

Amor A. Menezes

Curriculum Vitæ

University of California, Berkeley
2151 Berkeley Way, Berkeley, CA 94704-5230

✉ amenezes@berkeley.edu

🌐 <http://genomics.lbl.gov/~amenezes>

ACADEMIC EXPERIENCE

2016 **University of California, Berkeley**, *California Institute for Quantitative Biosciences*
Associate Project Scientist

EDUCATION

Postdoc. **University of California, Berkeley**, *California Institute for Quantitative Biosciences*
2016 – 2011 Advisor: Adam P. Arkin; Fields: Synthetic Biology and Biological Control Systems

University of California, San Francisco, *Department of Surgery*
Co-Advisor: Mitchell J. Cohen; Fields: Systems Biology and Acute Traumatic Coagulopathy

Postdoc. **University of Michigan**, *Department of Aerospace Engineering*
2011 – 2010 Advisor: Ilya V. Kolmanovsky; Fields: System Modeling and System Identification

Ph.D. **University of Michigan**, *Department of Aerospace Engineering*
2010 – 2007 Advisor: Pierre T. Kabamba; Fields: Stochastic Optimization and Evolutionary Computation

M.S.E. **University of Michigan**, *Department of Aerospace Engineering*
2006 – 2005 Advisor: Pierre T. Kabamba; Specialization: Flight Dynamics and Controls

B.A.Sc. **University of Waterloo**, *Department of Mechanical Engineering*
2005 – 2000 Advisor: Jan P. Huissoon; Options: Mechatronics and Management Sciences

Glider Flt. **Central Region Gliding School**, *Transport Canada Glider Pilot's License and Glider Instructor Rating*
2005, 1999 Glider licensed since 1999, instructor-rated during 2011–2005

Power Flt. **National Flyers Academy**, *Transport Canada Private Pilot's License and Night Rating*
2000 Single engine licensed and night-rated since 2000

RESEARCH INTERESTS IN DYNAMICAL SYSTEMS THEORY AND CONTROL

Systems	Personalized clinical treatment of severely injured patients with trauma-induced coagulation deficits
Biology	Dynamical systems approaches to remedies for hypocoagulation and hypercoagulation disorders Biological optimization in dynamic environments and its translation to non-biological applications
Synthetic	Generalized <i>de novo</i> biological signal processing modules to accomplish control and optimization
Biology	Space applications of (synthetic) biology to reduce mission costs without compromising safety or success Biosecurity applications of biological control modules to intercept and inactivate rogue biological processes

RESEARCH FUNDING SECURED

Primary-Author Proposals Funded or Submitted

Submitted **\$125,000, Co-I (Science PI)**, *A Synthetic Biology Architecture to Detoxify and Enrich Mars Soil for Agriculture*
NASA Innovative Advanced Concepts, NASA Space Technology Mission Directorate

Submitted **\$15,000,000, Co-I (Science PI)**, *Center for the Utilization of Biological Engineering in Space (CUBES)*
Space Technology Research Institute, NASA Space Technology Mission Directorate

2020 – 2016 **\$2,407,667, Controls Co-I**, *Programmed Cellular Self-Optimization to Tailor Antibiotic Delivery*
Biological Technologies Office, Defense Advanced Research Projects Agency

2016 – 2015 **One FTE**, *Design and Validation of Synthetic Genetic Analog Control and Optimization Modules*
Synthetic Biology Engineering Research Center, National Science Foundation

- 2015 – 2014 **One FTE**, *Design and Validation of a Synthetic Genetic Reference Tracking Controller*
Synthetic Biology Engineering Research Center, National Science Foundation
- 2013 **\$40,000**, *Analysis of Synthetic Biology Techniques for Resource Utilization and Food Production in Space*
University Affiliated Research Center, NASA Ames and the University of California, Santa Cruz
- 2012 – 2011 **One FTE**, *Diesel Engine Air Path Modeling for Coordinated Control: Research Project Year 2*
Toyota Technical Center, Toyota Motor Company
- 2013 – 2009 **\$299,998**, *GOALI: Control of Cyclic Systems: Theory, Applications, and Experiments*
Civil, Mechanical and Manufacturing Innovation Division, National Science Foundation

