

Lukáš Adam

Curriculum Vitae



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*"With the new day comes new strength and new thoughts." –
Eleanor Roosevelt*

Personal details

Born April 7th, 1986
Citizenship Czech Republic

Education

- 2011-2015 **Doctoral Degree in Mathematics**, *Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic.*
- Thesis: Hierarchical problems with evolutionary equilibrium constraints.
 - Supervisor: Jiří Outrata.
- 2009-2011 **Master's Degree in Mathematics**, *Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic.*
- Graduated with honors, received excellence scholarship.
- 2006-2009 **Bachelor's Degree in Mongolian studies**, *Faculty of Arts, Charles University, Prague, Czech Republic.*
- 2005-2008 **Bachelor's Degree in Mathematics**, *Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic.*

Working and research experience

- 2017-present **Junior researcher**, *Southern University of Science and Technology, Shenzhen, China.*
Applied research including the following machine learning topics:
- Accuracy at the Top: Classification problem of determining attack/non-attack on a large dataset where the objective depends on the used classifier.
 - Feature selection for multiclass Support vector machines.
- 2013-present **Senior researcher**, *ÚTIA, Czech Academy of Sciences, Prague, Czech Republic.*
I performed mainly applied research. Selected applications include:
- Engineering applications: In many engineering tasks (tram engines, LCL filters) the goal is to steer the system such that a desired state is reached in minimal time possible. The algorithms have to be suited for the online optimization (computation at run-time).
 - Inverse problems in atmospheric modelling: Identification of a number of particles dispersed into the atmosphere during a potential accident.
 - Theoretical research: Analysis of hierarchical problems, nonsmooth optimization, applications to game theory.
- 2015-2017 **Junior researcher**, *Humboldt University of Berlin, Berlin, Germany.*
Recently, it has been proposed to use optoelectronic contact layers to transmit data in a computer chip. We were interested in an optimal design of such (micro)lasers such that the lasing threshold is minimized. This should make the laser more stable by preventing overheating issues.

2012-2013 **Junior researcher**, *University of West Bohemia*, Pilsen, Czech Republic.
My main task was to provide mathematical support to a team of engineers. The goal was to design an optimal shape of a device separating PVC and PET particles.

Grants

2019-2019 **Robust multi-objective optimization: Application to the recycling of plastic wastes**, *National Natural Science Foundation of China*, applicant.

2017-2019 **Mathematical Modelling of Intransitive Preferences**, *Grant Agency of the Czech Republic*, team member.

2015-2017 **Stability Analysis of Optima and Equilibria in Economics**, *Grant Agency of the Czech Republic*, team member.

2014-2017 **Source-Term Determination of Radionuclide Releases by Inverse Atmospheric Dispersion Modelling (STRADI)**, *Czech-Norwegian Research Programme*, team member.

2014-2014 **Variational and Numerical Analysis in Nonsmooth Continuum Mechanics**, *Grant Agency of the Czech Republic*, team member.

Workshop organization

2018 Organizer of 5th Workshop on Variational Analysis and Optimization, Mariánská.

2017 Organizer of 4th Workshop on Variational Analysis and Optimization, Mariánská.

2016 Organizer of 3rd Workshop on Variational Analysis and Optimization, Mariánská.

2015 Organizer of 2nd Workshop on Variational Analysis and Optimization, Mariánská.

Students

PhD thesis V. Mácha: Distributed stochastic optimization algorithms on large data, In progress (specialist supervisor).

Master thesis M. Drobny: Optimization problems with chance constraints, 2018.

Awards

2015 Winner of the best publication at ÚTIA, Czech Academy of Sciences, 2015; Category: young scientists.

2013 Second place at the Best student scientific research in Theoretical economics 2013 competition organized by the Czech econometric society.
Best student paper award at the COMPUMAG 2013 conference, Budapest, Hungary.

