John Maidens

Senior Data Scientist
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EDUCATION

Doctor of Philosophy in Electrical Engineering and Computer Sciences

August 2012 — August 2017

University of California, Berkeley   Berkeley, California

Master of Applied Science in Biomedical Engineering

September 2010 — July 2012

University of British Columbia   Vancouver, British Columbia

Bachelor of Science (Honors) in Mathematics

September 2006 — April 2010

University of Alberta   Edmonton, Alberta

PUBLICATIONS

Refereed Journal Articles and Book Chapters

1. J. Maidens, J. W. Gordon, H.-Y. Chen, I. Park, M. Van Criekinge, E. Milshteyn, R. Bok, R. Aggarwal, M. Ferrone, J. B. Slater, J. Kurhanewicz, D. B. Vigneron, M. Arcak, P. E. Z. Larson, "Spatio-temporally constrained reconstruction for hyperpolarized carbon-13 MRI using kinetic models," IEEE Transactions on Medical Imaging, 37 (12) 2603–2612, 2018.

2. P. E. Z. Larson, H.-Y. Chen, J. W. Gordon, N. Korn, J. Maidens, M. Arcak, M. Van Criekinge, L. Carvajal, D. Mammoli, R. Bok, R. Aggarwal, M. Ferrone, J. B. Slater, S. J. Nelson, J. Kurhanewicz, D. B. Vigneron, "Investigation of Analysis Methods for Hyperpolarized 13C-pyruvate Metabolic MRI in Prostate Cancer Patients," NMR in Biomedicine, pp. e3997, 2018.

3. J. Maidens, A. Barrau, S. Bonnabel, M. Arcak. "Symmetry reduction for dynamic programming." *Automatica* 97 367–375, 2018.

4. M. Arcak, J. Maidens, "Simulation-based reachability analysis for nonlinear systems using componentwise contraction properties," *Principles of Modeling*, eds. P. Derler, M. Lohstroh, M.Sirjani, pp. 61–76. Lecture Notes in Computer Science, Springer, 2018.

5. J. Maidens, M. Arcak, "Exploiting symmetry for discrete-time reachability computations," *IEEE Control Systems Letters*, 2 (2) 213–217, 2018.

6. J. Maidens, M. Arcak, "Control and Optimization Problems in Hyperpolarized Carbon-13 MRI," *Emerging Applications of Control and System Theory*, eds. R. Tempo, S. Yurkovich, and P. Misra, pp 29–40. Lecture Notes in Control and Information Sciences, Springer, Cham, 2018.

7. J. Maidens, J. W. Gordon, M. Arcak, P. E. Z. Larson, "Optimizing flip angles for metabolic rate estimation in hyperpolarized carbon-13 MRI," *IEEE Transactions on Medical Imaging* 35 (11) 2403–2412, 2016.

8. J. Maidens, M. Arcak. "Reachability analysis of nonlinear systems using matrix measures," *IEEE Transactions on Automatic Control* 60 (1) 265–270, 2015.

9. J. Maidens, S. Kaynama, I. M. Mitchell, M. Oishi, G. A. Dumont. "Lagrangian methods for approximating the viability kernel in high-dimensional systems," *Automatica* 49 (7) 2017–2029, 2013.

Refereed Conference Papers

1. F. Palma, T. Abdou, A. Bener, J. Maidens, S. Liu "An Improvement to Test Case Failure Prediction in the Context of Test Case Prioritization," *Proceedings of the 14th International Conference on Predictive Models and Data Analytics in Software Engineering*, Oulu, Finland, pp. 80–89, 2018.

2. J. Maidens, A. Barrau, S. Bonnabel, M. Arcak, "Symmetry reduction for dynamic programming and application to MRI," *American Control Conference*, Seattle, WA, pp. 4625–4630, 2017.

3. J. Maidens, A. Packard, M. Arcak, "Parallel dynamic programming for optimal experiment design in nonlinear systems," *IEEE Conference on Decision and Control*, Las Vegas, NV, pp. 2894–2899, 2016.

4. J. Maidens, M. Arcak, "Semidefinite relaxations in optimal experiment design with application to substrate injection for hyperpolarized MRI," *American Control Conference*, Boston, MA, pp. 2023–2028, 2016.

5. J. Maidens, P. E. Z. Larson, M. Arcak. "Optimal experiment design for physiological parameter estimation using hyperpolarized carbon-13 magnetic resonance imaging," *American Control Conference*, Chicago, IL, pp. 5770–5775, 2015.