Co-Author Proposals Funded or Submitted

- Submitted **\$20,000, Co-I**, *Towards a Synthetic Biology Blueprint for Countering Biological Threats to the United States*
Synthetic Biology Leadership Excellence Accelerator Program, Catalyst Grant Opportunity

RESEARCH SUPERVISION

- 2016 Christopher J. Mathy, *Genetic Control Systems*
Graduate student, Department of Bioengineering, University of California, Berkeley
- 2016 – 2015 Aaron J. Berliner, *Development and Use of a Martian Environment Chamber for Space Synthetic Biology*
Graduate student, Department of Bioengineering, University of California, Berkeley
- 2016 – 2015 Daniel A. Anderson, *Genetic Control Systems*
Undergraduate student, Molecular and Cell Biology, University of California, Berkeley
Now: Graduate student, Massachusetts Institute of Technology
- 2015 Joao A. Ascensao, *Design of a Synthetic Biological Analog Optimization Module*
Undergraduate student, Rice University; Amgen Scholar, University of California, Berkeley
Now: Fulbright scholar, Universitat Pompeu Fabra
- 2011 Dhaval D. Shah, *Glider Flight Environment Modeling*
Graduate student, Department of Aerospace Engineering, University of Michigan
Now: On-board diagnostic controls engineer, Fiat Chrysler Automobiles North America LLC

HONORS, AWARDS AND SCHOLARSHIPS

- 2015 **Emerging Leader in Biosecurity**, *University of Pittsburgh Medical Center's Center for Health Security*
- 2015 **Fellow**, *Synthetic Biology Leadership Excellence Accelerator Program*
- 2014 Conference Travel Award, *Synthetic Biology Engineering Research Center Student and Postdoc Association*
- 2011 **Policy Leader (top 50/1200)**, *Public Service of Canada*
- 2010 Conference Travel Award, *American Control Conference*
- 2010, 2007 Best Presentation in Session, *American Control Conference*
- 2010 – 2008 **Natural Sciences and Engineering Research Council of Canada Post-Graduate Scholarship**
- 2009 Michigan Teaching Fellow (an awarded title), *University of Michigan*
- 2008 Best Presentation in Session, *Dynamic Systems and Control Conference*
- 2008 – 2006 International Conference Travel Awards, Rackham Graduate School, *University of Michigan*
- 2007 – 2004 Canadian Space Agency Sponsored Student Delegate, *International Astronautical Congress*
- 2005 – 2006 **Milo E. Oliphant Fellowship**, *University of Michigan*
- 2005 **Dean's Honors List (top 10%); Distinction; Sandford Fleming Co-op Medal**, *Univ. of Waterloo*
- 2005 Ontario Engineering Competition, Team A, *University of Waterloo*
- 2004 First Place, Mini-Sumo Robot Competition, *University of Waterloo*

- 2004 – 2000 **Arthur F. Church Mechanical Engineering Academic Scholarship; Toronto Transportation Club Scholarship; Queen Elizabeth II Aiming for the Top Scholarship**
- 2003 **Husky Injection Molding Systems Co-op and Academic Scholarship, *University of Waterloo***
- 2003 – 2001 Sir Sandford Fleming Outstanding Co-op Work Term Report Awards, *University of Waterloo*
- 2002 Sir Sandford Fleming Technical Speaking Faculty of Engineering Champion, *University of Waterloo*
- 2000 **Governor General’s Medal; Ed King Outstanding Graduate of the Year; Grace McFarlane Christian Outreach Award; University of Toronto National Book Award**
- 1997 **Ontario Champion, *Spelling Bee of Canada***
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TEACHING AND MENTORING

