E., and Balakrishnan, V., vol. 15 in Series in Applied Mathematics, SIAM, June 1994.
2. <u>General Theory of Algebraic Equations,</u> by E. Bezout, translation from French by E. Feron. Princeton University Press, 2006. Original publication date: 1779.

2. Proceedings of Refereed Journals

1. Feron, E., "Analysis of Robust H_2 Performance Using Multiplier Theory," *SIAM Journal of Control and Optimization*, vol. 35, no. 1, pp. 160-177, January 1997.

2. Feron, E., Apkarian, P., and Gahinet, P., "Analysis and Synthesis of Robust Control Systems via Parameter-Dependent Lyapunov Functions," *IEEE Trans. on Automatic Control*, vol. 41, no. 7, pp. 1041-1046, July 1996.

3. Feron, E., "A More Reliable Robust Stability Indicator for Linear Systems Subject to Parametric Uncertainties," *IEEE Trans. on Automatic Control*, vol. 42, no. 9, pp. 1326-1330, September 1997.

4. Boussios, C. and Feron, E., "Estimating the Conservatism of Popov's Criterion for Real Parametric Uncertainties", *Systems and Control Letters*, pp. 173-183, August 1997.

5. Feron, E., Brenner, M., Paduano, J., and Turevskiy, A., "Time-Frequency Analysis for Transfer Function Estimation and Application to Flutter Clearance", in *AIAA J. on Guidance, Control and Dynamics ,* vol. 21, no. 3, pp. 375—382, May - June 1998. **

6. McConley, M. W., Appleby, B. D., Dahleh, M. A., and Feron, E., "Computational Complexity of Lyapunov Stability Analysis Problems for a Class of Nonlinear Systems", *SIAM Journal of Control and Optimization*, vol. 36, no. 6, pp. 2176-2193, November 1998. **

7. Shewchun, J. M. and Feron, E., "High Performance Control with Position and Rate Limited Actuators", *Int. J. Robust and Nonlinear Control*, special issue on saturating systems, vol. 9, pp. 617-630, July 1999. **

8. McConley, M. W., Appleby, B. D., Dahleh, M. A., and Feron, E., "Polytopic Lyapunov Functions for Robust Stabilization of a Class of Nonlinear Systems", in *Systems and Control Letters*, pp. 77—85, May 1998. **[1]

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9. McConley, M.W., Appleby, B. D., Dahleh, M. A., and Feron, E., "A Computationally Efficient Lyapunov-Based Scheduling Procedure for Control of Nonlinear Systems with Stability Guarantees", *IEEE Trans. Aut. Control*, Jan 2000. **

10. Turevskiy, A., Feron, E., and Paduano, J., "Combining Physical Models and Experimental Data for Flutter Boundary Prediction", *AIAA J. on Guidance, Control and Dynamics,* vol. 22, no. 1, January-February 1999. **

11. Oh, J.H., Jamoom, M., McConley, M. and Feron, E, "Solving Control Allocation Problems using Semidefinite Programming", *AIAA J. on Guidance, Control and Dynamics,* vol. 22, no. 3, May-June 1999. **

12. Pujet, N. and Feron, E., "Modeling an Airline Operations Control Center", *Air Traffic Control Quarterly*, vol 7, no. 4,1999.**

13. Idris, H. *et al.* "Observation of Departure Processes at Logan Airport to Support the Development of Departure Planning Tools", *Air Traffic Control Quarterly,* vol 7, no. 4, 1999. **

14. Pujet, N., Delcaire, B. and Feron, E., "Identification and Control of the Departure Process at Busy Airports", *Air Traffic Control Quarterly,* vol 8, no. 1, 2000**

15. Frazzoli, E., Mao, Z.-H., Oh, J. and Feron, E.. "Resolution of Conflicts Involving many Aircraft via Semidefinite Programming", *AIAA J. on Guidance, Control and Dynamics,* 2001.**

16. Mao , Z.-H., Feron, E. and Bilimoria, K. "Stability and Performance of Intersecting Aircraft Flows under Sequential Conflict Resolution", accepted for publication in Special Air Traffic Control issue of *IEEE Trans. Intelligent. Transportation Systems.* 2001.**

17. Gavrilets, V., Dahleh, M. and Feron, E. "Avionics system for a small unmanned helicopter performing aggressive maneuvers", *IEEE Aerospace and Electronic Systems Magazine*, Sept 2001.**

18. Frazzoli, E, Dahleh, M. and Feron, E. "Real-Time Motion Planning for Agile Autonomous Vehicles", in *AIAA J. on Guidance, Control and Dynamics*, pp 116—129 , No. 1, Vol. 25, Jan-Feb 2002.**

19. Gavrilets, V. , Frazzoli, E., Mettler, B. , Piedmonte, M. , Feron, E. "Aggressive Maneuvering of Small Helicopters: A Human-Centered Approach", *International Journal on Robotics Research*, Vol. 20, Number 10, Oct. 2001. **

20. L. Pallottino, E. Feron, and A. Bicchi. Conflict Resolution Problems for Air Traffic Management Systems Solved with Mixed Integer Programming. *IEEE Trans. Intelligent Transportation Systems,* 3(1):3-11, March 2002.

21. Andersson, K., Hall, W., Atkins, S. and Feron, E., "Optimization-Based Analysis of Collaborative Airport Arrival Planning", *Transportation Science*, 2004.**

22. A. Richards, J. How, T. Schouwenaars and E. Feron, "Spacecraft trajectory planning with collision and plume avoidance", *AIAA J. on Guidance, Control and Dynamics*, Vol. 25, no. 4, pp. 755-64, 2002.**

23. V. Gavrilets, B. Mettler, and E. Feron, "Human-Inspired Control Logic for Automated Maneuvering of Miniature Helicopter", in *AIAA J. on Guidance, Control and Dynamics*, 2004.**

24. B. Mettler, C. Dever, and E. Feron, "Scaling Effects and Dynamic Characteristics of Miniature Rotorcraft", *AIAA J. Guidance, Control and Dynamics,* 2004.**

25. Carr, F. , Theis, G., Clarke, J-P and Feron, E. "Evaluation of Improved Pushback Forecasts Derived from Airline Ground Operations Data", accepted for publication, *AIAA Journal Journal of Aerospace Computing, Information, and Communication*, 2004.**

26. Schouwenaars, Mettler, Feron, How. "Hybrid Model for Trajectory Planning of Agile Autonomous Vehicles", to appear, *AIAA Journal of Aerospace Computing, Information and Communication, january 2005.**

27. Dever, Mettler, Feron, Popovic, McConley. "Trajectory Interpolation for Parametrized Maneuvering and Flexible Motion Planning of Autonomous Vehicles", *AIAA J. of Guidance, Control and Dynamics, 2006.**

28. Mao, Z.H., Dugail, D. and Feron, E. "Stability of intersecting aircraft flows under heading changes" IEEE Trans. On Intelligent Transportation Systems, 2006.

