Welcome to ICCOPT/MOPTA 2022!

On behalf of the ICCOPT/MOPTA 2022 Local Organizing Committee, Lehigh University, and the Mathematical Optimization Society (MOS), we are excited to welcome you to the jointly organized International Conference on Continuous Optimization (ICCOPT) and Modeling and Optimization: Theory and Applications (MOPTA) conference. This is the seventh ICCOPT and twenty-first MOPTA, and we are extremely pleased to welcome everyone in person to the beautiful campus of Lehigh University in Bethlehem, Pennsylvania, USA.

Organized every three years, ICCOPT is one of the flagship conferences of MOS, covering all aspects of continuous optimization from theory to practice. MOPTA is held on an annual basis and usually involves a smaller, but still diverse group of researchers and practitioners. This year, the conferences are combined, but not for the first time! The second ICCOPT was organized jointly with MOPTA 2007 at McMaster University.

This year’s ICCOPT/MOPTA welcomes approximately 600 participants from around 30 countries throughout the world. It consists of four plenary talks, six semi-plenary talks, twelve clusters forming around twenty tracks of parallel sessions, a Best Poster Prize and session, a Best Paper for Young Researchers Prize and session, and the 14th AIMMS-MOPTA Optimization Modeling Competition and session. The conference is preceded by an exciting two-day summer school.

The world has experienced unprecedented challenges over the past couple of years due to the COVID-19 pandemic. It has affected all of our lives to some extent, and for many its impact has been significant and will be long-lasting. This entire conference has been organized during the pandemic, and while some of the world has been able to return to a semblance of normalcy, the effects of the pandemic continue to linger. For example, unfortunately, many members of our community are unable to attend the conference, and it has caused us to impose certain rules and restrictions that we would have otherwise not had to impose. Yet, despite these challenges, we are extremely pleased to be able to host ICCOPT/MOPTA 2022 in person, and wish all participants a memorable conference!

ICCOPT/MOPTA 2022 would not have been possible without the incredible efforts of our administrative support staff and volunteers, most notably Sarah Wing, Sheila Dorney, and Mark Motsko. We are forever grateful to them for the countless hours that they spent helping us to organize an event under such uncertain circumstances. Thank you to the Program Committee, cluster chairs, sessions chairs, and prize/competition committees for organizing the scientific program, and to the remainder of the Local Organizing Committee for helping to arrange the logistics of the numerous aspects of the conference.

Welcome to Lehigh and ICCOPT/MOPTA 2022!

Sincerely,

Daniel P. Robinson
Frank E. Curtis

Contents

Program Committee . . . . . . . . . . . . . . . . 4
Local Organizing Committee . . . . . . . . . . . 5
Administrative Support Staff . . . . . . . . . . . 5
Cluster Organizers . . . . . . . . . . . . . . . . . 6
Sponsors and Exhibitors . . . . . . . . . . . . . . . 7
Maps . . . . . . . . . . . . . . . . . . . . . . . . . 8
Instructions for Talks . . . . . . . . . . . . . . . 10
Program Overview . . . . . . . . . . . . . . . . . 11
Plenary Talks . . . . . . . . . . . . . . . . . . . . . 12
Semi-Plenary Talks . . . . . . . . . . . . . . . . . 15
Parallel Sessions . . . . . . . . . . . . . . . . . . 18
AIMMS/MOPTA Modeling Competition . . . . 53
Best Paper Session . . . . . . . . . . . . . . . . . 54
Poster Session . . . . . . . . . . . . . . . . . . . . 55
Accommodations . . . . . . . . . . . . . . . . . . 57

We encourage all participants in ICCOPT/MOPTA 2022 to download Lehigh University’s HawkWatch app (available on the App Store and Google Play), which offers access to useful information such as campus maps, as well as quick access to emergency and other services.
Local Organizing Committee

Daniel P. Robinson  
Co-Chair

Frank E. Curtis  
Co-Chair

Tommaso Giovannelli

Aida Khajavirad

Michael O’Neill

Ted Ralphs

Karmel S. Shehadeh

Tamás Terlaky

Luis Zuluaga

Administrative Support Staff

Sheila Dorney

Mark Motsko

Sarah Wing
Sponsors and Exhibitors

Platinum Sponsor

Gold Sponsors

Silver Sponsor

Local Sponsors

Exhibitors

Bronze Sponsor
Maps

A detailed map of Lehigh University’s Asa Packer campus is provided on the following page. For information relevant for ICCOPT/MOPTA 2022, we recommend using the following Google maps on your computer or mobile device.

IMPORTANT: When viewing a map on your mobile device, view the map legend to toggle information on/off.

Click here or on the image below for a Google map of the Bethlehem area, including hotels and restaurants.

Click here or on the image below for a Google map of locations relevant for the Summer School.

Click here or on the image below for a Google map of locations relevant for the main conference.
Instructions for Talks

For Speakers:

Every room for the plenary talks, semi-plenary talks, parallel sessions, special sessions, etc. is equipped with the following:

- lectern
- computer
- screen
- projector
- HDMI connection for laptop
- power outlet (near lectern)

Each room might have the following as well, but these are not guaranteed:

- white board with markers
- chalk board with chalk
- VGA connection for laptop
- VGA (or other)-to-HDMI adaptor
- laser pointer

We recommend that speakers for parallel and special sessions bring their presentation slides on a USB drive and that they are transferred to the in-room computer at least 5-10 minutes before the start of the session. If a speaker plans not to use the in-room computer and plans to connect a laptop instead, then we recommend testing the connection and entire presentation at least 10-15 minutes before the start of the session.