- 2011 Co-Primary Instructor, *Nonlinear Systems and Control*
Graduate course, 40 students for one winter semester, University of Michigan
- 2010 Graduate Teacher Certificate, *Center for Research on Learning and Teaching*
Primary instructor certified, University of Michigan
- 2010 – 2007 Graduate Student Instructor (GSI) Mentor, *Center for Research on Learning and Teaching*
Consultant for 30 College of Engineering GSIs every semester for six semesters, University of Michigan
- 2009 – 2006 Graduate Student Instructor, *Performance of Aircraft and Spacecraft*
Undergraduate course, 150/35 students every fall/winter semester for six semesters, University of Michigan
Average evaluation (out of 5.0): personal 4.2, previous course instructors 3.8, college-wide instructors 4.0
- 2009, 2007, Mentor, *Michigan Mentorship Program*
- 2006 High school gifted program, one student every summer, Washtenaw County Alliance for Gifted Education
- 2005 Glider Flight Instructor, *Royal Canadian Air Cadets Glider Scholarship Program*
Six-week glider pilot license course, three 16-year-olds for one summer, Central Region Gliding School
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SERVICE AND LEADERSHIP

- 2016 White House Office of Science and Technology Policy, *Homesteading in Space*
Technical Expert Discussion Leader, Space Bioengineering
- 2016 – 2015 National Institute of Standards and Technology, *Synthetic Biology Standards Consortium*
Steering Committee Member and Working Group Co-lead, Performance Metrics for Engineered Organisms
- 2012, 2011 American Control Conference, *Flight Control II* and *Biologically-Inspired Methods and Applications*
Session Co-chair
- 2011 University of Michigan College of Engineering, *Outstanding Student Instruction Award Selection Committee*
Member
- 2011 Robotica, *Special Issue on “Robotic Self-X Systems”*
Guest Editor
- 2010 – 2009 University of Michigan Department of Aerospace Engineering, *Graduate Student Advisory Council*
Executive Member
- 2009 – 2008 University of Michigan Department of Aerospace Engineering, *Flight Dynamics and Control Seminar Series*
Organizer
- 2009, 2008 University of Michigan Department of Aerospace Engineering, *Graduate Student Instructor Orientation*
Organizer
- 2008 Dynamic Systems and Control Conference, *Self-Reconfigurable and Self-Reproducing Dynamic Systems*
Invited Session Organizer
- 2005, 2003 University of Waterloo, *St. Paul’s United College*
Residence Don and Frosh Leader
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INVITED WORKSHOPS

- 2016 Twentieth Century Fox “The Martian,” *Forum on the Journey to Mars 101*; and White House Office of Science and Technology Policy, *Homesteading in Space*
- 2016 National Intelligence Council Strategic Futures Group, *Global Trends Report UC Berkeley Workshop*
- 2015 National Aeronautics and Space Administration Office of the Chief Technologist, *BioSpace Big Think*
- 2015 Defense Advanced Research Project Agency Biological Technologies Office, *Workshop on Biocomplexity*
- 2014 National Aeronautics and Space Administration Ames Research Center, *Weekend Workshop on CO₂-Based Manufacturing*

PROFESSIONAL EXPERIENCE

- 2010 – 2001 Royal Canadian Air Force Cadet Instructor Cadre, *Central Ontario Gliding Centre Glider Flight Familiarization Pilot and Instructor*
- 2004 ATS Automation Tooling Systems, Inc., *Systems Designer*
- 2003 Messier-Dowty, Inc., *Stress Engineering Analyst*
- 2003, 2002 Husky Injection Molding Systems, Ltd., *Mechanical Engineering Designer*
- 2001 MacDonald Dettwiler Space and Advanced Robotics, Ltd., *National Aeronautics and Space Administration Shuttle Remote Manipulator System (Canadarm) Product Assurance*

REVIEWER (ALPHABETICAL)

- Journal Artificial Life, Computational and Mathematical Methods in Medicine, IEEE/ASME Transactions on Mechatronics, IEEE Robotics and Automation Magazine, Journal of Mathematical Biology, Mathematical Problems in Engineering, PLoS Computational Biology, PLoS One, Robotica
- Conference American Control Conference, ASME Dynamic Systems and Control Conference, IEEE Conference on Decision and Control, IFAC World Congress