29. Frazzoli, E., Dahleh, M. and Feron, E. "Maneuver-based Motion Planning for Nonlinear Systems with Symmetries" ,*IEEE Trans. on Robotics*, 2005.

30. T. Schouwenaars, M. Valenti, E. Feron, J. How and E. Roche "Linear Programming and Language Processing for Human/Unmanned-Aerial-Vehicle Team Missions", *AIAA Journal on Guidance, Control and Dynamics, 2006.*

31. T. Schouwenaars, A. Stubbs, J. D. Paduano and Eric Feron: "Multi-Vehicle Path Planning for Non-Line of Sight Communication", Journal of Field Robotics, 2006.

3. Proceedings of Refereed Conferences

1. Feron, E. and Olivier, C., "Multi-captor multi-target filtering using fractal theory and Kalman filtering," in <u>Proceedings of the IEEE Conf. on Dec. and Control</u> , Hawaii, Dec. 1990.

2. Olivier, C., Dessoude, O. and Feron, E., "Stealth Filtering with Reduced-Order Observations.", in <u>Proceedings of the IEEE Conf. On Dec. and Control,</u> pp 3060—3067, Brighton, UK, Dec. 1991.

3. Balakrishnan, V., Feron, E., Boyd, S., and El Ghaoui, L., "Computing bounds for the structured singular value via an interior point algorithm," in <u>Proceedings of the American Control Conference</u>, vol. 3, pp. 2195-2196, Chicago, IL, June 1992.

4. Balakrishnan, V., Feron, E., Boyd, S., and El Ghaoui, L., "Solving interpolation problems via generalized eigen value minimization," in <u>Proceedings of the American Control Conference</u>, vol. 3, pp. 2647-2648, San Francisco, CA, June 1993.

5. Feron, E., Balakrishnan, V., and Boyd, S., "Design of stabilizing state feedback for delay systems via convex optimization," in <u>Proceedings of IEEE Conference on Decision and Control</u>, vol. 1, pp. 147-148, Tucson, AZ, December 1992.

6. Feron, E., Balakrishnan, V., Boyd, S., and El Ghaoui, L., "Numerical methods for H_2 related problems, in <u>Proceedings of the American Control Conference</u>, vol. 4, pp. 2921-2922, Chicago, IL, June 1992.

7. El Ghaoui, L., Balakrishnan, V, Feron, E., and Boyd, S., "On maximizing a robustness measure for structured nonlinear perturbations," in <u>Proceedings of the American Control Conference</u>, vol. 4, pp. 2923-2924, Chicago, IL, June 1992.

8. Boyd, S., Balakrishnan, V., Feron, E., and El Ghaoui, L., "Control System Analysis and Synthesis via Linear Matrix Inequalities," in <u>Proceedings of the American Control Conference</u>, vol. 2, pp. 2147-2154, San Francisco, CA, June 1993.

9. Boyd, S., Feron, E., Balakrishnan, V., and El Ghaoui, L., "History of Linear Matrix Inequalities in Control Theory," in <u>Proceedings of the American Control Conference</u>, vol. 1, pp. 31-34, Baltimore, MD, June 1994.

10. Feron, E., "Observer-based stabilization of nonlinear systems," in <u>Proceedings of the American Control Conference</u>, vol. 1, pp. 436-439, Baltimore, MD, June 1994.

11. Feron, E., "Analysis of robust H_2 performance with multipliers," in Proceedings of the Conference on Decision and Control, vol. 3, pp. 2015-2020, Orlando, FL, December 1994.

12. Apkarian, P., Feron, E., and Gahinet, P., "A Parameter-Dependent Lyapunov Approach to Robust control with Parametric Uncertainty," in Proceedings of the European Control Conference, Rome, Italy, September 1995.

13. Feron, E., Apkarian, P., and Gahinet, P., "S-procedure for the Analysis of Control Systems via Parameter-Dependent Lyapunov Functions," in Proceedings of the European Control Conference, Rome, Italy, September 1995.

14. Feron, E., "Robustness of Linear Systems Against Parametric Uncertainties: Towards Consistent Stability Indicators," in Proceedings of the IEEE Conference on Decision and Control, vol. 2, pp. 1425-30, New Orleans, LA, December 1995.

15. Miotto, P., Shewchun, M., Paduano, J., and Feron, E., "High Performance Bounded Control and Application to the F18-HARV", in Proceedings of the AIAA Conference on Guidance, Navigation and Control, San Diego, CA, August 1996. **[2]

16. Boussios, C. and Feron, E., "Estimating the conservatism of Popov's Criterion", in Proceedings of the AIAA Conference on Guidance, Navigation and Control, San Diego, CA, August 1996.

17. Duchesne, L., Brenner, M., Feron, E., and Paduano, J., "Subspace Identification with Multiple Data Sets", in Proceedings of the AIAA Conference on Guidance, Navigation and Control, San Diego, CA, August 1996. **

18. Pujet, N. and Feron, E., "Flight Plan Optimization in Flexible Air Traffic Environments", in Proceedings of the AIAA Conference on Guidance, Navigation and Control, San Diego, CA, August 1996. **

19. Shewchun, M. and Feron, E., "High Performance Bounded Control", in American Control Conference, vol. 5, pp. 3250-3254, July 1997. **

20. McConley, M., Appleby, B., Dahleh, M., and Feron, E., "Polytopic Control Lyapunov Functions for Robust Stabilization of a Class of Nonlinear Systems", in American Control Conference, July 1997. **

21. McConley, M., Appleby, B., Dahleh, M., and Feron, E., "A Control Lyapunov Function Approach to Robust Stabilization of Nonlinear Systems", in American Control Conference, July 1997. **

** Outgrowth of supervised student research

22. Paganini, F. and Feron, E., "Analysis of Robust H_2 Performance: Comparisons and Examples", <u>IEEE Conference on Decision and Control</u>, vol. 2, pp. 1000-1005, San Diego, CA, December 1997.

