

Personal information

Born March 14, 1987, in St.Gallen, Switzerland

Swiss citizen from Appenzell and St.Gallen

Languages: German, English, French

Education

- 2012-2017 Doctor of Sciences (**Ph.D. in Electrical Engineering**), Department of Electrical Engineering and Information Technology, ETH Zurich, Switzerland
Thesis: *Convex programming in optimal control and information theory* (supervisor: John Lygeros)
- 2010-2012 **M.Sc. in Robotics Systems and Control**¹(GPA: 5.74/6.0), ETH Zurich, Switzerland
- 2007-2010 **B.Sc. in Mechanical Engineering** (GPA: 5.31/6.0), ETH Zurich, Switzerland
- 2002-2006 **Matura**, Majors: Mathematics and Physics (GPA: 5.30/6.0), Kantonsschule am Burggraben, St.Gallen

Awards

- 2016 IEEE **George S. Axelby Outstanding Paper Award**²

Employment history

- 2012-2017 Teaching and research assistant in the Department of Electrical Engineering and Information Technology at ETH Zurich, Switzerland
- 2007-2012 Part-time job as a teaching assistant and librarian in the Departments of Electrical and Mechanical Engineering at ETH Zurich, Switzerland
- 2006 Military service (Swiss Army windband, associate principal (clarinet))

Industrial experience

- 2011 Quarter year research internship at IBM Research, Zurich,
Working on an integer programming formulation of railway management
- 2007 Half year internship as software engineer at Helvetia Insurances, St. Gallen,
Development of information system algorithms for the actuarial division

Extracurricular activities

- 2006-2015 Repetition Courses in Military, Swiss Army Symphonic Wind Orchestra³
- 2006-present Clarinetist at the Symphonic Wind Orchestra (Stadtmusik) St. Gallen
- 2007 4 Month language stay in Vancouver, Cambridge English Advanced certificate (CAE)
- 2004 First price at the Swiss Music Junior Championship (SJMw), clarinet

¹Interdisciplinary Master program offered by the Departments of Computer Science, Electrical Engineering and Mechanical Engineering.

²It awards the best paper published in the past two years in the IEEE Transactions on Automatic Control (out of roughly 1000 papers).

³This is the top class orchestra of the Swiss army consisting of the best musicians in the country (with over 80% professional musicians).

Additional skills & interests

- Languages: German (native), English (fluent), French (intermediate) DELF A6
- Programming Languages: C, C++
- Mathematical Software: MATLAB, Mathematica, CVX, Yalmip
- Documentation: L^AT_EX, Microsoft Office
- Personal interests: Clarinet, piano, skiing, mountain biking

Teaching (supervision of exercise classes)

Engineering Materials and Production (2008), Control Systems 1 (2009), Signals and Systems 2 (2012-2017)⁴, Matlab Course (2012-2016)

Student project co-supervisor

- Maxime Thély, *Stochastic Programming with Quasi-Monte Carlo Methods* (M.Sc. Thesis 2017)
- Angeliki Kamoutsi, *Occupation Measures and LMI Relaxations for Infinite Horizon Discounted OCPs* (M.Sc Thesis 2016, Mathematics Departement)
- Maxime Thély, *Maximum Entropy Estimation via Gauss-LP Quadratures* (Semester Thesis 2016)

Reviewing activities

- **Journals:** IEEE Transactions on Automatic Control, IEEE Transactions on Information Theory, SIAM Journal on Optimization, Journal of Mathematical Analysis and Applications
- **Conferences:** IEEE Conference on Decision and Control, European Control Conference

Publications

Journal papers

- (J1) T. Sutter, D. Sutter and J. Lygeros, *Capacity of Random Channels with Large Alphabets*, arXiv:1503.04108, Advances in Mathematics of Communications, 2017, to appear
- (J2) A. Kamoutsi T. Sutter, P. Mohajerin Esfahani and J. Lygeros, *On Infinite Linear Programming and the Moment Approach to Deterministic Infinite Horizon Discounted Optimal Control Problems*, IEEE Control Systems Letters, vol. 1, no. 1, 2017
- (J3) T. Sutter, A. Ganguly, and H. Koepl, *Path Estimation and Variational Inference for Hidden Diffusion Processes*, Journal on Machine Learning Research, vol. 17, 2016
- (J4) D. Sutter, T. Sutter, P. Mohajerin Esfahani and R. Renner, *Efficient Approximation of Quantum Channel Capacities*, IEEE Transactions on Information Theory, vol. 62, no. 1, 2016
- (J5) T. Sutter and J. Lygeros, *Signals and Systems II: A Flipped Classroom Experiment for Undergraduate Control Education*, ASME Control and Dynamics Magazine, 2016
- (J6) T. Sutter, D. Sutter, P. Mohajerin Esfahani and J. Lygeros, *Efficient Approximation of Channel Capacities*, IEEE Transactions on Information Theory, vol. 61, no. 4, 2015
- (J7) P. Mohajerin Esfahani, T. Sutter, and J. Lygeros, *Performance Bounds for the Scenario Approach and an Extension to a Class of Non-convex Programs*, IEEE Transactions on Automatic Control, vol. 60, no. 1, 2015
- (J8) T. Sutter, D. Chatterjee, F. Ramponi, and J. Lygeros, *Isospectral flows on a class of finite-dimensional Jacobi matrices*, Systems and Control Letters, vol. 62, no. 5, 2013

⁴Head teaching assistant, responsible for all the exercise sessions and for a couple of lecture replacements each year.