REFEREED PUBLICATIONS

Journal Papers Published, In Press or Submitted

‡ denotes an alphabetical author listing

12. **Amor A. Menezes** and Pierre T. Kabamba. Bioinspired resilient grammatical inference for robot learning in dynamic environments. Submitted to *Artificial Life*.
11. **Amor A. Menezes**, Dhaval D. Shah, and Ilya V. Kolmanovsky. An evaluation of stochastic model-dependent and model-independent glider flight management. Submitted to the *IEEE Transactions on Control Systems Technology*.
10. **Amor A. Menezes**, Ryan F. Vilardi, Adam P. Arkin, and Mitchell J. Cohen. Targeted clinical control of trauma patient coagulation through a thrombin dynamics model. *Science Translational Medicine*, 9(371), January 4, 2017.
9. **Amor A. Menezes** and Pierre T. Kabamba. Efficient and resilient micro air vehicle flapping wing gait evolution for hover and trajectory control. *Engineering Applications of Artificial Intelligence*, 54:1–16, September 2016.
8. **Amor A. Menezes** and Pierre T. Kabamba. Efficient search and responsiveness trade-offs in a Markov chain model of evolution in dynamic environments. *Mathematical Biosciences*, 276:44–58, June 2016.
7. **Amor A. Menezes**, Michael G. Montague, John Cumbers, John A. Hogan, and Adam P. Arkin. Grand challenges in space synthetic biology. *Journal of the Royal Society Interface*, 12(113):20150803, December 6, 2015. **Headline review article in synthetic biology.**
6. **Amor A. Menezes**, John Cumbers, John A. Hogan, and Adam P. Arkin. Towards synthetic biological approaches to resource utilization on space missions. *Journal of the Royal Society Interface*, 12(102):20140715, January 6, 2015. **Cover article.**

5. **Amor A. Menezes** and Pierre T. Kabamba. Optimal search efficiency of Barker's algorithm with an exponential fitness function. *Optimization Letters*, 8(2):691–703, February 2014.
4. Chris Vermillion, **Amor Menezes**, and Ilya Kolmanovsky. Stable hierarchical model predictive control using an inner loop reference model and λ -contractive terminal sets. *Automatica*, 50(1):92–99, January 2014.
3. †Yongsoo Eun, Eric M. Gross, Pierre T. Kabamba, Semyon M. Meerkov, **Amor A. Menezes**, and Hamid R. Ossareh. Cyclic control: Problem formulation and stability analysis. *ASME Journal of Dynamic Systems, Measurement, and Control*, 135(5):051012-1–051012-9, September 2013.
2. †Yongsoo Eun, Eric M. Gross, Pierre T. Kabamba, Semyon M. Meerkov, **Amor A. Menezes**, and Hamid R. Ossareh. Cyclic control: Reference tracking and disturbance rejection. *IEEE Transactions on Control Systems Technology*, 21(3):753–764, May 2013.
1. **Amor A. Menezes** and Pierre T. Kabamba. Optimal seeding of self-reproducing systems. *Artificial Life*, 18(1):27–51, 2012.