Each presentation should adhere to the following time restrictions:

- plenary and semi-plenary talks: 50 minute presentation + 10 minutes for Q&A
- parallel session talks: 23 minute presentations + 3 minutes for Q&A
- Best Paper session talks: 17 minute presentations + 3 minutes for Q&A
- Best Poster session talks (for judges): 2 minute presentations
- AIMMS/MOPTA Modeling Competition session talks: 20 minute presentations + 6 minutes for Q&A

For Session Chairs:

- Arrive at the session at least 10 minutes before the start time.
- Familiarize yourself with the in-room technology to be able to assist with any issues.
- Contact a student volunteer in the event of a significant issue.
- Ensure that the session runs on time with speakers adhering to the time restrictions above.
- Adhere to the schedule in the program; if a speaker fails to appear, then advice the audience to wait or leave and return later for the subsequent talks, rather than advancing immediately to the next speaker.
<table>
<thead>
<tr>
<th>Sun, July 24</th>
<th>Mon, July 25</th>
<th>Tue, July 26</th>
<th>Wed, July 27</th>
<th>Thu, July 28</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00-9:30am</td>
<td>9:00-10:20am</td>
<td>9:00-10:00am</td>
<td>9:00-10:00am</td>
<td>9:00-10:00am</td>
</tr>
<tr>
<td>Opening</td>
<td>Parallel Sessions</td>
<td>Semi-Plenary Talk(s)</td>
<td>Semi-Plenary Talk(s)</td>
<td></td>
</tr>
<tr>
<td>9:30-10:30am</td>
<td>Tue.1</td>
<td>Suurit Sra</td>
<td>Guanghui Lan</td>
<td></td>
</tr>
<tr>
<td>Plenary Talk</td>
<td>10:20-10:45am</td>
<td>10:00-10:25am</td>
<td>10:00-10:25am</td>
<td></td>
</tr>
<tr>
<td>Asu Ozdaglar</td>
<td>Coffee Break</td>
<td>Coffee Break</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>10:30-10:55am</td>
<td>10:45am-12:05pm</td>
<td>10:25-11:45am</td>
<td>10:25-11:45am</td>
<td></td>
</tr>
<tr>
<td>Coffee Break</td>
<td>Parallel Sessions</td>
<td>11:45am-1:05pm</td>
<td>11:45am-1:10pm</td>
<td></td>
</tr>
<tr>
<td>10:55am-12:15pm</td>
<td>Tue.2</td>
<td>10:20-11:45pm</td>
<td>10:20-11:45pm</td>
<td></td>
</tr>
<tr>
<td>Parallel Sessions</td>
<td>12:05-1:40pm</td>
<td>Lunch Break</td>
<td>Lunch Break</td>
<td></td>
</tr>
<tr>
<td>Mon.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:15-1:40pm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lunch Break</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:40-3:00pm</td>
<td>1:40-3:00pm</td>
<td>2:05-2:20pm Break</td>
<td>2:05-2:20pm Break</td>
<td></td>
</tr>
<tr>
<td>Parallel Sessions</td>
<td>Tue.3</td>
<td>2:00-3:40pm</td>
<td>2:30-2:55pm</td>
<td></td>
</tr>
<tr>
<td>Mon.2</td>
<td></td>
<td>Parallel Sessions</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:00-3:25pm</td>
<td>Wed.1</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>Coffee Break</td>
<td>3:00-3:25pm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:25-4:25pm</td>
<td>3:25-4:45pm</td>
<td>3:40-4:00pm</td>
<td>3:55-4:15pm</td>
<td></td>
</tr>
<tr>
<td>Plenary Talk</td>
<td>Parallel Sessions</td>
<td>Lunch Break</td>
<td>Closing remarks</td>
<td></td>
</tr>
<tr>
<td>(s)</td>
<td>Tue.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daniel Kuhn</td>
<td>4:05-5:00pm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and Angelia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nedich</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:25-4:40pm Break</td>
<td>4:45-5:00pm Break</td>
<td>5:00-6:00pm</td>
<td>5:00-6:00pm</td>
<td></td>
</tr>
<tr>
<td>4:40-6:00pm</td>
<td>Best Paper Session(s)</td>
<td>14th AIMMS/MOPTA Modeling Competition</td>
<td>14th AIMMS/MOPTA Modeling Competition</td>
<td></td>
</tr>
<tr>
<td></td>
<td>sponsored by SAS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5:30-8:00pm</td>
<td>Welcome Reception and Check-in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6:00-8:00pm</td>
<td>Poster Session</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6:20-7:00pm</td>
<td>Break</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7:00-10:00pm</td>
<td>Conference Dinner</td>
<td></td>
<td>6:00-8:00pm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Student Social</td>
<td></td>
</tr>
<tr>
<td>14th AIMMS/MOPTA Modeling Competition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Asu Ozdaglar  
Massachusetts Institute of Technology

**Independent Learning Dynamics for Stochastic Games:**  
**Where Game Theory Meets Reinforcement Learning**

Abstract: Reinforcement learning (RL) has had tremendous successes in many artificial intelligence applications. Many of the forefront applications of RL involve multiple agents, e.g., playing chess and Go games, autonomous driving, and robotics. Unfortunately, classical RL framework is inappropriate for multi-agent learning as it assumes an agent’s environment is stationary and does not take into account the adaptive nature of opponent behavior. In this talk, I focus on stochastic games for multi-agent reinforcement learning in dynamic environments and develop independent learning dynamics for stochastic games: each agent is myopic and chooses best-response type actions to other agents’ strategies independently, meaning without any coordination with her opponents. There has been limited progress on developing convergent best-response type independent learning dynamics for stochastic games. I will present our recently proposed independent learning dynamics that guarantee convergence in stochastic games, including for both zero-sum and identical-interest settings. Along the way, I will also reexamine some classical and recent results from game theory and RL literatures, to situate the conceptual contributions of our independent learning dynamics and the mathematical novelties of our analysis.