2011 Second place in the Best student thesis at Department of Probability and Mathematical Statistics competition.

Publications

Submitted **21:** L. Adam, V. Mácha, V. Šmídl, T. Pevný: Accuracy at the Top: Convexity or Quantile Estimate Precision? Submitted to *NIPS 2018*.

20: L. Adam, M. Branda, H. Heitsch, R. Henrion: Solving joint chance constrained problems using regularization and Benders' decomposition. Submitted to *Annals of Operations Research*.

19: L. Adam, M. Hintermüller, D. Peschka, T. M. Surowiec: Optimization of a Multiphysics Problem in Semiconductor Laser Design. Submitted to *SIAM Journal on Applied Mathematics*.

Journals **18:** F. Tang, L. Adam, B. Si: Group Feature Selection with Multiclass Support Vector Machine. *Neurocomputing*, DOI 10.1016/j.neucom.2018.07.012.

- 17:** L. Adam, M. Hintermüller, T. M. Surowiec: A PDE-constrained optimization approach for topology optimization of strained photonic devices. *Optimization and Engineering*, DOI 10.1007/s11081-018-9394-5.
- 16:** L. Adam, M. Hintermüller, T. M. Surowiec: A semismooth Newton method with analytical path-following for the H^1 -projection onto the Gibbs simplex. *IMA Journal on Numerical Analysis*, DOI 10.1093/imanum/dry034.
- 15:** V. Šmídl, Š. Janouš, L. Adam, Z. Peroutka: Direct Speed Control of PMSM Drive Using SDRE and Convex Constrained Optimization. *IEEE Transactions on Industrial Electronics* 65:1, 532-542, 2018.
- 14:** L. Adam, P. Bejda: Robust estimators of parameter of location based on the geometric median. *Communications in Statistics - Simulation and Computation* 47:7, 2139-2151, 2018.
- 13:** L. Adam, R. Henrion, J. Outrata: On M-stationarity conditions in MPECs and the associated qualification conditions. *Mathematical Programming* 168: 1-2, 229-259, 2018.
- 12:** L. Adam, T. Kroupa: The intermediate set and limiting superdifferential for coalitional games: between the core and the Weber set. *International Journal of Game Theory*, 46:4, 891-918, 2017.
- 11:** L. Adam, M. Branda: Nonlinear chance constrained problems: optimality conditions, regularization and solvers. *Journal of Optimization Theory and Applications* 170:2, 419-436, 2016.
- 10:** L. Adam, J. Outrata and T. Roubíček: Identification of some nonsmooth evolution systems with illustration on adhesive contacts at small strains. *Optimization* 66:12, 2025-2049, 2017.
- 9:** L. Adam, M. Branda: Sparse optimization for inverse problems in atmospheric modelling. *Environmental Modelling & Software* 79, 256-266, 2016.
- 8:** L. Adam: On the Lipschitz behavior of solution maps of a class of differential inclusions. *Set-Valued and Variational Analysis* 23:3, 559-575, 2015.
- 7:** L. Adam, M. Červinka and M. Pištěk: Normally admissible partitions and calculation of normal cones to a finite union of polyhedral sets. *Set-Valued and Variational Analysis*, 24:2, 207-229, 2016.
- 6:** L. Adam and J. Outrata: On optimal control of a sweeping process coupled with an ordinary differential equation. *Discrete and Continuous Dynamical System - B* 19, 2709-2738, 2014.
- 5:** F. Mach, L. Adam, J. Kacerovský, P. Karban, and I. Doležel: Evolutionary algorithm-based multi-criteria optimization of triboelectrostatic separator. *Journal of Computational and Applied Mathematics* 270, 134-142, 2014.
- Proceedings **4:** V. Šmídl, Š. Janouš, Z. Peroutka, L. Adam: Time-optimal current trajectory for predictive speed control of PMSM drive. *IEEE International Symposium on Predictive Control of Electrical Drives and Power Electronics (PRECEDE)* 83-88, 2017.
- 3:** L. Adam, T. Kroupa: Computing superdifferentials of Lovász extension with application to coalitional games. *16th International Conference, IPMU 2016, Eindhoven, The Netherlands, Proceedings, Part I*, 35-45, 2016.
- 2:** L. Adam. Necessary optimality conditions for an optimal control problem governed by an inclusion with discontinuous right-hand side. In J. Safrankova and J. Pavlu, editors, *WDS-12 Proceedings of Contributed Papers: Part I: Mathematics and Computer Sciences*, pages 7-12. Matfyzpress, 2012.
- 1:** L. Adam. Stochastic programming software: A comparison for investment problem. In M. Dlouhý and V. Skocdoplová, editors, *Proceedings of the 29th International Conference on Mathematical Methods in Economics 2011*, pages 11-16. Professional Publishing, 2011.