23. Yang, K. Y., Hall, S. R., and Feron, E., "A New Design Method for Robust H_2 Controllers using Popov Multipliers", in <u>American Control Conference</u>, vol. 2, pp. 1235-1240, July 1997. **

24. Miotto, P., Paduano, J., Feron, E., and Burken, J., "Modern Fixed Structure Control Design Part I: Gain Adjustment to Improve Handling Qualities", in <u>Proceedings of the AIAA Conference on Guidance, Navigation and Control</u>, August 1997. **

25. Miotto, P., Paduano, J., Feron, E., and Burken, J., "Modern Fixed Structure Control Design Part II: Automated Gain Scheduling", in <u>Proceedings of the AIAA Conference on Guidance, Navigation and Control</u>, August 1997. **

26. Shewchun, M. and Feron, E., "High Performance Control of Systems Subject to Input and Input Rate Constraints", in <u>AIAA GNC Conference</u>, August 1997. **

27. Shewchun, M., Oh, J.-H., and Feron, E., "Linear matrix inequalities for analysis of free flight conflict problems", in <u>IEEE Conf. on Decision and Control</u>, vol. 3, pp. 2417-2422, San Diego, CA, December 1997. **

28. Oh, J.-H., Shewchun, M., and Feron, E., "Design and Analysis of Conflict Resolution Algorithms via Positive Semidefinite Programming", <u>IEEE Conf. on</u> <u>Decision and Control</u>, vol. 5, pp. 4179-4185, San Diego, CA, December 1997.

29. Oh, J.H. and Feron, E., "Primal-Dual Quadratic Programming Approach to Multiple Conflict Resolution", in <u>American Control Conference,</u> vol. 5, pp. 2802-2806, Philadelphia, PA, July 1998.

30. Oh, J. H. and Feron, E., "Safety Certification of Air Traffic Conflict Resolution Algorithms Involving More Than Two Aircraft", in <u>American Control Conference</u>, vol. 5, pp. 2807-2811, Philadelphia, PA, July 1998.

31. Pujet, N., Feron, E., and Rakhit, A., "Modeling of an Airline Operations Control Center as a Queuing Network", in <u>American Control Conference,</u> vol. 3, pp. 1800-1803, Philadelphia, PA, July 1998. **

32. Idris, H., *et al.* , "Identification of Flow Constraint and Control Points in Departure Operations at Airport Systems", <u>AIAA Guidance, Navigation and Control Conference</u>, August 1998. **

33. Pujet, N., Feron, E., and Rakhit, A., "Modeling and Identification of an Airline Operations Center as a Multi-Agent Queueing System", <u>AIAA Guidance, Navigation and Control Conference</u>, August 1998. **

34. Budge, A., George, S., Covert, E. and Feron, E., "Modeling of non axisymmetric projectiles", AIAA 1998, Boston, MA.**[3]

35. Pujet, N. and Feron, E., "Modeling an Airline Operations Control Center", <u>International Air Traffic Management R&D seminar ATM-98,</u> Orlando, FL, December 1998.

36. Jamoom, M. B., Feron, E., and McConley, M. W., "Optimal Actuator Control Grouping Schemes", <u>IEEE Conf. on Decision and Control</u>, December 1998. **

37. Paganini, F. and Feron, E., "Analysis of Robust H2 Performance: Comparisons and Examples", <u>IEEE Conf. on Decision and Control</u>, December 1998.

38. Sanders, C. P., Debitetto, P. A., Feron, E., Vuong, H.-F. and Leveson, N., "Hierarchical Control of Small Autonomous Helicopters", <u>IEEE Conf. on Decision and Control</u>, December 1998. **

39. McGovern, L. and Feron, E., "Requirements and Hard Computational Bounds for Real-Time Optimization in Safety-Critical Control Systems", <u>IEEE Conf. on Decision and Control</u>, December 1998. **

40. Idris, H. , Delcaire, B., Hall, W., Anagnostakis, I., Hansman, R.J., Feron, E., and Odoni, A.R., "Observation of Departure Processes at Logan Airport to Support the Development of Departure Planning Tools", <u>2nd USA/Europe Air Traffic Management R&D seminar,</u> Orlando, FL, December 1998. **

41. Pujet, N. and Feron, E., "Input-output Modeling and Control of the Departure Process of Busy Airports", <u>AIAA Conference on Guidance, Navigation and Control,</u> Portland, OR, August 1999.**

42. Frazzoli, E., Dahleh, M.A. and Feron, E. "A hybrid control architecture for aggressive maneuvering of autonomous helicopters", <u>IEEE Conf. On Decision and Control,</u> December 1999.**

43. Piedmonte M. and Feron, E. "Aggressive Maneuvering of Autonomous Aerial Vehicles: A Human-Centered Approach", <u>9th Int. Symposium on Robotics Research</u>. October 9-12, 1999. Snowbird, Utah, USA.