6. J. Maidens, M. Arcak. "Trajectory-based reachability analysis of switched nonlinear systems using matrix measures," *IEEE Conference on Decision and Control*, Los Angeles, CA, pp. 6358–6364, 2014.

7. J. Maidens, M. Y. Li. "Global Lyapunov functions and a hierarchical control scheme for networks of robotic agents," *American Control Conference*, Washington, DC, pp. 4050–4055, 2013.

8. S. Kaynama, J. Maidens, M. Oishi, I. M. Mitchell, G. A. Dumont. "Computing the viability kernel using maximal reachable sets," *Hybrid Systems: Computation & Control*, Beijing, China, pp. 55–63, 2012.

Refereed Conference Abstracts

1. J. Maidens, N. B. Slamon, "Artificial Intelligence Detects Pediatric Heart Murmurs with Cardiologist-Level Accuracy". *American Heart Association Scientific Sessions*, p.12591, 2018.

2. P. E. Z. Larson, H.-Y. Chen, J. W. Gordon, J. Maidens, D. Mammoli, M. Van Criekinge, R. Bok, R. Aggarwal, M. Ferrone, J. B. Slater, J. Kurhanewicz, D. B. Vigneron, "Analysis Methods for Human Hyperpolarized 13C-pyruvate Studies". *Proceedings of the 26th Annual Meeting of the International Society for Magnetic Resonance in Medicine*, p.7274, 2018.

3. J. Maidens, J. W. Gordon, M. Arcak, P. E. Z. Larson, "Spatio-temporally constrained reconstruction for hyperpolarized carbon-13 MRI using kinetic models". *Proceedings of the 25th Annual Meeting of the International Society for Magnetic Resonance in Medicine*, p.3040, 2017.

4. J. Maidens, J. W. Gordon, M. Arcak, P. E. Z. Larson, "Optimizing flip angles for metabolic rate estimation in hyperpolarized carbon-13 MRI," *Proceedings of the 24th Annual Meeting of the International Society for Magnetic Resonance in Medicine*, p.2341, 2016.

5. P. Larson, J. Gordon, J. Maidens, M. Arcak, H.-Y. Chen, G. Reed, I. Park, R. Aggarwal, R. Bok, S. Nelson, J. Kurhanewicz, D. Vigneron. "Robust, Quantitative Methods Applied to Clinical Hyperpolarized C-13 MR of Prostate Cancer Patients," *Proceedings of the 24th Annual Meeting of the International Society for Magnetic Resonance in Medicine*, p.2347, 2016.

Patents

1. C. Landgraf, P. Goolkasian, J. Maidens, T. Crouch, J. Bellet, S. L. Pham. "Methods and systems for determining a physiological or biological state or condition of a subject," United States Provisional Patent, Filed August 21, 2018.

Theses

1. J. Maidens. "Optimal Control for Learning with Applications in Dynamic MRI," Doctor of Philosophy Dissertation, University of California, Berkeley, August 2017.

2. J. Maidens. "Scalable computation of viability kernels and a viability-theoretic approach to guaranteeing safety for closed-loop medical devices," Master of Applied Science Thesis, University of British Columbia, July 2012.

2018 **National Institutes of Health R43 Grant**

Small business innovation research (SBIR) grant from the United States National Institutes of Health
PI/PD: Maidens, John (Eko Devices, Inc.)   co-PI: Chorba, John (UCSF School of Medicine)

Proposal title: Deep learning for automated valvular heart disease screening using a digital stethoscope
Award Amount: $295,881 (USD)

SOSCIP Advanced Computing Platform Access Grant

Provides an allocation of high-performance computing platform time
PI/PD: Maidens, John (Ryerson University)   co-PI: Bener, Ayse (Ryerson University), Bogdani, Gary (Unilever Canada)

Proposal title: Active learning for automatic generation of narratives from numeric financial and supply chain data
Award Amount: 210,240 CPU core hours, 2 TB data storage, 1,440 GPU node hours

SOSCIP Accelerator HQP Grant

Provides cash support for the training of highly-qualified personnel
PI/PD: Maidens, John (Ryerson University)   co-PI: Bener, Ayse (Ryerson University), Bogdani, Gary (Unilever Canada)

Proposal title: Active learning for automatic generation of narratives from numeric financial and supply chain data
Award Amount: $20,000 (CAD)