Teaching and university position

- 2014-2015 Member of the Student Chamber of the Academic Senate at the Faculty of Mathematics and Physics, Charles University.
- 2015-2016 Seminar: Mathematical Problems of Non-mathematicians (in Czech), Charles University.
- 2012-2015 Seminar: Introduction to Optimization (in Czech), Charles University.
- 2009 Lecture: Introduction to Game theory (in English), Mongolian National University.

Stays abroad

- 2017 *Philipp University of Marburg, Germany*: one week stay to finish a paper.
- 2015 *University of Milan, Italy*: one week stay. *Humboldt University, Berlin, Germany*: stay of two months to enhance knowledge related to optimization with PDE constraints.
- 2014 *University of Birmingham, United Kingdom*: research stay for the duration of two months connected with the STRADI project.
- 2013 *Weierstrass Institute, Berlin, Germany* and *Xlim Laboratory, Limoges, France*: stays at research institutes in the total length of three weeks.
- 2008-2009 *Ulaanbaatar, Mongolia*: study stay.

Conferences with a contribution

- 2018 23rd International Symposium on Mathematical Programming, Bordeaux, France.
International Workshop on Modern Optimization and Applications, Beijing, China.
- 2017 11th International Conference on Parametric Optimization and Related Topics, Prague, Czech.
HCM Workshop Nonsmooth Optimization and its Applications, Bonn, Germany.
- 2016 Central European Set-Valued and Variational Analysis Meeting, Jena, Germany.
ICCOPT 2016, The fifth International Conference on Continuous Optimization, Tokyo, Japan.
- 2015 27th IFIP TC7 Conference 2015 on System Modelling and Optimization, Sophia Antipolis, France.
European Geosciences Union, General Assembly 2015, Vienna, Austria.
- 2014 4th IMA Conference on Numerical Linear Algebra and Optimisation, Birmingham, United Kingdom.
12th EUROPT Workshop on Advances in Continuous Optimization, Perpignan, France.
- 2013 IFIP 2013 System Modelling and Optimization, Klagenfurt, Austria.
ICCOPT 2013, The Fourth International Conference on Continuous Optimization, Lisbon, Portugal.
- 2012 Mathematical Methods in Economy and Industry XVII, Berlin, Germany.
Weak of Doctoral Students 2012, Prague, Czech Republic.
- 2011 Mathematical Methods in Economics 2011, Jánská Dolina, Slovakia.

Other

Reviewer for international journals SIAM Journal on Optimization; Journal of Optimization Theory and Applications; Set-Valued and Variational Analysis; Journal of Mathematical Imaging and Vision; Fuzzy Sets and Systems and others

References

- M. Hintermüller, Professor+Director, Weierstrass Institute for Applied Analysis and Stochastics, Berlin, michael.hintermueller@wias-berlin.de
- Jiří Outrata, Professor, Czech Academy of Sciences, Prague, outrata@utia.cas.cz
- Martin Branda, Assistant Professor, Charles University, Prague, branda@karlin.mff.cuni.cz