

Lukáš Adam

Curriculum Vitae



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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

- 2020-present **Researcher**, *Czech Technical University, Prague, Czech Republic.*
- Cooperation with industrial partners.
 - Accuracy at the top: Classification problem of determining attack/non-attack on a large cybersecurity dataset. The performance is evaluated only on a few top samples.
- 2017-2020 **Research Assistant Professor**, *Southern University of Science and Technology, Shenzhen, China.*
- Distributionally robust optimization: Theoretical research concerning robustness in multi-objective optimization problems.
 - Robust optimization over time: Time-evolving optimization problems where the goal is to find a stable solution.
 - Feature selection for multiclass Support vector machines.
- 2013-2020 **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 online optimization (computation at run-time).
 - Inverse problems in atmospheric modelling: Identification of the 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 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

- 2019 Organizer of 6th Workshop on Variational Analysis and Optimization, Mariánská.
- 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. Drobný: Optimization problems with chance constraints, 2018.

Awards

- 2018 Second place at the best publication at ÚTIA, Czech Academy of Sciences, 2018.
- 2018 Presidential excellence postdoctoral fund, Southern University of Science and Technology, 2018.
- 2015 Winner of the best publication at ÚTIA, Czech Academy of Sciences, 2015; young scientists.
- 2013 Second place at the Best student scientific research in Theoretical economics 2013 competition organized by the Czech econometric society.
- 2011 Second place at the Best student thesis at Department of Probability and Mathematical Statistics competition.

Publications

- Journals **24**: L. Adam, M. Branda: Risk-aversion in data envelopment analysis models with diversification. Accepted to *Omega*.
- 23**: L. Adam, V. Mácha: Projections onto the canonical simplex with additional linear inequalities. Accepted to *Optimization Methods and Software*.

- 22:** L. Adam, M. Hintermüller, D. Peschka, T. M. Surowiec: Optimization of a Multiphysics Problem in Semiconductor Laser Design. *SIAM Journal on Applied Mathematics* 79:1, 257–283, 2019
- 21:** L. Adam, M. Branda, H. Heitsch, R. Henrion: Solving joint chance constrained problems using regularization and Benders' decomposition. Accepted to *Annals of Operations Research*.
- 20:** F. Tang, L. Adam, B. Si: Group Feature Selection with Multiclass Support Vector Machine. *Neurocomputing* 317, 42-49, 2018.
- 19:** L. Adam, M. Hintermüller, T. M. Surowiec: A PDE-constrained optimization approach for topology optimization of strained photonic devices. *Optimization and Engineering* 19:3, 521–557, 2018.
- 18:** 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* 39:3, 1276–1295, 2019.
- 17:** 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.
- 16:** 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.
- 15:** 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.
- 14:** 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.
- 13:** L. Adam, M. Branda: Nonlinear chance constrained problems: optimality conditions, regularization and solvers. *Journal of Optimization Theory and Applications* 170:2, 419-436, 2016.
- 12:** 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.
- 11:** L. Adam, M. Branda: Sparse optimization for inverse problems in atmospheric modelling. *Environmental Modelling & Software* 79, 256-266, 2016.
- 10:** 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.
- 9:** 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.
- 8:** 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.
- 7:** 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 **6:** K. Shang, H. Ishibuchi, W. Chen, L. Adam: Hypervolume optimal μ -distributions on line-based Pareto fronts in three dimensions. *International Conference on Parallel Problem Solving from Nature*, 257-270, 2020.
- 5:** L. Adam, X. Yao: A simple yet effective approach to robust optimization over time. Accepted to *IEEE SSCI 2019*.

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.

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