Conference Papers Published, In Press or Submitted

† denotes an alphabetical author listing

15. **Amor A. Menezes** and Ilya V. Kolmanovsky. Energy and power management in a series hybrid electric vehicle using selective evolutionary generation. In *Proceedings of the 53rd IEEE Conference on Decision and Control*, pages 3310–3315, December 15–17, 2014.
14. Dhaval D. Shah, **Amor A. Menezes**, and Ilya V. Kolmanovsky. Glider flight environment modeling for optimal control. In *Proceedings of the 2012 American Control Conference*, pages 926–931, June 27–29, 2012.
13. †Yongsoo Eun, Eric Gross, Pierre Kabamba, Semyon Meerkov, **Amor Menezes**, and Hamid Ossareh. Cyclic control: The case of static output feedback. In *Proceedings of the 18th IFAC World Congress*, pages 9181–9187, August 28–September 2, 2011.
12. **Amor A. Menezes** and Pierre T. Kabamba. Efficient and responsive stochastic optimization. In *Proceedings of the 18th IFAC World Congress*, pages 4735–4740, August 28–September 2, 2011.
11. Chris Vermillion, **Amor Menezes**, and Ilya Kolmanovsky. Stable hierarchical model predictive control using an inner loop reference model. In *Proceedings of the 18th IFAC World Congress*, pages 9278–9283, August 28–September 2, 2011.
10. Ilya V. Kolmanovsky and **Amor A. Menezes**. A stochastic drift counteraction optimal control approach to glider flight management. In *Proceedings of the 2011 American Control Conference*, pages 1009–1014, June 29–July 1, 2011.
9. **Amor A. Menezes** and Pierre T. Kabamba. Selective evolutionary generation: A model for optimally efficient search in biology. In *Proceedings of the 2011 American Control Conference*, pages 4117–4122, June 29–July 1, 2011.
8. **Amor A. Menezes** and Pierre T. Kabamba. Rational behavior design using multi-selective generation. In *Proceedings of the 49th IEEE Conference on Decision and Control*, pages 3938–3943, December 15–17, 2010.
7. †ShiNung Ching, Yongsoo Eun, Eric Gross, Eric Hamby, Pierre Kabamba, Semyon Meerkov, and **Amor Menezes**. Modeling and control of cyclic systems in xerography. In *Proceedings of the 2010 American Control Conference*, pages 4283–4288, June 30–July 2, 2010.
6. **Amor A. Menezes** and Pierre T. Kabamba. Resilient self-reproducing systems. In *Proceedings of the 2008 ASME Dynamic Systems and Control Conference*, number DSCC2008-2284, October 20–22, 2008.
5. **Amor A. Menezes** and Pierre T. Kabamba. Optimal seeding of a class of self-reproducing systems. In *Proceedings of the AIAA Guidance, Navigation and Control Conference and Exhibit*, number AIAA-2008-7272, August 18–21, 2008.

4. **Amor Menezes** and Pierre Kabamba. An optimal-seed identification algorithm for self-reproducing systems. In *Proceedings of the 58th International Astronautical Congress*, number IAC-07-D3.2.02, September 24–28, 2007.
3. **Amor Menezes** and Pierre Kabamba. A combined seed-identification and generation analysis algorithm for self-reproducing systems. In *Proceedings of the 2007 American Control Conference*, pages 2582–2587, July 11–13, 2007.
2. **Amor Menezes** and Pierre Kabamba. Information requirements for self-reproducing systems in lunar robotic colonies. In *Proceedings of the 57th International Astronautical Congress*, number IAC-06-A5.P.04, October 2–6, 2006.
1. **Amor Menezes**, Rowena Luk, Paul T. Y. Lam, and Ziad Bhunnoo. Applying Martian rover technology to solve terrestrial problems — the development of an Autonomous Cold-Trailing Omnirange Robot (ACTOR). In *Proceedings of the 56th International Astronautical Congress*, number IAC-05-E2.3.03, October 17–21, 2005.

Conference Abstracts Published, In Press or Submitted

5. Aaron J. Berliner, **Amor A. Menezes**, Eli Groban, Christopher P. McKay, and Adam P. Arkin. Open access characterization of extremophiles for potential application as pioneer organisms in Martian ecopoiesis. In *Proceedings of Extremophiles 2016, the 11th International Congress on Extremophiles*, September 12–16, 2016.
4. **Amor A. Menezes** and Pierre T. Kabamba. Efficient search and responsiveness trade-offs in a Markov chain model of evolution in dynamic environments. In *Proceedings of the 2015 Gordon Research Conference on Stochastic Physics in Biology*, January 11–16, 2015.
3. **Amor A. Menezes**, John Cumbers, John A. Hogan, and Adam P. Arkin. *In situ* resource utilization on manned Martian missions. In *Proceedings of the 2014 Synthetic Biology: Engineering, Evolution & Design Conference*, July 14–17, 2014. **Selected for oral presentation.**
2. **Amor A. Menezes**, Adam Arkin, and Mitchell Cohen. Modeling coagulation activation in trauma patients. In *Proceedings of the 11th International Conference on Complexity in Acute Illness, Journal of Critical Care*, volume 28, pages e10–e11, September 6–9, 2012. **Selected for oral presentation.**
1. **Amor A. Menezes**, Adam P. Arkin, and Mitchell J. Cohen. A minimal coagulation activation model for thrombin in trauma patients. In *Proceedings of the 13th International Conference on Systems Biology*, page 110, August 19–23, 2012.