**Biography:** Asuman Ozdaglar received the B.S. degree in electrical engineering from the Middle East Technical University, Ankara, Turkey, in 1996, and the S.M. and the Ph.D. degrees in electrical engineering and computer science from the Massachusetts Institute of Technology, Cambridge, in 1998 and 2003, respectively. She is the MathWorks Professor of Electrical Engineering and Computer Science in the Electrical Engineering and Computer Science (EECS) Department at the Massachusetts Institute of Technology. She is the department head of EECS and the Deputy Dean of Academics in the Schwarzman College of Computing. Her research expertise includes optimization theory, with emphasis on nonlinear programming and convex analysis, game theory, with applications in communication, social, and economic networks, distributed optimization and control, and network analysis with special emphasis on contagious processes, systemic risk and dynamic control. She is the recipient of a Microsoft fellowship, the MIT Graduate Student Council Teaching award, the NSF Career award, the 2008 Donald P. Eckman award of the American Automatic Control Council. She is an IEEE fellow and served on the Board of Governors of the Control System Society in 2010. She was an associate editor for IEEE Transactions on Automatic Control and the inaugural area co-editor for the area entitled “Games, Information and Networks” in the journal Operations Research. She is the co-author of the book entitled Convex Analysis and Optimization (Athena Scientific, 2003).
Safeguarded Augmented Lagrangian Methods for Nonconvex Optimization: Convergence, Complexity and Experiments

Room: Zoellner Arts Center, Baker Hall

Abstract: Safeguarded augmented Lagrangian methods are suitable tools for solving nonconvex nonlinear programming problems. Their convergence theory, based on weak assumptions, is well understood, even in the case of infeasible problems. Iteration and evaluation complexity results are also known. But it is their practical advantages that make them attractive to tackle real-world problems. On the one hand, implementations that exploit second-order information, and some that even possess convergence to second-order stationary points, are available. On the other hand, however, it is the first-order matrix-free implementations that can more efficiently deal with real-world large-scale problems. This talk will cover both theoretical and practical elements and applications of the augmented Lagrangian method Algencan. In particular, recent complexity results and a comprehensive numerical comparison will be reported.

Biography: Ernesto G. Birgin graduated in Computer Science at the University of Buenos Aires in 1995 and received his PhD in Applied Mathematics at the State University of Campinas in 1998. He is full professor at the University of São Paulo since 2015, where he has been working since 1999. His areas of interest include numerical optimization and operations research. He has published over 100 articles in international journals and is the author, together with J. M. Martinez, of the book Practical Augmented Lagrangian Methods for Constrained Optimization, published by SIAM in 2014. He currently serves as associate editor of the journals Bulletin of Computational Applied Mathematics, CLEI Electronic Journal, Computational and Applied Mathematics, Computational Optimization and Applications, International Transactions in Operational Research, Journal of Global Optimization, Mathematics of Computation, Mathematical Programming Computation, Pesquisa Operacional, and Springer Nature Operations Research Forum.
Exploring the Sparsity of Large-Scale Statistical Optimization Problems

Abstract: It has been widely recognized that the structured sparsity of the optimal solutions is an intrinsic property for large-scale optimization problems arising from modern applications in the big data era. In this talk, we shall first illustrate the structured sparsity of the solutions via some popular machine learning models. In particular, we shall show that the solution of the convex clustering model can be highly structurally sparse even if the solution itself is fully dense. We shall then introduce a dual semismooth Newton based proximal point algorithm (PPDNA) and explain why it can be much more efficient than the first-order methods for solving a class of large-scale optimization problems arising from machine learning. The key point is to adaptively make use of the second-order sparsity of the solutions in addition to the data sparsity so that, at each iteration, the computational costs of the second-order methods can be comparable or even lower than those of the first-order methods. Equipped with the PPDNA, we shall then introduce some adaptive sieving methodologies to generate solution paths for large-scale optimization problems with structured sparsity of particular importance in applications. In the last part of the talk, we shall illustrate the high efficiency of our approach with extensive numerical results on several important models including convex clustering, lasso, and exclusive lasso.

Biography: Defeng Sun is currently Chair Professor of Applied Optimization and Operations Research at the Hong Kong Polytechnic University and the President of the Hong Kong Mathematical Society. He mainly publishes in non-convex continuous optimization and machine learning. He received the Beale-Orchard-Hays Prize for excellence in computational mathematical programming from the MOS in 2018. He is a Fellow of SIAM and CSIAM.
**Semi-Plenary Talks**

**Daniel Kuhn**  
*École Polytechnique Fédérale de Lausanne (EPFL)*

**On the Interplay of Optimal Transport and Distributionally Robust Optimization**

Room: Zoellner Arts Center, Baker Hall

Abstract: Optimal Transport (OT) seeks the most efficient way to morph one probability distribution into another one, and Distributionally Robust Optimization (DRO) studies worst-case risk minimization problems under distributional ambiguity. It is well known that OT gives rise to a rich class of data-driven DRO models, where the decision-maker plays a zero-sum game against nature who can adversely reshape the empirical distribution of the uncertain problem parameters within a prescribed transportation budget. Even though generic OT problems are computationally hard, the Nash strategies of the decision-maker and nature in OT-based DRO problems can often be computed efficiently. In this talk we will uncover deep connections between robustification and regularization, and we will disclose striking properties of nature’s Nash strategy, which implicitly constructs an adversarial training dataset. We will also show that OT-based DRO offers a principled approach to deal with distribution shifts and heterogeneous data sources, and we will highlight new applications of OT-based DRO in machine learning, statistics, risk management and control. Finally, we will argue that, while OT is useful for DRO, ideas from DRO can also help us to solve challenging OT problems.

**Biography:** Daniel Kuhn holds the Chair of Risk Analytics and Optimization at EPFL. Before joining EPFL, he was a faculty member at Imperial College London (2007-2013) and a postdoctoral researcher at Stanford University (2005-2006). He received a PhD in Economics from the University of St. Gallen in 2004 and an MSc in Theoretical Physics from ETH Zurich in 1999. His research interests revolve around optimization under uncertainty. For his webpage, go [here](#).

**Monday, 3:25pm - 4:25pm**

**Angelia Nedich**  
*Arizona State University*

**Random Methods for Large-Scale Constrained Optimization Problems**

Room: Rauch 184, Perella Auditorium

Abstract: The optimization problems with a large number of constraints are emerging in many application domains such as optimal control, reinforcement learning, and statistical learning, and artificial intelligence, in general. The challenges posed by the size of the problems in these applications resulted in prolific research in the domain of optimization theory and algorithms. Many refinements and accelerations of various (mainly) first-order methods have been proposed and studied, majority of which solves a penalized re-formulation of the original problem in order to cope with the large number of constraints. While the main focus has been on the penalized variants, this talk is offering an alternative approach to these problems. The talk will focus on a different viewpoint and discuss the optimization methods that use randomization to deal with a large number of constraints. The performance and efficiency of such algorithms will be addressed, as well as auxiliary theory that supports them.