**Outgrowth of supervised student research

44.   Frazzoli, E., Dahleh, M.A. and Feron, E. "Trajectory tracking control design for autonomous helicopters using a backstepping algorithm", <u>American Control Conference</u>, June 2000, Chicago, IL.**[4]

45.   Andersson, K., Carr, F., Feron, E. and Hall, W. "Analysis of Arrival and Departure Ground Operations at Hub Airports", <u>FAA-Eurocontrol Air Traffic Management Research Seminar</u>, June 2000, Naples, Italy.**

46.   Anagnostakis, I., Idris, H., Clarke, J.-P., Feron, E., Hansman, R.J., Odoni, A. and Hall, W. "A Conceptual Design of a Departure Planner Decision Aid", <u>FAA-Eurocontrol Air Traffic Management Research Seminar</u>, June 2000, Naples, Italy. Best paper award, Airport, Ground Operations, Arrival and Departure Management track.**

47.   Mao, Z.-H., Feron, E. and Bilimoria, K. "Stability and Performance of Intersecting Aircraft Flows under Decentralized Conflict Avoidance Rules", <u>AIAA Conference on Guidance, Navigation and Control,</u> Denver, CO, August 2000.**

48.   Mao, Z.-H., Feron, E., Bilimoria, K. and Lee, H.-Q. "Comparison of Centralized and Decentralized Conflict Resolution Strategies for Multiple-Aircraft Problems", <u>AIAA Conference on Guidance, Navigation and Control,</u> August 2000.**

49.   Frazzoli, E., Dahleh, M.A. and Feron, E. "Real-time Motion planning for agile autonomous vehicles", <u>AIAA Conf. on Guidance, Navigation and Control</u>, Denver, CO, August 2000.**

50.   E. Frazzoli, M. Dahleh and E. Feron, "Robust Hybrid Control for Autonomous Vehicle Motion Planning", <u>IEEE Conference on Decision and Control,</u> Sydney, Australia, December 2000.**

51.   S. Gentry, S. Venkatesh and E. Feron, "Inverse Constrained Optimal Control", <u>American Control Conference,</u> Arlington, VA, June 2001**.

52.   E. Frazzoli, M. Dahleh and E. Feron, "Randomized guidance for Autonomous Vehicle Motion Planning", to be presented at <u>American Control Conference,</u> Arlington, VA, June 2001**.

53.   Z. H. Mao and E. Feron "New conditions for stability of intersecting aircraft flows under sequential resolution rules", to be presented at <u>American Control Conference,</u> Arlington, VA, June 2001**.

**Outgrowth of supervised student research

54. V. Gavrilets, B. Mettler and E. Feron "Nonlinear Model for a Small-Size Acrobatic Helicopter", to be presented at <u>AIAA Guidance, Navigation and Control Conference,</u> Montreal, Canada, August 2001.

55. D. Dugail, Z.H. Mao and E. Feron "Stability of Intersecting Aircraft Flows under Centralized and Decentralized Conflict Avoidance Rules", <u>AIAA Guidance, Navigation and Control Conference,</u> Montreal, Canada, August 2001.

56. A. Smith, T. Schouwenaars, J. How and E. Feron "Plume Avoidance Maneuver Planning Using Mixed Integer Linear Programming", <u>AIAA Guidance, Navigation and Control Conference,</u> Montreal, Canada, August 2001.

57. L. Pallottino, A. Bicchi and E. Feron "Mixed integer programming for aircraft conflict resolution", to be presented at <u>AIAA Guidance, Navigation and Control Conference,</u> Montreal, Canada, August 2001.

58. E. Frazzoli, M. Dahleh and E. Feron "Experiments on using robust hybrid automaton for real-time vehicle path planning", to be presented at <u>AIAA Guidance, Navigation and Control Conference,</u> Montreal, Canada, August 2001.

59. Sprague, K., Gavrilets, V. Dugail, D., Mettler, B. Feron, E., Martinos, I. "Design and application of an avionics systems for a miniature acrobatic helicopter. Space-Aviation's next frontier; Proceedings of the 20th Digital Avionics Conference, Vol 1, Daytona Beach, FL, Oct 14-18, 2001, Piscataway, NJ IEEE, 2001.

60. T. Schouwenaars, B. De Moor, E. Feron and J. How, "Mixed Integer Programming for Multi-Vehicle Path-Planning", European Control Conference, Porto, Portugal, September 2001.

61. Dugail D. and E. Feron, "Stability of Intersecting Aircraft Flows Using Heading Change Maneuvers," Proceedings of 2002 American Control Conference, IEEE 2002.

62. Carr and Feron, "Modeling and Control of Airport Queuing Dynamics under Severe Flow Restrictions," Proceedings of 2002 American Control Conference, IEEE 2002.

63. Dugail Feron and Bilimoria, "Conflict-free Conformance to en route flow rate constraints," AIAA Guidance, Navigation, and Control conference and Exhibit, Monterey, CA Aug 5-8, 2002. B. Mettler, V. Gavrilets and Eric Feron, Flight-Test Evaluation of a Dynamic

64. Compensation for High-Bandwidth Control of a Small-Scale Helicopter, American Helicopter Society, Test and Evaluation Technical Specialists Meeting, San Francisco, CA, Jan. 2002.

65. Gavrilets, V., Martinos, I., Mettler, B. and Feron, E., "Control Logic for Automated Aerobatic Flight of a Miniature Helicopter", AIAA Guidance, Navigation and Control Conference, Monterey, CA, August 2002.

66. Mettler, Valenti, Schouwenaars and Feron, "Rotorcraft Motion Planning for Agile Maneuvering Using a Maneuver Automaton", AHS 2002.

67. De Mot, Kulkarni V., Gentry, Gavrilets and Feron, "Cooperative Path Planning of UAV Clusters", AINS 2002 May, UCLA.

68. V. Gavrilets, I. Martinos, B. Mettler and E. Feron, Aggressive Maneuvering Flight Tests of a Miniature Robotic Helicopter, 8th International Symposium on Experimental Robotics (ISER), Sant'Angelo d'Ischia, Italy, July 2002.

69. DeMot, Gentry, Kulkarni and Feron: Stochastic path planning CDC2002.

70. V. Gavrilets, I. Martinos, B. Mettler and E. Feron "Flight test and Simulation results for an autonomous aerobatic helicopter", 2002 DASC

71. Schouwenaars, How, Feron, "Safe Receding Horizon Path Planning for Autonomous Vehicles" ,Allerton 2002.

72. Carr, F., Evans, A., Feron, E. and Clarke, J.-P. " Software Tools to Support Research on Airport Departure Planning", XXI DASC, Irvine, CA. Best paper in Session Award.

73. Mitra, S., Wang, Y., Lynch, N. and Feron, E. "Safety Verification of Model Helicopter Controller using Hybrid Input/Output Automata" , HSCC 2003.