Strategic Action Plans Published, In Press or Submitted

1. Sanjana J. Ravi and **Amor A. Menezes**. Towards a synthetic biology blueprint for countering biological threats to the United States. *Synthetic Biology Leadership Excellence Accelerator Program (LEAP)*, 2016.

NON-REFEREED PUBLICATIONS

Theses

1. **Amor A. Menezes**. *Selective Evolutionary Generation Systems: Theory and Applications*. PhD Thesis, University of Michigan, 2010.

Journal Editorials

1. **Amor A. Menezes** and Pierre T. Kabamba. Realizing the promise of robotic self-x systems. *Robotica*, 29(1):i–ii, January 2011.

Book Chapters

1. **Amor A. Menezes** and Pierre T. Kabamba. Markov chain rational behavior. In Jingshan Li and Pierre T. Kabamba, editors, *Advances in Systems Theory: Control, Communication Networks, Production Systems and Rational Behavior*. Wing Span Press, 2009.

Technical Reports

3. Chris Vermillion, **Amor Menezes**, and Ilya Kolmanovsky. Stable hierarchical model predictive control using an inner loop reference model and λ -contractive terminal constraint sets — supplementary material. Technical Report CGR-13-01, University of Michigan, Ann Arbor, 2013. arXiv:1305.2651 [math.OC].
2. **Amor Menezes** and Pierre Kabamba. Resilient opportunistic on-line global optimization. Technical Report CGR-09-11, University of Michigan, Ann Arbor, 2009.
1. **Amor Menezes** and Pierre Kabamba. On the seeding of self-reproducing systems. Technical Report CGR-07-08, University of Michigan, Ann Arbor, 2007.

PRESS INTERVIEWS

Radio

1. Space synbio; space biomanufacturing; astronaut food; and space pharmaceuticals. *Science Today (CBS Radio)*, November 12, 2014.

Print (Newspapers, Magazines and Web)

11. How GMOs will let astronauts live on Mars. *Discover Magazine*, December 18, 2015.
10. Why hacking DNA is the secret of deep-space travel. *Popular Mechanics*, December 11, 2015.
9. The many frontiers of synthetic biology. *Berkeley Engineer*, May 1, 2015.
8. To the stars and back again. *Berkeley Science Review*, April 29, 2015.
7. Taking our (bacterial) cultures into space. *Berkeley Science Review*, April 28, 2015.
6. Packing light for Mars. *Cosmos*, March 16, 2015.
5. Mars missions and space synthetic biology. *BioTechniques*, December 5, 2014.
4. Why synthetic biology could be the key to space travel. *Popular Mechanics*, November 7, 2014.
3. Mit Bioreaktoren und 3D-Druckern zum Mars. *Der Spiegel*, November 5, 2014.
2. Biological waste to transform long-duration space travel and colonisation of Mars. *International Business Times*, November 5, 2014.
1. Q & A: Synthetic biology and space. *Royal Society Publishing Blog*, November 5, 2014.

INVITED TALKS (EXCLUDING CONFERENCE PAPER PRESENTATIONS)

Plenaries

1. *Outer Space: The Next Biotech Frontier*. World Congress on Industrial Biotechnology, Biotechnology Innovation Organization, San Diego CA, April 18, 2016.

Seminars

19. *Engineering Robotic Biological Systems*. Intelligent Systems Division, NASA Ames Research Center, Mountain View CA, April 5, 2016.
18. *Engineering Robotic Biological Systems*. Department of Weapons and Systems Engineering, United States Naval Academy, Annapolis MD, March 3, 2016.