**Biography:** Angelia Nedich has a Ph.D. from Moscow State University, Moscow, Russia, in Computational Mathematics and Mathematical Physics (1994), and a Ph.D. from Massachusetts Institute of Technology, Cambridge, USA in Electrical and Computer Science Engineering (2002). She has worked as a senior engineer in BAE Systems North America, Advanced Information Technology Division at Burlington, MA. Currently, she is a faculty member of the school of Electrical, Computer and Energy Engineering at Arizona State University at Tempe. Prior to joining Arizona State University, she has been a Willard Scholar faculty member at the University of Illinois at Urbana-Champaign. She is a recipient (jointly with her co-authors) of the Best Paper Award at the Winter Simulation Conference 2013 and the Best Paper Award at the International Symposium on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks (WiOpt) 2015. Her general research interest is in large scale complex systems dynamics and optimization.
Semi-Plenary Talks

Wednesday, 9:00am - 10:00am

Suvrit Sra
Massachusetts Institute of Technology

Two Surprises When Optimization Theory Meets Machine Learning Practice

Room: Zoellner Arts Center, Baker Hall

Abstract: It is well-known that there are large gaps between optimization theory and machine learning practice. However, there are two even more surprising gaps that have persisted at the fundamental level. The first one arises from ignoring the elephant in the room: non-differentiable non-convex optimization, e.g., when training a deep ReLU network. The second surprise is more disturbing: it uncovers a non-convergence phenomenon in the training of deep networks, and as a result it challenges existing convergence theory and training algorithms. Both these fundamental surprises open new directions of research, and I will talk about some of our theoretical progress on these, as well as potential research questions.

Biography: I work in machine learning, optimization, and math – where I care about fundamental theoretical and algorithmic questions as well as applications. The focus of my research is mathematics of ML / Data Science. A main component of my work is optimization for ML, especially non-convex optimization, including non-Euclidean and geometric optimization. Other key topics of interest to me: discrete probability, theory of deep learning, optimal transport, convex geometry, polynomials, non-Euclidean statistics, etc.

Wednesday, 1:05pm - 2:05pm

Pablo A. Parrilo
Massachusetts Institute of Technology

Shortest Paths in Graphs of Convex Sets, and their Applications

Room: Rauch 184, Perella Auditorium

Abstract: Given a graph, the shortest-path problem requires finding a sequence of edges of minimum cost connecting a source vertex to a target vertex. In this talk we introduce a generalization of this classical problem in which the position of each vertex in the graph is a continuous decision variable, constrained to lie in a corresponding convex set, and the cost of an edge is a convex function of the positions of the vertices it connects. Problems of this form arise naturally in motion planning of autonomous vehicles, robot navigation, and even optimal control of hybrid dynamical systems. The price for such a wide applicability is the complexity of this problem, which is easily seen to be NP-hard. We discuss this novel formulation along with different solution approaches, including a strong mixed-integer convex formulation based on perspective functions. This formulation has a very tight convex relaxation and makes it possible to efficiently find globally-optimal paths in large graphs and in high-dimensional spaces.

Biography: Pablo A. Parrilo is the Joseph F. and Nancy P. Keithley Professor of Electrical Engineering and Computer Science at MIT, with a joint appointment in Mathematics. He is affiliated with the Laboratory for Information and Decision Systems (LIDS) and the Operations Research Center (ORC). Past appointments include Assistant Professor at the Automatic Control Laboratory of the Swiss Federal Institute of Technology (ETH Zurich), and Visiting Associate Professor at the California Institute of Technology. He received an Electronics Engineering undergraduate degree from the University of Buenos Aires, and a PhD in Control and Dynamical Systems from the California Institute of Technology. His research interests include mathematical optimization, machine learning, control and identification, robustness analysis and synthesis, and the development and application of computational tools based on convex optimization and algorithmic algebra to practically relevant engineering problems. Prof. Parrilo has received several distinctions, including the Donald P. Eckman Award of the American Automatic Control Council, the SIAM Activity Group on Control and Systems Theory (SIAG/CST) Prize, the IEEE Antonio Ruberti Young Researcher Prize, and the Farkas Prize of the INFORMS Optimization Society. He is an IEEE and SIAM Fellow.
Semi-Plenary Talks

Wednesday, 1:05pm - 2:05pm

Akiko Takeda  
The University of Tokyo

Bilevel Optimization for Some Machine Learning Problems

Room: Zoellner Arts Center, Baker Hall

Abstract: Recently, bilevel optimization methods have been actively studied in machine learning (ML). Various ML models are described as bilevel optimization problems, and new approaches that take advantage of the characteristics of the models have been proposed. One of the representative ML applications of bilevel optimization is hyperparameter optimization. Most ML models are equipped with parameters that need to be prefixed, and such parameters are often called hyperparameters. In this talk, we review some bilevel formulations and approaches developed for optimizing an ML model together with hyperparameter values. The talk will explore new bilevel formulations of hyperparameter optimization for more complicated ML models that are formulated as nonsmooth optimization problems and bilevel optimization problems and show new solution methodologies.

Biography: Akiko Takeda received the Doctor of Science degree in information science from the Tokyo Institute of Technology, Japan, in 2001. She is currently a professor in the Department of Creative Informatics, The University of Tokyo, and the team leader of Continuous Optimization Team at Center for Advanced Intelligence Project, RIKEN, Tokyo, Japan. Prior to that, she was a researcher at Toshiba Corporation, an assistant professor at Tokyo Institute of Technology, an associate professor at Keio University, an associate professor at University of Tokyo, and a professor at the Institute of Statistical Mathematics. Her current focus is on the development of solution approaches in decision making problems under uncertainty and in nonconvex optimization problems such as the difference of convex optimization. Her work is motivated by optimization tasks with applications in operations research, machine learning, and control systems. She currently serves as an Associate Editor for SIAM Journal on Optimization.