2017 **NSERC Postdoctoral Fellowship (Declined)**

Canadian federal funding to support postdoctoral research in the natural sciences or engineering

Proposal title: Optimization algorithms for constrained reconstruction in dynamic MRI
Award Amount: $90,000 (CAD)

2012 **NSERC Postgraduate Scholarship — Doctoral Level (3 years)**

Canadian federal funding to support high calibre scholars engaged in doctoral programs in the natural sciences or engineering, tenable at institutions outside of Canada

Proposal title: Geometric methods for reachability analysis and formal safety verification in complex, high-dimensional systems
Award Amount: $63,000 (CAD)

2011 **Faculty of Applied Science Graduate Award**

Recruitment award offered as a top-up to NSERC CGS holders registered in the Faculty of Applied Science at UBC

B.C. Medtech Graduate Award in Biomedical Engineering

Awarded to students in the first year of graduate studies in Biomedical Engineering who demonstrate an entrepreneurial spirit, leadership and communication skills

2010 **NSERC Canada Graduate Scholarship — Master's Level**

Canadian federal funding to support high calibre scholars engaged in master's programs in the natural sciences or engineering

Proposal title: Equilibria and global stability for networked dynamical systems with applications in epidemiology, ecology and control theory

Institute for Computing Information and Cognitive Systems Scholarship

Graduate scholarship for exceptional students studying ECE, CS or ME at the University of British Columbia

Employment

Senior Data Scientist

February 2017 — Present
Eko Devices, Inc.
Berkeley, California

Assistant Professor

July 2018 — December 2018
Ryerson University
Toronto, Ontario

Graduate Student Research Appointment*

August 2012 — May 2017
University of California, Berkeley
Advisor: Murat Arcak
* Partial appointment from 2012—2015 due to external fellowship

Research Assistant

September 2012 — July 2012
University of British Columbia
Advisor: Guy Dumont

Teaching Experience

Instructor

September 2018 — December 2018
Ryerson University
DS 8003: Management of Data and Big Data Tools

Graduate Student Instructor

September 2016 — December 2016

University of California, Berkeley

EE 16B: Designing Information Devices and Systems II

Professors: Michel Maharbiz and Murat Arcak

Graduate Student Instructor

January 2016 — May 2016

University of California, Berkeley

EE 222: Nonlinear Systems: Analysis, Stability and Control

Professor: Murat Arcak

Graduate Student Instructor

August 2015 — December 2015

University of California, Berkeley

EE 120: Signals and Systems

Professor: Murat Arcak

Teaching Assistant

January 2012 — April 2012

University of British Columbia

CICS 510: Theoretical Foundations of Computer Science

Professor: Thanos Stouraitis

Teaching Assistant

September 2011 — December 2011 & January 2012 — April 2012

University of British Columbia

EECE 320: Discrete Structures and Algorithms

Professor: Sathish Gopalakrishnan

Exam Solution Writer

University of British Columbia Math Club

MATH 257/316: Partial Differential Equations (November 2010, March 2011)

MATH 215/255: Ordinary Differential Equations (March 2011)

On-line Course Developer

May — August 2007

University of Alberta

Supervisor: George Peschke

Project: Help design a system to provide online mathematics courses

Service

Reviewer for

Annual Reviews in Control, 2017

American Control Conference, 2015, 2016, 2017, 2018

Automatica, 2013, 2014, 2017

Automatika — Journal for Control, Measurement, Electronics, Computing and Communications, 2016

IEEE Conference on Decision and Control, 2015, 2016

IEEE Life Sciences Letters, 2015

Knowledge-Based Systems, 2016

Applied Mathematical Modeling, 2018

European Control Conference, 2019

UC Berkeley EECS graduate admissions committee

Student Member, 2014, 2015

UC Berkeley Control Theory Seminar Series

Co-organizer, 2015 — 2016

Biomedical Engineering Graduate Association — University of British Columbia

Interim Secretary, January 2011 — October 2011

Undergraduate Mathematical Sciences Society — University of Alberta

Social Convenor, 2006 — 2007

President, 2007 — 2008

Vice President, 2008 — 2009

Professional Associations

Society for Industrial and Applied Mathematics (SIAM)

Institute of Electrical and Electronics Engineers (IEEE)

International Society for Magnetic Resonance in Medicine (ISMRM)

American Heart Association (AHA)

Languages

English (native)

French (fluent)