74. Lee Yang, Ji Hyun Yang, Eric Feron, Vishwesh Kulkarni "Development of a Performance-Based Approach for a Rear-End Collision Warning and Avoidance System for Automobiles" 2003 IEEE Intelligent Vehicles Symposium, Columbus, OH.**

75. Tom Schouwenaars, Bernard Mettler, Eric Feron, Jonathan P. How, " Hybrid Architecture for Full-Envelop Autonomous rotorcraft guidance," American Helicopter Society 59th Annual Forum, May 6-8, 2003.

76. Tom Schouwenaars, Bernard Mettler, Eric Feron, Jonathan P. How, "Guidance of autonomous vehicles with uncertain dynamics" American Control Conference, 2003.**

77. T. Schouwenaars, E. Feron, J. How: "Robust Motion Planning Using a Maneuver Automaton with Built-in Uncertainties", 2003 American Control Conference, Denver, CO

78. Jan De Mot and Eric Feron. "Spatial Distribution of Two-Agent Clusters for Efficient Navigation," 42nd IEEE Conference on Decision and Control, Hawaii Dec. 2003**

79.   B. Mettler, C. Dever, E Feron. "Scaling Effects and Dynamic Characteristics of Miniature Rotorcraft", 2003.**

80.   T. Schouwenaars, B. Mettler, J. How, E. Feron. " Robust Motion Planning Using a Maneuver Automation with Built-in Uncertainies, ACC2003.**

81.   T. Schouwenaars, B. Mettler, J. How, E. Feron. "Hybrid Architecture for full-envelope autonomous rotorcraft guidance. ACC 2003**

82.   Mettler, B., Valenti,M., Schouwenaars, T, Kuwata, Y, How, J., Paunicka, J., Feron, E. "Autonomous UAV Guidance Build-up: Flight –Test Demonstration and Evaluation Plan, AIAA Guidance, Navigation, and Control conference and Exhibit, Austin TX Aug 11-14, 2003.

83.   De Mot, J., and E. Feron, "Spatial Distribution of Two-Agent Clusters for Efficient Navigation," CDC 2003.

84.   T. Schouwenaars, J. How, E. Feron: "Receding Horizon Path Planning with Implicit Safety Guarantees", 2004 American Control Conference, Boston, MA,

T.
85.   Chakravarthy, A., Song, K., E. Feron, " A GPS Based slowdown warning system for safe automobiles." IEEE Intelligent Vehicles Symposium, June 14-17, 2004.

86.   Dever, Mettler, Feron, 2004 AIAA GNC, 2004.

87.   Craparo, Berwick and Feron, 2004 AIAA GNC, 2004.

88.   T. Schouwenaars, B. Mettler, J. How and E. Feron, "HYBRID MODEL FOR RECEDING HORIZON GUIDANCE OF AGILE AUTONOMOUS ROTORCRAFT″. 2004 IFAC Aerospace Systems Symposium, St Petersburg, Russia.**

89.   Eric Feron and Jim Paduano, "A passive Sensor for Position and Attitude Estimation Using an Interferometric Target", 43rd IEEE Conference on Decision and Control December 14-17, 2004, Atlantis, Paradise Island, the Bahamas.

90.   Roozbehani, Feron and Megretski: "Modeling, Optimization and Computation for Software Verification", Hybrid Systems, Computation and Control Conference, Zurich, March 2005. To appear in LNCS, Springer Verlag, 2005.

91.   Roozbehani, Feron and Megretski: "Convex Optimization proves Software Correctness", American Control Conference, May 2005.

92.   DeMot, J. and Feron, E.: "Optimal Agent Cooperation: How many is enough?", Allerton Conference on Communication, Control and Computing, 2005.

93. Le Ny, J. and Feron, E.: "An approximation algorithm for the curvature-constrained traveling salesman problem", Allerton Conference on Communication, Control and Computing, 2005.

94. Joseph, F. A. and Feron, E.: "Computing the Optimal Strategy for Various Ambush Games", Allerton Conference on Communication, Control and Computing, 2005.

95.

4.   Other Major Publications

<u>Book Chapters:</u>
1.   Apkarian, P. and Feron, E. "Robust Control System Analysis and Synthesis via Parameter-Dependent Lyapunov Functions", in <u>Progrès récents en commande Robuste</u>, Jacques Bernussou, Ed. Editions Hermès. 1996.

2.   Yang, K., Hall, S.R. and Feron, E. "Robust **H**2 Control", in <u>Recent Advances on Linear Matrix Inequality Methods in Control</u>, L. El Ghaoui and S. Niculescu, Eds. SIAM, 2000.**

3.   Paganini, F. and Feron, E. "LMI Methods for Robust **H**2 Analysis: A Survey with Comparisons", in <u>Recent Advances on LMI Methods in Control</u>, L. El Ghaoui and S. Niculescu, Eds. Book to be published by SIAM, 2000.

4.   Feron, E. "Nonconvex Quadratic Programming, Semidefinite Relaxations and Randomization Algorithms in Information and Decision Systems", in <u>System Theory: Modeling, Analysis and Control</u>, T. Djaferis and I. Schick, Eds. pp 255—274. Kluwer Academic Publishers, 1999.

5.   Frazzoli, E. and Dahleh, M. and Feron, E. "A Hybrid Control Architecture for Aggressive Maneuvering of Autonomous Aerial Vehicles", in <u>System Theory: Modeling, Analysis and Control</u>, T. Djaferis and I. Schick, Eds. pp 325—251. Kluwer Academic Publishers, 1999. **

6.   Piedmonte, M. and Feron, E. "Aggressive Maneuvering of Autonomous Aerial Vehicles: A Human-Centered Approach", in <u>Robotics Research,</u> J. Hollerbach and D. Koditschek Eds. pp. 374—380. Springer-Verlag, 2000.

7.   Pujet, N. and Feron, E., "Modeling an Airline Operations Control Center", to appear in <u>Air Transportation Systems Engineering,</u> G. Donohue and A. Zellweger Eds, American Institute of Aeronautics and Astronautics.

8.   Andersson, K., Carr, F., Hall, W. and Feron, E. "Analysis and Modeling of Ground Operations at Hub Airports", t <u>Air Transportation Systems Engineering,</u> G. Donohue and A. Zellweger Eds., American Institute of Aeronautics and Astronautics.