Thursday, 9:00am - 10:00am

Guanghui (George) Lan  
Georgia Institute of Technology

Policy Mirror Descent for Reinforcement Learning

Room: Zoellner Arts Center, Baker Hall

Abstract: Reinforcement Learning (RL) has attracted considerable interest from both industry and academia during the past few years. The study of RL algorithms with provable rates of convergence, however, is still in its infancy. In this talk, we discuss some recent progresses that bridge stochastic nonlinear programming with RL. We pay special attention to online reinforcement learning, which intends to continuously improve the system performances in-situ, when better and better policies are being discovered and deployed. More specifically, we introduce a new and general class of policy mirror descent (PMD) methods and show that they achieve linear convergence for the deterministic case and optimal sampling complexity for the stochastic case for discounted Markov decision processes. We also show how the gradient information can be estimated efficiently online through a few recently proposed conditional temporal difference methods. Extensions of these algorithms for the average reward and block coordinate settings will also be discussed.

Biography: Guanghui (George) Lan is an A. Russell Chandler III professor in the H. Milton Stewart School of Industrial and Systems Engineering at Georgia Institute of Technology. Dr. Lan was on the faculty of the Department of Industrial and Systems Engineering at the University of Florida from 2009 to 2015, after earning his Ph.D. degree from Georgia Institute of Technology in August 2009. His main research interests lie in optimization and machine learning. The academic honors he received include the Mathematical Optimization Society Tucker Prize Finalist (2012), INFORMS Junior Faculty Interest Group Paper Competition First Place (2012) and the National Science Foundation CAREER Award (2013). Dr. Lan serves as an associate editor for Mathematical Programming, SIAM Journal on Optimization and Computational Optimization and Applications. He is also an associate director of the Center for Machine Learning at Georgia Tech.
Parallel Sessions

Monday, 10:55am - 12:15pm

Applications of Continuous Optimization  
Chandler-Ullmann 116

Session Title: Applications of Continuous Optimization Techniques in Integer Optimal Control
Organizer(s): Paul Manns
Chair(s): Paul Manns
Speaker #1: Alexandra Grötinger, Convex Relaxations of Parabolic Optimal Control Problems with Combinatorial Switching Constraints
Speaker #2: Marvin Severitt, Graph-Based Approaches for Discrete Subproblems Arising in Integer Optimal Control
Speaker #3: Annika Müller, Finite Element Approximation of Optimal Control Problems Arising in Data-Driven Analysis

Derivative Free Optimization  
Chandler-Ullmann 216

Session Title: Recent Advances in Derivative-Free Optimization
Organizer(s): Raghu Bollapragada, Jeffrey Larson
Chair(s): Raghu Bollapragada, Jeffrey Larson
Speaker #1: Cem Karamanli, Derivative-Free Optimization via Adaptive Sampling Strategies
Speaker #2: Albert Berahas, Analysis of Line Search and Trust Region Methods with Noise
Speaker #3: Shima Dezfulian, Exploiting Prior Function Evaluations in Derivative-Free Optimization

Nonlinear Optimization  
Rauch 241

Session Title: Emerging Applications of Nonlinear Constrained Optimization
Organizer(s): Charlie Vanaret, Sven Leyffer
Chair(s): Charlie Vanaret, Sven Leyffer
Speaker #1: Daniel P. Robinson, Inexact First- and Second-Order Methods for Sparse Optimization
Speaker #2: Marieme Ngom, A Novel Acquisition Function for Bayesian Optimization
Speaker #3: Sven Leyffer, Binary Control Pulse Optimization for Quantum Systems

Nonlinear Optimization  
Rauch 201

Session Title: New Trends in Continuous Optimization Algorithms and Applications I
Organizer(s): Ernesto G. Birgin, Luis Felipe Bueno
Chair(s): Ernesto G. Birgin, Luis Felipe Bueno
Speaker #1: Luís Felipe Bueno, Inexact Restoration for Minimization with Inexact Evaluation both of the Objective Function and the Constraints
Speaker #2: Douglas S. Gonçalves, A Two-Phase Rank-based Algorithm for Low-Rank Matrix Completion

Nonsmooth Optimization  
Rauch 085

Session Title: Advances in Large-Scale Nonsmooth Optimization I
Organizer(s): Mateo Díaz, Ben Grimmer
Chair(s): Mateo Díaz, Ben Grimmer
Speaker #1: Javier Peña, Affine Invariant Convergence Rates of the Conditional Gradient Method
Speaker #2: Lijun Ding, Revisiting Spectral Bundle Methods: Primal-dual (Sub)linear Convergence Rates
Speaker #3: Saeed Hajizadeh, On Nonsmooth Nonconvex-Nonconcave Minimax Optimization
Parallel Sessions

Optimization for Data Science and Machine Learning
Rauch 101
Session Title: Federated Learning and Optimization Under Data Heterogeneity
Organizer(s): Krishna Pillutla
Chair(s): Krishna Pillutla
Speaker #1: Samuel Horvath, Recipes for Better Use of Local Work in Federated Learning
Speaker #2: Anastasia Koloskova, An Improved Analysis of Gradient Tracking for Decentralized Machine Learning
Speaker #3: Krishna Pillutla, Federated Learning with Heterogeneous Data: A Superquantile Optimization Approach

Optimization for Data Science and Machine Learning
Rauch 137
Session Title: New Problem Formulations for Federated Learning
Organizer(s): Elnur Gasanov
Chair(s): Elnur Gasanov
Speaker #1: Tian Li, Personalized Federated Learning: Interplays with Competing Constraints and Beyond
Speaker #2: Ahmed Khaled, FLIX: A Simple and Communication-Efficient Alternative to Local Methods in Federated Learning
Speaker #3: Slavomir Hanzely, Convergence Theory for Meta-Learning with First-Order Updates

Optimization Under Uncertainty
Rauch 171
Session Title: Application of Adaptive Robust Optimization
Organizer(s): Amadreza Marandi
Chair(s): Zhao Kang
Speaker #1: Zhao Kang, Robust Spare Parts Inventory Management
Speaker #2: Arkajyoti Roy, Optimal Interventions in Robust Optimization with Time-Dependent Uncertainty