Conference papers

- (C1) T. Sutter, A. Kamoutsi, P. Mohajerin Esfahani and J. Lygeros, *Data-driven approximate dynamic programming: A linear programming approach*, IEEE Conference on Decision and Control (CDC), 2017
- (C2) M. Thély, T. Sutter, P. Mohajerin Esfahani and J. Lygeros, *Maximum Entropy Estimation via Gauss-LP Quadratures*, IFAC World Congress, 2017
- (C3) T. Sutter, P. Mohajerin Esfahani and J. Lygeros, *Approximation of constrained average cost Markov control processes*, IEEE Conference on Decision and Control (CDC), 2014
- (C4) T. Sutter, D. Sutter, J. Lygeros, *Asymptotic capacity of a random channel*, 52nd Annual Allerton Conference on Communications, Control, and Computing, 2014
- (C5) D. Sutter, T. Sutter, P. Esfahani, J. Lygeros, *Efficient approximation of discrete memoryless channel capacities*, IEEE International Symposium on Information Theory (ISIT), 2014
- (C6) T. Sutter, D. Sutter, P. Esfahani, J. Lygeros, *Capacity approximation of memoryless channels with countable output alphabets*, IEEE International Symposium on Information Theory (ISIT), 2014

Preprints

- (P1) P. Mohajerin Esfahani, T. Sutter, D. Kuhn and J. Lygeros, *From Infinite to Finite Programs: Explicit Error Bounds with an Application to Approximate Dynamic Programming*, arXiv:1701.06379, 2017 (under review in SIAM Journal on Optimization)
- (P2) T. Sutter, D. Sutter, P. Mohajerin Esfahani and J. Lygeros, *Generalized maximum entropy estimation*, arXiv:1708.07311, 2017 (submitted to Journal on Machine Learning Research)

Selected invited talks

- *Generalized maximum entropy estimation*, Seminar Institute of Theoretical Physics, ETHZ, September 2017
- *From infinite to finite programs: explicit error bounds with an application to Approximate Dynamic Programming*, Seminar, IBM Research, Zurich, March 2017
- *From infinite to finite programs: explicit error bounds with an application to Approximate Dynamic Programming*, Seminar, Centre for Mathematical Sciences Cambridge, March 2017
- *From infinite to finite programs: explicit error bounds with an application to Approximate Dynamic Programming*, Control Seminar Series, Oxford, February 2017
- *Performance bounds for the Scenario Approach*, Seminar Institute of Theoretical Physics, ETHZ, February 2016
- *A variational approach to path estimation and parameter inference*, Seminar, IIT Bombay, January 2016
- *An integer programming formulation of railway management*, IBM Research Lab Zurich, Business optimization group, December 2011

Selected contributed talks

- *Decision making under uncertainty: Performance bounds for the scenario approach*, Swiss Operations Research Days, Fribourg, June 2017
- *Maximum entropy estimation via Gauss-LP quadratures*, IFAC World Congress, Toulouse, June 2017
- *Decision making under uncertainty: Performance bounds for the scenario approach*, First Max Planck ETH Workshop on Learning Control, Tübingen, November 2015
- *Performance bound for Approximate Dynamic Programming in Borel spaces*, SIAM Conference on Control and its Applications, Paris, July 2015
- *Approximation of constrained average cost Markov control processes*, IEEE Conference on Decision and Control, Los Angeles, December 2014

- *Asymptotic capacity of a random channel*, Allerton Conference on Communication, Control, and Computing, Illinois, October 2014
- *Capacity approximation of memoryless channels with countable output alphabets*, IEEE International Symposium on Information Theory, Honolulu, June 2014

Doctoral / Masters / Bachelor Theses

- (T1) T. Sutter, *Convex programming in optimal control and information theory*, ETH Zurich, Ph.D. thesis (available soon), advisor: Prof. John Lygeros
- (T2) T. Sutter, *Variational Inference for State Dependent Diffusion Processes*, ETH Zurich, [Master Thesis](#), advisor: Prof. Arnab Ganguly, Prof. Heinz Koepl
- (T3) T. Sutter, *Isospectral Flows on a Class of Finite-Dimensional Jacobi Matrices*, ETH Zurich, [Semester Thesis](#), advisor: Prof. Debasish Chatterjee, Prof. Federico Ramponi, Prof. John Lygeros
- (T4) T. Sutter, *A Dynamical Approach to Create Different Juggling Patterns Using Chaos*, ETH Zurich, [Bachelor Thesis](#), advisor: Prof. Raffaello D'Andrea

References

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(more references available upon request)