9.   Anagnostakis, I., Idris, H., Clarke, J.-P., Feron, E., Hansman, R.J., Odoni, A. and Hall, W. "A Conceptual Design of a Departure Planner Decision Aid", <u>Air Transportation Systems Engineering,</u> G. Donohue and A. Zellweger Eds., American Institute of Aeronautics and Astronautics.

10. Craparo, E., Sheng-Ho Chang, F., Lee, J.W., Berwick, R. and Feron, E. "Natural Language Processing in Control of Unmanned Aerial Vehicles", <u>Theory and Algorithms for Cooperative Systems,</u> Don Grundel, Rob Murphey, Panos Pardalos, Eds., Kluwer.

<u>Other Major Publications</u>
11. Boyd, S., El Ghaoui, L., Feron, E., and Balakrishnan, V., "Linear matrix inequalities in system and control theory," in <u>Proceedings Annual Allerton Conference on Communication, Control and Computing</u>, pp. 237-246, October 1993.

12. McConley, M., Appleby, B., Dahleh, M., and Feron, E., "A Control Lyapunov Function Approach to Robust Stabilization of Nonlinear Systems", in <u>Allerton Conference</u>, pp. 372-381, Monticello, IL, October 1996. **

13. Brenner, M. and Feron, E., "Wavelet Analyses of F/A-18 Aeroelastic and Aeroservoelastic Flight Test Data", <u>38th AIAA Structures, Structural Dynamics, and Materials Conference</u>, Kissimmee, FL, April 1997.

14. Brenner, M. and Feron, E., "Wavelet Analysis of Flight-Test Data on Aeroelasticity: Wavelet analysis offers advantages over Fourier analysis", NASA Tech Briefs, December 1997.

15. Turevskiy, A. and Feron, E., "Flutter Boundary Prediction with Experimental Data", <u>2nd International Conf. on Non Linear Problems in Aviation and Aerospace</u>, Miami, FL, May 1998. **

16. Pélegrin, M., Feron, E., and Delcaire, B., "L'Aéroport Bloquera-t-il le Développement du Transport Aérien?", (*Will the airport be the bottleneck of Air Transportation Growth?),* in *La Jaune et la Rouge*, E. Feron and M. Pélegrin Eds. May 1998. **

17. El Ghaoui, L. and Feron, E. "A New Convex Relaxation for Robust Stability and H2 Performance Analysis of Linear Systems subject to Parametric Uncertainties", <u>Allerton Conference</u>, Monticello, IL, September 1999.

18. Gavrilets, V., Shterenberg, A., Dahleh, M. and Feron, E., "Avionics System for a Small Unmanned Helicopter Performing Aggressive Maneuvers", <u>Digital Avionics Systems Conference</u>, Philadelphia, PA, October 2000.

19. McConley, M., Applepy, B., Frazzoli, E., Feron, E. and Dahleh, M. A., "Hybrid Control for Aggressive Maneuvering of Autonomous Aerial Vehicles", <u>Digital Avionics Systems Conference</u>, Philadelphia, PA, October 2000.

20. Gentry, S., Saligrama, V. and Feron, E., "Identification of Receding Horizon Controllers: An Extension to the Inverse Problem of Optimal Control", <u>Allerton Conference,</u> Monticello, IL, October 2000.

21. Frazzoli, E., Dahleh, M., Feron, E., "Real-Time Motion Planning for Autonomous Vehicles", <u>Allerton Conference,</u> Monticello, IL, October 2000.

22. Gavrilets, V. , Martinos, I., Dugail, D K. Sprague, B. Mettler, E. Feron "Control architecture for a Small Unmanned Helicopter Performing Aggressive Maneuvers", Digital Avionics Systems Conference, 2001. **Best conference paper award.**

23. De Mot, J. and Feron, E. "Performance of Multiple Agents in an Unknown Environment", <u>Allerton Conference on Control, Systems and Communications,</u> University of Illinois Urbana-Champaign, October 2001.

24. Martinos, De Mot, Schouwenaars and Feron, Allerton Conference, 2003.

5.   Internal Memoranda and Progress Reports

1. Feron, E., "Quadratic Stabilizability of Switched Systems via State and Output Feedback", MIT Center for Intelligent Control Systems Report, CICS-P-468. 1996.

2. Paternot, X., "F18-SRA analysis via Wavelets and Identification", MIT Laboratory for Information and Decision Systems Report, 1996. **

3. Odoni, A., Bowman, J., Delahaye, D., Deyst, J., Feron, E., Hansman, R.J., Khan, K., Kuchar, J., Pujet, N., and Simpson, R., "Existing and Required Modeling Capabilities for Evaluating ATM Systems and Concepts," MIT International Center for Air Transportation Report #ICAT-98-2, March 1997.

4. Feron, E. *et al.* "The Departure Planner: A Conceptual Discussion". MIT internal report. International Center for Air Transportation, December 1997.

5. Delcaire, B. and Feron, E. "Dealing with Airport Congestion: Development of Tactical Tools for the Departure Flows from a Large Airport", MIT International Center for Air Transportation # ICAT-98-3, June 1998.**

6. Pujet, N. and Feron, E. "Input-Output Modeling and Control of the Departure Process of Busy Airports", MIT International Center for Air Transportation #ICAT-99-4, January 1999.**

7. Frazzoli, E., Mao, Z.-H., Oh, J.-H, and Feron, E. "Semidefinite Approach to Multi-Aircraft Conflict Resolution", MIT Int. Center for Air Transportation, #ICAT-99-5, April 1999.**

8. Frazzoli, E. , Dahleh, M. and Feron, E. "Aggressive Maneuvering for Small Autonomous Helicopters", MIT LIDS Report, #LIDS-2507, April 1999.**

9. Piedmonte, M. and Feron, E. "Aggressive maneuvering of Small Autonomous Aerial Vehicles: A Human-Centered Approach", MIT LIDS Report, #LIDS-2500, April 1999.