Optimization Under Uncertainty
Rauch 141
Session Title: Data-Driven Robust Optimization
Organizer(s): Sebastian Pokutta, Kartikey Sharma
Chair(s): Kartikey Sharma
Speaker #1: Kartikey Sharma, Distributionally Robust Optimization over Time
Speaker #2: Enlu Zhou, Bayesian Distributionally Robust Optimization
Speaker #3: Yibo Zeng, Hypothesis-class-free Generalization via Distributionally Robust Optimization

Optimization Under Uncertainty
Rauch 184
Session Title: Optimization with Marginals
Organizer(s): Karthik Natarajan
Chair(s): Karthik Natarajan
Speaker #1: Divya Padmanabhan, Extremal Probability Bounds in Combinatorial Optimization
Speaker #2: Changchun Liu, Product and Ancillary Pricing Optimization: Market Share Analytics via Perturbed Utility Model
Speaker #3: Arjun Ramachandra, Tight Probability Bounds with Pairwise Independence
### Parallel Sessions

#### Optimization Under Uncertainty
- **Session Title:** Tackling Bias in Data-Driven Optimization: Fundamental Limits and New Approaches  
  Organizer(s): Vishal Gupta  
  Chair(s): Michael Huang  
  Speaker #1: **Michael Huang**, Debiasing In-Sample Performance for Block Angular Linear Optimization  
  Speaker #2: **Henry Lam**, On the Impossibility of Statistically Improving Empirical Optimization: A Second-Order Stochastic Dominance Perspective  
  Speaker #3: **Andrew Li**, Causal Inference for Panel Data with General Treatment Patterns

#### Semidefinite, Conic, and Polynomial Optimization
- **Session Title:** Convex and Nonconvex Methods for Matrix Factorization Problems I  
  Organizer(s): Mateo Díaz, Oscar Leong, Yong Sheng Soh  
  Chair(s): Mateo Díaz, Oscar Leong, Yong Sheng Soh  
  Speaker #1: **Yuejie Chi**, Accelerating Ill-Conditioned Low-Rank Matrix and Tensor Estimation via Scaled Gradient Descent  
  Speaker #2: **Baturalp Yalcin**, Factorization Approach for Low-complexity Matrix Completion Problems: Exponential Number of Spurious Solutions and Failure of Gradient Methods

#### Semidefinite, Conic, and Polynomial Optimization
- **Session Title:** Polynomial Optimization: Theory and Application to Nonlinear Systems and PDEs I  
  Organizer(s): Milan Korda  
  Chair(s): Giovanni Fantuzzi  
  Speaker #1: **Giovanni Fantuzzi**, Verification of Some Functional Inequalities via Polynomial Optimization  
  Speaker #2: **Cheng Guo**, Copositive Duality for Nonconvex Energy Markets

#### Semidefinite, Conic, and Polynomial Optimization
- **Session Title:** Recent Advances in SDP I  
  Organizer(s): Renata Sotirov  
  Chair(s): Etienne de Klerk  
  Speaker #1: **Etienne de Klerk**, Two Applications of Semidefinite Programming in Approximation Theory  
  Speaker #2: **Frank de Meijer**, The Chvatal-Gomory Procedure for Integer SDPs with Applications in Combinatorial Optimization  
  Speaker #3: **Sven Polak**, Semidefinite Approximations for Bicliques and Bi-independent Pairs

#### Software
- **Session Title:** Disciplined Parameterized Programming with CVXPY  
  Organizer(s): Steven Diamond  
  Chair(s): Steven Diamond  
  Speaker #1: **Steven Diamond**, Convex Optimization in Python with CVXPY  
  Speaker #2: **Parth Nobel**, Explainable ML and Sequential Decision Making via CVXPYlayers  
  Speaker #3: **Maximilian Schaller**, CVXPYgen - Code Generation for Parametrized Convex Optimization

#### Stochastic Algorithms
- **Session Title:** Policy Optimization for Reinforcement Learning  
  Organizer(s): Yuejie Chi  
  Chair(s): Yuejie Chi  
  Speaker #1: **Shaofeng Zou**, Policy Gradient Method for Robust Reinforcement Learning  
  Speaker #2: **Siva Theja Maguluri**, Sample Complexity of Policy-Based Methods under Off-Policy Sampling and Linear Function Approximation  
  Speaker #3: **Jincheng Mei**, Understanding the Effect of Stochasticity in Policy Optimization
Stochastic Algorithms
Session Title: Recent Advances in First-Order Methods
Organizer(s): Yibo Xu
Chair(s): Yibo Xu
Speaker #1: Lihua Lei, Adaptivity of Stochastic Gradient-based Methods
Speaker #2: Yang Luo, Halpern-Type Accelerated and Splitting Algorithms For Monotone Inclusions
Speaker #3: Yibo Xu, Distributed Stochastic Inertial-Accelerated Methods with Delayed Derivatives for Non-convex Problems

Variational Inequalities, Complementarity, Games, and Equilibria
Session Title: First-Order Methods For Linear Programming
Organizer(s): Haihao Lu
Chair(s): Haihao Lu
Speaker #1: Oliver Hinder, Faster First-Order Primal-Dual Methods for Linear Programming using Restarts and Sharpness
Speaker #2: Haihao (Sean) Lu, Infeasibility Detection with Primal-Dual Hybrid Gradient for Large-Scale Linear Programming

Monday, 1:40pm - 3:00pm

Convexification and Global Optimization
Session Title: Polynomial Optimization Methods and Applications
Organizer(s): Chen Chen
Chair(s): Chen Chen
Speaker #1: Kyungchan Park, Convex Relaxation for Quadratic Optimization over the Stiefel Manifold
Speaker #2: Chen Chen, Rank Pump for Polynomial Optimization

Derivative Free Optimization
Session Title: Using Curvature Information in Derivative-Free Optimization
Organizer(s): Jeffrey Larson
Chair(s): Stefan Wild
Speaker #1: Bumsu Kim, Curvature-Aware Derivative Free Optimization
Speaker #2: Shiqing Sun, Efficient Algorithm with Stochastic Diagonal Hessian Estimation
Speaker #3: Sara Shashaani, Stochastic Derivative-Free Trust-region Methods Using Diagonal Hessians

