

# Igor Molybog

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<https://github.com/igormolybog>

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## EDUCATION

### **UNIVERSITY OF CALIFORNIA AT BERKELEY** | PH.D CANDIDATE, IND ENG AND OPERATIONS RESEARCH

2017-2021

Minors in Math and Computer Science

GPA: 3.72 / 4.0

### **MOSCOW INSTITUTE OF PHYSICS AND TECHNOLOGY** | BS IN APPLIED MATH AND PHYSICS

2013-2017

Chair of Intellectual Data Analysis

GPA: 4.97 / 5.0

## SELECTED COURSEWORK

Mathematical Programming and Stochastic Processes

Algorithms and data structures

Machine Learning and Control

Theoretical and Applied Statistics

Real, Complex and Functional Analysis

Differential and Algebraic Geometry

## EXPERIENCE

### **UC BERKELEY** | GRADUATE STUDENT RESEARCHER

Jan 2019 – Dec 2019; June 2018 – Aug 2018 | Berkeley, CA | Advisor: Prof. Javad Lavaei

- Studied conditions for guaranteed convergence in nonconvex optimization (Mathlab+Python)
- Developing novel approaches for Incremental Neural Architecture Search

### **UC BERKELEY** | GRADUATE STUDENT INSTRUCTOR

Aug 2018 – Dec 2018 | Berkeley, CA | Advisor: Prof. Javad Lavaei

- Taught an undergraduate course on Continuous and Discrete Optimization
- Held weekly discussion sessions and office hours for 43 students

### **LOS ALAMOS NATIONAL LABORATORY** | VISITING RESEARCHER

July 2017 – Aug 2017 | Los Alamos, NM | Advisor: Prof. Michael Chertkov

- Developed and proved accelerated algorithm for finding local solution of non-monotone operator equations

### **SKOLKOVO INSTITUTE FOR SCIENCE AND TECHNOLOGY** | RESEARCH INTERN

Oct 2016 – June 2017 | Moscow, Russia | Advisor: Dr. Yury Maximov

- Implemented and tested numerical optimization techniques for the Power Flow problem (Matlab+Python)

### **INSTITUT PASTEUR** | INTERN @ CENTER FOR TECHNOLOGY

July 2016 – Sep 2016 | Paris, France | Advisor: Dr. Samy Gobaa

- Created a proof-of-concept for technology of micro-3D-photolithography with standard automated microscope (Java+Arduino)

### **RAS COMPUTING CENTER** | UNDERGRADUATE RESEARCHER

Sep 2015 – June 2016 | Moscow, Russia

- Developed and implemented a modification of a dimension reduction technique (t-SNE) for performing classification in the reduced-dimension space. Applied for plagiarism detection problem (Python)
- Constructed and tested an alternative features space for evaluation of speeds of transport flows from a traffic dataset (Python)

### **MIPT INTEL LAB** | SOFTWARE ENGINEERING INTERN

Sep 2013 – May 2014 | Moscow, Russia

- Developed interpreter and static binary translator for an Assembly-like programming language (C/C++)

# ACADEMIC ACHIEVEMENTS

## PREPRINTS

- I. Molybog, S. Sojoudi, and J. Lavaei "No Spurious Solutions in Non-convex Matrix Sensing: Structure Compensates for Isometry" [https://lavaei.ieor.berkeley.edu/SRIP\\_2019\\_1.pdf](https://lavaei.ieor.berkeley.edu/SRIP_2019_1.pdf)
- I. Molybog, R. Madani, and J. Lavaei "Conic Optimization for Robust Quadratic Regression" [http://lavaei.ieor.berkeley.edu/Conic\\_RQR\\_2018.pdf](http://lavaei.ieor.berkeley.edu/Conic_RQR_2018.pdf)

## JOURNAL PUBLICATIONS

- I. Molybog and Y. Chechovich "Analysis of heterogeneity of transport flows" in *Advances in Systems Science and Applications*, vol. 17, issue 3, pp. 9-21, 2017
- I. Molybog, A. Motrenko, and V. Strijov "Improving classification quality for the task of finding intrinsic plagiarism" in *Informatika i ee Primeneniya*, vol. 11, issue 3, pp. 59-71, 2017

## CONFERENCE PAPERS

- M. Jin, I. Molybog, R. Mohammadi-Ghazi, and J. Lavaei "Conic optimization for robust quadratic regression: Deterministic bounds and statistical analysis" in *IEEE 58th Conference on Decision and Control*, 2019
- I. Molybog, and J. Lavaei "On Sampling Complexity of the Semidefinite Affine Rank Feasibility Problem" in *Thirty-Third AAAI Conference on Artificial Intelligence*, 2019
- I. Molybog, R. Madani, and J. Lavaei "Conic optimization for robust quadratic regression: Deterministic bounds and statistical analysis" in *IEEE 57th Conference on Decision and Control*, 2018
- I. Molybog, A. Motrenko "t-SNE modification for classification problem" in *Information Technology and Systems 2016: The 40th Interdisciplinary Conference & School*, pp. 265-268, September, 25-30, Repino, St. Petersburg, Russia

## TALKS

- "Frontiers of Deep Learning: overview of Simon's Institute summer workshops" – Control and Optimization seminar, IEOR Department at University of California, Berkeley, CA, 2019
- "Sampling Complexity of Rank Feasibility" – 33rd AAAI Conference on Artificial Intelligence, Honolulu, HI, 2019
- "Conic Optimization For Robust Quadratic Regression" – 57th IEEE Conference on Decision and Control, Miami Beach, FL, 2018
- "Geometry of SDP relaxations for rank constrained problems" – Power Systems Seminar for IEOR Department at University of California, Berkeley, CA, 2018
- "Conic Optimization For Robust State Estimation: Deterministic Bounds And Statistical Analysis" – INFORMS Annual Meeting, Phoenix, AZ, 2018
- "Conic Relaxations for State Estimation under Sparse Noise" – Power Systems Seminar for IEOR Department at University of California, Berkeley, CA, 2018
- "Data analysis for transport flows heterogeneity evaluation" – School «Control, information and optimization», Moscow, Russia, 2017
- "Accessible micro-photolithography for biological labs" – «Amgen European Symposium», University of Cambridge, 2016
- "On dimension reduction for classification quality and acceleration" – School «Control, information and optimization», St. Petersburg, Russia, 2016