10. El Ghaoui, L. and Feron, E. "A New Convex Relaxation for Robust Stability and H2 Performance Analysis of Linear Systems subject to Parametric Uncertainties", MIT-LIDS report, # LIDS-P-2457, July 1999.**

11. E. Frazzoli, M.A. Dahleh, E. Feron, "Robust Hybrid Control for Autonomous Vehicles Motion Planning," Technical report LIDS-P-2468, Laboratory for Information and Decision Systems, Massachusetts Institute of Technology, Cambridge, MA, December 1999.

12. Mao, Z.-H., Feron, E. and Bilimoria, K., "Stability of Intersecting Aircraft Flows under Decentralized Conflict Avoidance Rules", Technical Report LIDS-P-2469 , Laboratory for Information and Decision Systems, Massachusetts Institute of Technology, Cambridge, MA, January 2000.

13. Sommer Gentry paper, July SIAM conference

14. Lucia's paper, July 2001 SIAM conference

15. V. Gavrilets, B. Mettler, E. Feron, "Control Logic for Automated Maneuvering of Miniature Helicopter," MIT-LIDS report, # LIDS-P-2579, 2003.

16. V. Gavrilets, B. Mettler, E. Feron, "Dynamic Model for a miniature aerobatic Helicopter," MIT-LIDS report, # LIDS-P-2580, 2003.

17. V. Gavrilets, B. Mettler, E. Feron, "A note on using the linear quadratic regulator machinery to meet certain output dynamics requirements," MIT-LIDS report, # LIDS- P- 2572, 2003.

18. F. Joseph and E. Feron, "Computing the Optimal Mixed Strategy for Various Ambush Games", MIT-LIDS report #   , June 2005.

19. J. Le Ny and E. Feron, "Approximation Algorithms for the Dubins' Traveling Salesman Problem", MIT-LIDS report #2654, June 2005.

6. Invited Lectures

August 1995, "More reliable robustness indicators for linear systems subject to parametric uncertainties," California Institute of Technology, Pasadena, CA.

1996, "Robust and computational viewpoint on nonlinear systems," United Technologies Research Center, Hartford, CT.

February 1997, "Robust control systems and identification," Honeywell Research Center, Minneapolis, MN.

January-July 1997, "Time-Frequency Analysis for Transfer Function Identification and Application to F/A-18," presented at: UCLA , Hughes Communications, Catholic University of Leuven (Belgium)

January 1998, "Design and Analysis of Conflict Resolution Algorithms via Positive Semidefinite Programming," presented at: UC Berkeley, UCLA, UC Santa Barbara, Cal Tech.

March 1998, "Control of Linear Systems subject to Actuator Rate and Position Saturation," U. of Minnesota, Minneapolis, MN.

January - November 1999, "Identification and control of departure processes at busy airports", U. of Michigan, Catholic University of Leuven (Belgium), Eurocontrol Experimental Center (France), UCLA, UC Berkeley, Yale University, Boston University, ONERA (France), CNES (France), Stanford University.

May 1999, "Semidefinite Programming to Solve Conflicts Arising among many Aircraft", invited talk, workshop on Advances in Linear Matrix Inequalities in Systems and Control, Compiègne, France.

May 1999 "Aggressive Maneuvering of small autonomous Aerial Vehicles", invited talk, Catholic University of Leuven, Belgium.

August 1999, "Nonconvex quadratic programming", UC Berkeley.

March-November 2000, "Robust Hybrid Control for Autonomous Vehicles Motion Planning", United Technologies Research Center, Catholic University Leuven (Belgium), ESSI (Sophia-Antipolis, France), Stanford University, Princeton University.

March 2001 "Recent progress in Multi-Vehicle Coordination and Control", University of Illinois, Urbana-Champaign.

June 2001 "L'Aéroportuaire du Futur", Académie des Technologies, Séance plénière, Poitiers, France.

November 2001 "Acrobatic helicopter", Upenn, Philadelphia, PA.

June 2002: "Engineering education Challenges", National Academy of Air and Space, Ecole Nationale Supérieure de Techniques Avancées, Paris, France.

October 2002: "Real-time system requirements", real time and embedded systems, CNES, Toulouse, France.

October 2003: "Highly Agile helicopter control", Kyoto University, Hokkaido University, Japan. Host: Prof. Noboru Noguchi. Talk also delivered to Yamaha & Yanmar.

October 2003: "Collision avoidance issues in automotive applications" Talk delivered to Nissan and Subaru, Tokyo, Japan.

"Depression, a unique illness", MIT Leonardo dinner, November 2003.

November 2003 "Automated and acrobatic flight", Aircraft and Automation workshop, Marc Pélegrin host, Office National d'Etudes et Recherches Aérospatiales, Toulouse, France.

"Aerobatic autonomous helicopter flight", Stanford University, 08/04.

"Slowdown warning system for pile-up crash avoidance", MIT-ILP research conference, october 2004

"Bezout, French Mathematician in the XVIIIth century", MIT Leonardo dinner, Nov. 2004

Theses Supervised by Eric Feron

Summary	Total	Completed	In Progress
S.B.	9	9	0
S.M.	31	24	7
Engineer	0	0	0

Doctoral
    As Supervisor
    As Reader
	
	16
	18
		
		10
		14
			
			6
			4

S.B. Theses

†   A. Otero Saenz and D. Matsumoto, "Control of a Tethered Grapple," 1997. Award Winning team.

† D. McIvor, "Experimental Evaluation of an Artificial Vision System"," 1997.

P. Kuo, K. Peters and T. Wang, "Modeling an Airline Operations Center," UROP project, 1997-98.

K. Dyer, P. Eremenko and J. Markish, "Autonomous Helicopter Supervisory Control," UROP project, 1997-98.

M. Pirri, "Analysis and Design of an Airport Simulation Tool," UROP project, 1998.

˒ P. Elliott and Benjamin Ingram, "Automatic Control of an Autonomous Helicopter", 1999.

†   A. Matusevski and A. Shterenberg, "Analysis and design of mechanical and electronic data processing systm for autonomous vehicle system inertial management unit.", 1999.

T. Borrego and J. Wright, "Helicopter aggressive maneuvering: Human performance", 1999.

T. Melconian, "Open-loop vibrational magnetic control of small devices", 1999.

Christophe Martin 1995, ecole Polytechnique SB thesis

M. Coudyser 2001

Timothee de Mierry "Ground Vibration test of Hind Helicopter", 2002

Adrian Townsend and John Sims, "Air-Levitated Sytems," 2004.