Nonlinear Optimization
Session Title: Algorithms for Nonlinear Optimization I
Organizer(s): Johannes Brust, Elizabeth Wong
Chair(s): Johannes Brust, Elizabeth Wong
Speaker #1: Jennifer Erway, Advances in Multipoint Secant Methods
Speaker #2: William Hager, A Hessian-Based Implementation of the Polyhedral Active Set Algorithm
Speaker #3: Robert Bassett, One-Step Estimation with Scaled Proximal Methods
### Nonlinear Optimization

**Session Title**: New Trends in Continuous Optimization Algorithms and Applications II  
**Organizer(s)**: Ernesto G. Birgin, Luis Felipe Bueno  
**Chair(s)**: Ernesto G. Birgin, Luis Felipe Bueno  
**Speaker #1**: Rafaela Filippozzi, Frank-Wolfe Algorithms for Convex Hull Membership Problems  
**Speaker #2**: Davoud Ataee Tarzanagh, On Online Bilevel Learning: Dynamic Regret Analysis of Alternating Optimization Methods  
**Speaker #3**: Maryam Yashtini, Counting Objects by Diffused Index: Geometry-free and Training-free Approach

### Nonlinear Optimization

**Session Title**: Recent Advances in Nonlinear Constrained Optimization  
**Organizer(s)**: Sven Leyffer, Charlie Vanaret  
**Chair(s)**: Sven Leyffer, Charlie Vanaret  
**Speaker #1**: Frank E. Curtis, Sequential Quadratic Optimization for Nonlinear Equality Constrained Stochastic Optimization  
**Speaker #2**: Charlie Vanaret, UNO: A Modular Open-Source Solver for Unifying Nonlinear Optimization  
**Speaker #3**: Michael Saunders, Experiments with Algorithm NCL for Constrained Optimization

### Nonsmooth Optimization

**Session Title**: Advances in Large-Scale Nonsmooth Optimization II  
**Organizer(s)**: Benjamin Grimmer, Mateo Diaz  
**Chair(s)**: Benjamin Grimmer, Mateo Diaz  
**Speaker #1**: Zhihui Zhu, Exactly- and Over-Parameterized Subgradient Methods for Robust Matrix Recovery  
**Speaker #2**: Haoyue Wang, Linear Regression with Partially Mismatched Data: Local Search with Theoretical Guarantees  
**Speaker #3**: Mahyar Fazlyab, Scalable Verification of Deep Neural Networks via Operator Splitting

### Optimization for Data Science and Machine Learning

**Session Title**: Optimization Techniques in Differential Privacy  
**Organizer(s)**: Cristobal Guzman  
**Chair(s)**: Cristobal Guzman  
**Speaker #1**: Tomas Gonzalez, Differentially Private Stationary Points in Stochastic Nonconvex Optimization  
**Speaker #2**: Michael Menart, Differentially Private Generalized Linear Models  
**Speaker #3**: Clement Lezane, Algorithms for Stochastic Complementary Composite Minimization

### Optimization for Data Science and Machine Learning

**Session Title**: Recent Advancements in Optimization Methods for Machine Learning I  
**Organizer(s)**: Nicolas Loizou, Sebastian Stich  
**Chair(s)**: Nicolas Loizou, Sebastian Stich  
**Speaker #1**: Sebastian Stich, On the Communication Complexity of Local Gradient Methods  
**Speaker #2**: Brandon Amos, Amortized Optimization

### Optimization Under Uncertainty

**Session Title**: Advances in Markov Decision Processes  
**Organizer(s)**: Julien Grand-Clement  
**Chair(s)**: Julien Grand-Clement  
**Speaker #1**: Abhishek Gupta, Learning in Infinite Dimensional Spaces  
**Speaker #2**: Julien Grand-Clement, A First-Order Approach to Accelerated Value Iteration
**Optimization Under Uncertainty**

Session Title: Application of Robust Optimization  
Organizer(s): Ahmadreza Marandi  
Chair(s): Yingxiao Ye  
Speaker #1: Yingxiao Ye, Preserving Biodiversity via Adjustable Robust Optimization  
Speaker #2: Ayoub Foussoul, LP-based Approximations for Disjoint Bilinear and Two-Stage Adjustable Robust Optimization

---

**Optimization Under Uncertainty**

Session Title: Distributionally Robust Optimization  
Organizer(s): Ruiwei Jiang  
Chair(s): Ruiwei Jiang  
Speaker #1: Louis Chen, Asymptotically Exact Rockafellian Formulations in Optimization under Uncertainty  
Speaker #2: Harsha Gangammanavar, Sequential Sampling-based Solution Algorithms for Two-stage Distributionally Robust Optimization  
Speaker #3: Ruiwei Jiang, Value of Stochastic Modeling with Right-Hand Side Uncertainty

---

**PDE Constrained Optimization**

Session Title: Algorithmic Advances in Applications of PDE Constrained Optimization I  
Organizer(s): Denis Ridzal, Drew P. Kouri, Harbir Antil  
Chair(s): Denis Ridzal, Drew P. Kouri, Harbir Antil  
Speaker #1: Denis Ridzal, ALESQP-RISK: A Scalable and Efficient Algorithm for Nonsmooth Risk-Averse Optimal Control with State Constraints  
Speaker #2: Brendan Keith, Adaptive Sampling for the Augmented Lagrangian Method

---

**Semidefinite, Conic, and Polynomial Optimization**

Session Title: Approximation Hierarchies for Polynomial Optimization Problems I  
Organizer(s): Monique Laurent, Lucas Slot  
Chair(s): Lucas Slot  
Speaker #1: Lorenzo Baldi, On Putinar’s Positivstellensatz and Convergence Rates in Polynomial Optimization  
Speaker #2: Sergio Cristancho, Harmonic Hierarchies for Polynomial Optimization  
Speaker #3: Lucas Slot, Convergence Analysis of the Sum-of-Squares Hierarchy for Polynomial Optimization