17. *Targeted Clinical Control of Trauma Patient Coagulation Through a Thrombin Dynamics Model*. Hot Topics Session, The Path to Predictive Medicine with Computing, Biological Applications of Advanced Strategic Computing Meeting, Monterey CA, September 22, 2015.
 16. *LEAP Fellow Report*. Synthetic Biology Engineering Research Center Fall Meeting, Massachusetts Institute of Technology, Cambridge MA, September 20, 2015.
 15. *Engineering Robotic Biological Systems*. Department of Mechanical Engineering, Iowa State University, Ames IA, February 19, 2015.
 14. *Targeted Clinical Control of Trauma Patient Coagulation Through a Thrombin Dynamics Model*. Postdoc Seminar Series. California Institute for Quantitative Biosciences, University of California, Berkeley CA, February 13, 2015.
 13. *Towards Synthetic Biological Approaches to Resource Utilization on Space Missions*. Synthetic Biology Supergroup, California Institute for Quantitative Biosciences – Berkeley; Synthetic Biology Engineering Research Center; and the Synthetic Biology Institute, University of California, Berkeley CA, January 21, 2015.
 12. *The Utility of Biological CO₂-Based Manufacturing on Manned Space Missions*. Weekend Workshop on CO₂-Based Manufacturing, NASA Ames Research Center, Mountain View CA, June 28, 2014.
 11. *A Thrombin Dynamics Model of Trauma Patient Coagulation for Targeted Clinical Control*. Center for Systems & Synthetic Biology, University of California, San Francisco CA, May 24, 2013.
 10. *Efficient, Model-Independent and Responsive Stochastic Optimization for Robot Learning*. Mobility and Robotic Systems Section, NASA Jet Propulsion Laboratory, Pasadena CA, July 25, 2012.
 9. *Causal Inference in Modeling Coagulation Activation in Trauma*. Causal Consulting Seminar Series. Division of Biostatistics, School of Public Health, University of California, Berkeley CA, April 24, 2012.
 8. *Efficient and Responsive Stochastic Optimization*. Control Systems, United Technologies Research Center, East Hartford CT, August 9, 2011.
 7. *Efficient and Responsive Stochastic Optimization for Machine Learning*. Machine Learning / Control Systems, Philips Research North America, Briarcliff Manor NY, August 2, 2011.
 6. *Efficient and Responsive Biologically-Inspired Stochastic Optimization*. Department of Bioengineering, University of California, Berkeley CA, June 28, 2011.
 5. *Efficient and Responsive Systems for Stochastic Optimization*. Department of Electrical Engineering, University of Washington, Seattle WA, February 11, 2011.
 4. *Efficient and Responsive Behavior Design by Selective Evolutionary Generation*. Control Seminar Series. College of Engineering, University of Michigan, Ann Arbor MI, September 24, 2010.
 3. *Evolutionary Generation Systems Theory for Resilient Opportunistic Global On-line Optimization*. Flight Dynamics and Control Seminar Series. Department of Aerospace Engineering, University of Michigan, Ann Arbor MI, March 27, 2009.
 2. *Aerospace Exploration: The Final Frontier for the Next Generation*. Soaring Success for High Achievers. Washtenaw County Alliance for Gifted Education, Malletts Creek Library, Ann Arbor MI, March 27, 2007.
 1. *Information Requirements for Self-Reproducing Systems in Lunar Robotic Colonies*. Flight Dynamics and Control Seminar Series. Department of Aerospace Engineering, University of Michigan, Ann Arbor MI, November 3, 2006.
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REFERENCES (ALPHABETICAL)

Murat Arcak

Collaborator

Professor

Dept. of Electrical Eng. and Computer Sciences

University of California, Berkeley

569 Cory Hall, Berkeley, CA 94720-1770

(510) 642-4804

arcak@berkeley.edu

Mitchell J. Cohen

Postdoctoral Co-Advisor

Professor and Vice Chair

Department of Surgery

University of Colorado Anschutz Medical Campus

12631 E. 17th Avenue, C-305, Aurora, CO 80045

(303) 602-1057

Mitchell.Cohen@dhha.org

Ilya V. Kolmanovsky

Postdoctoral Advisor

Professor

Department of Aerospace Engineering

University of Michigan

1320 Beal Avenue, Ann Arbor, MI 48109-2140

(734) 615-9655

ilya@umich.edu

Adam P. Arkin

Postdoctoral Advisor

Dean A. Richard Newton Memorial Professor

Department of Bioengineering

University of California, Berkeley

2151 Berkeley Way, Berkeley, CA 94704-5230

(510) 495-2366

aparkin@lbl.gov

John A. Hogan

Collaborator

Environmental Scientist

Bioengineering Branch

NASA Ames Research Center

MS 239-15, Moffett Field, CA 94035

(650) 604-0152

John.A.Hogan@nasa.gov