S.M. Theses

C. Sabol, "Application of Sun-Synchronous, Critically Inclined Orbits of Global Personal Communications Systems," February 1994.

F. Niles, "Noise Covariance Change Detection Using Kalman Filtering", May 1996.

L. Lintereur, "Optimal Trajectory Determination for Strapdown IMU Calibration", May 1996.

X. Paternot, "F18-SRA analysis via Wavelets and Identification", May 1996 (ETH Zurich).

L. Duchesne, "A Novel Algorithm for Flutter Boundary Determination", January 1997.

M. Shewchun, "Linear Matrix Inequalities for Control Problems with Pointwise-in-Time Constraints", August 1997.

A. Turevskiy, "Flutter Boundary Prediction Using Experimental Data", January 1998.

C. Sanders, "Real-Time Collision Avoidance for Autonomous Air Vehicles", January 1998.

G. Desilles, "Differential Kolmogorov Equations for Transiting Processes", May 1998.

B. Lintereur, "Control System Design Using Convex Constraint Specification and Youla Controller Parameterization", May 1998.

B. Delcaire, "Dealing with Airport Congestion: Development of Tactical Tools for the Departure Flows from a Large Airport", May 1998.

A. Budge, "Aerodynamic Fuze Characteristics for Trajectory Control", May 1998.

S. George, "The Effect of Configurational Asymmetries on Projectile Aerodynamics, Stability, and Guidance", May 1998.

M. Jamoom, "Constrained Optimization for Hierarchical Control System Design", May 1999.

H.-F. Vuong, "Modeling and Analysis of Software Specifications for an Autonomous Aerial Vehicle", May 1999.

K. Andersson, "Potential Benefits of Information Sharing During the Arrival Process at Hub Airports", May 2000.

A. Shterenberg, "Instrumentation and System Identification for a Small Autonomous Helicopter", September 2000.

Z.-H. Mao, "Stability and Performance of Intersecting Aircraft Flows under Decentralized Conflict Resolution", May 2000.

F. Carr, "Stochastic Modeling and Control of Surface Traffic", February 2001.

T. Schouwenaars, "Path planning of several vehicles using mixed-integer programming" 2001, KU Leuven

D. Dugail, "En-route airspace capacity under flow
separation and scheduling constraints"

K. Sprague, Avionics System for highly agile autonomous Systems 2002

I. Martinos, "Path Planning for highly agile autonomous systems 2003

Ji Hyun Yang, "Development of a Performance-Based Approach for Collision Avoidance and Mitigation, May 2003

M. Ishutkina, Design and analysis of safe laboratory flight systems, completed 06/04

Rodin Lyasoff, Completed 08/04

Emily Craparo, Completed 06/04

Farmey Joseph: Randomized path planning for personnel and vehicle security management, 06/05

Greg Marks: Flexibility in Unmanned Rotorcraft design, 06/05

Olivier Toupet: Path planning of Unmanned Rotorcraft using Linear and Integer Programming, 01/06

K. Sprague (MIT TPP) Completed 08/04

Phillip Root, Randomized path planning for invasion route reconaissance by unmanned aerial helicopters, 06/05.

Glenn Tournier, under way

Engineer's Theses

None

Doctoral Theses, Supervisor

M. W. McConley, "A computationally Efficient Lyapunov-Based Procedure for Control of Nonlinear Systems with Stability and Performance Guarantees". 1997.

N. Pujet, "Modeling and Control Airport of Departure Processes at Busy Airports". September 1999.

E. Frazzoli, "Aggressive maneuvering for unmanned aerial vehicles". Completed aug 2001.

L. McGovern, "Computational Analysis of Real-Time Convex Optimization for Control Systems". May 2000.

Vladislav Gavrilets, "Acrobatic aerial robotics". Completed 08/2003

S. Gentry, "A mathematical approach to swing dancing". 06/05.

J. DeMot, "Collaborative multi-agent planning", 06/05.

F. Carr, "Robust Decision-Support Tools for Airport Surface Traffic", Completed Jan 2004

Z. H. Mao, Modeling of basal ganglia/cortex interactions, 06/05

T. Schouwenaars, Safe trajectory planning for multiple unmanned vehicles

Mardavij Roozbehani, under way

Animesh Chakravarthy, under way

J H Yang, under way.

Chris Dever, "Path planning of unmanned helicopter using parameterized aggressive maneuvers and Integer Programming" August 2004

Jerome Le Ny

Selcuk Bayraktar

René Valenzuela

Doctoral Theses, Reader

K. Y. Yang, "Efficient Design of Robust Controllers for H2 Performance", 1997.

P. Miotto, "Fixed Structure methods for Flight Control Analysis and Automated Gain Scheduling", 1997.

J. F. Bosc, "Techniques d'évitement réactif et simulation du trafic aérien", 1998 (Institut National Polytechnique de Toulouse, France).

K. Gandhi, "Nonlinear Modeling and Characterization Techniques for Phase Transitions in Electro-Mechanically Coupled Devices", 1998.

J. Yung, "Control of multiple spacecraft". Under way.

R. Kornfeld, "The Impact of GPS Velocity Vector Based Flight Controls on Flight Instrumentation Architecture", 1999.

W. Hall, "Efficient Capacity Allocation in a Collaborative Air Transportation System", 1999.

William Kaliardos, "Semistructured Decision Processes", 1999.

Gregory Mallory, "Development and Experimental Validation of Direct Controller Tuning for Spaceborne Telescopes", April 2000.

Jorge M. Gonçalves, "Stability Analysis of Hybrid Systems", September 2000.

Jerry Wohletz, "Retrofit Systems for Reconfiguration in Civil Aviation", January 2000.

Olivier DeWeck, "Spacecraft control".

Kuan Hang Chen, "Data-rich correlations".

Shen-Fang Liao, "Robust Control of Surge and Rotating Stall in an Axial Compressor", September 2000.

David Benson, done.

Sri Sarma, under way.

Alvar Otero-Saenz, under way.

Arthur Richards, done.