---

**Semidefinite, Conic, and Polynomial Optimization**

Session Title: New First-Order Methods for Convex/Nonconvex Optimization and Applications  
Organizer(s): Renbo Zhao, Robert Freund  
Chair(s): Renbo Zhao, Robert Freund  
Speaker #1: Dmitriy Drusvyatskiy, Learning in Decision-Dependent Games  
Speaker #2: Zikai Xiong, Using Taylor Approximated Gradients to Improve the Frank-Wolfe Method for Empirical Risk Minimization  
Speaker #3: Jim Renegar, Solving Convex Feasibility Problems

---

**Software**

Session Title: Power Network Optimization Software  
Organizer(s): Carleton Coffrin  
Chair(s): Carleton Coffrin  
Speaker #1: Jean-Paul Watson, EGRET: A Python-Based Library for Optimal Power Flow, Economic Dispatch, and Unit Commitment  
Speaker #2: Carleton Coffrin, Derivative Computations and AC Optimal Power Flow
**Parallel Sessions**

### Stochastic Algorithms

**Session Title:** First-Order Methods for Min-Max Problems  
**Organizer(s):** Yassine Laguel, N. Serhat Aybat, Mert Gurbuzbalaban  
**Chair(s):** Yassine Laguel, N. Serhat Aybat, Mert Gurbuzbalaban  
**Speaker #1:** Yassine Laguel, New Perspectives on Robustness via the Conditional Value at Risk  
**Speaker #2:** Bugra Can, A Variance-Reduced Stochastic Accelerated Primal Dual Algorithm  
**Speaker #3:** Mert Gurbuzbalaban, Robust Accelerated Primal-Dual Methods for Computing Saddle Points

### Stochastic Algorithms

**Session Title:** Recent Developments on Solving Minimax Optimization and Related Problems I  
**Organizer(s):** Ahmet Alacaoglu, Quoc Tran-Dinh  
**Chair(s):** Ahmet Alacaoglu  
**Speaker #1:** Qihang Lin, Federated Learning on Adaptively Weighted Nodes by Bilevel Optimization  
**Speaker #2:** Farzad Yousefian, Complexity Guarantees for an Implicit Smoothing-enabled Method for Stochastic MPECs  
**Speaker #3:** Siqi Zhang, The Complexity of Nonconvex-Strongly-Concave Minimax Optimization: Fundamental Limits and Improved Algorithms

### Variational Inequalities, Complementarity, Games, and Equilibria

**Session Title:** Networks and Games  
**Organizer(s):** Jianghai Hu  
**Chair(s):** Lina Mallozzi  
**Speaker #1:** Lina Mallozzi, Games and Optimal Transport in Practical Problems  
**Speaker #2:** Jan Harold Alcantara, Method of Alternating Projections for Solving Absolute Value Equations  
**Speaker #3:** Jasper Verbree, Effects of Demand on Wardrop Equilibrium and Breass’s Paradox

### Tuesday, 9:00am - 10:20am

### Applications of Continuous Optimization

**Session Title:** Continuous Optimization of Energy Systems  
**Organizer(s):** Anirudh Subramanyam  
**Chair(s):** Anirudh Subramanyam  
**Speaker #1:** Hassan Hijazi, To Project or Not to Project, That is the Question  
**Speaker #2:** Miguel Anjos, A Multinational Carbon-Credit Market Integrating Distinct National Carbon Allowance Strategies

### Derivative Free Optimization

**Session Title:** Stochastic Derivative-Free Optimization  
**Organizer(s):** Xin Chen, Jeffrey Larson  
**Chair(s):** Xin Chen, Jeffrey Larson  
**Speaker #1:** Damiano Zeffiro, A Weak Tail-Bound Probabilistic Condition for Function Estimation in Stochastic Derivative-Free Optimization  
**Speaker #2:** Krishnakumar Balasubramanian, Exploiting Structures in Stochastic Zeroth-order Optimization
Nonlinear Optimization
Session Title: Algorithms for Nonlinear Optimization II
Organizer(s): Johannes Brust, Elizabeth Wong
Chair(s): Johannes Brust, Elizabeth Wong
Speaker #1: Philip Gill, A Trust-Region Shifted Primal-Dual Interior Method for Nonlinear Optimization
Speaker #2: Minxin Zhang, A Projected-Search Interior Method for Nonlinear Optimization
Speaker #3: Elizabeth Wong, Second-Derivative SQP Methods for Nonlinear Optimization

Nonlinear Optimization
Session Title: High-Performance Computing in Nonlinear Optimization
Organizer(s): Nai-Yuan Chiang, Jingyi Wang
Chair(s): Jingyi Wang
Speaker #1: Jingyi Wang, An Optimization Algorithm for Nonsmooth Nonconvex Problems with Upper-$C^2$ Objective
Speaker #2: Sungho Shin, Graph-Structured Nonlinear Programming: Properties and Algorithms
Speaker #3: Michael Bynum, Advances in ParaPint for Efficient Decomposition of Structured Nonlinear Programming Problems

Nonlinear Optimization
Session Title: Stochastic Optimization Methods for Machine Learning I
Organizer(s): Youssef Diouane, El Houcine Bergou
Chair(s): Youssef Diouane, El Houcine Bergou
Speaker #1: Serge Gratton, Objective-Function-Free Optimization, Part II: Complexity of Adaptive Regularization and Numerical Experiments
Speaker #2: Simone Robegoldi, First-Order Subsampled Trust-Region Method with Inexact Restoration for Finite-Sum Minimization
Speaker #3: Vyacheslav Kungurtsev, Scaling the Wild: Decentralizing Hogwild!-style Shared-Memory SGD

Nonsmooth Optimization
Session Title: Advances in Nonsmooth Optimization: Theory and Applications I
Organizer(s): Johannes O. Royset
Chair(s): Johannes O. Royset
Speaker #1: Andrzej Ruszczynski, Subregular Recourse in Nonlinear Multistage Stochastic Optimization
Speaker #2: Johannes O. Royset, Consistent Approximations in Composite Optimization
Speaker #3: Ying Cui, A Decomposition Algorithm for Two-Stage Stochastic Programs with Nonconvex Recourse

Nonsmooth Optimization
Session Title: Nonsmooth Optimization: Contributed I
Chair(s): Liwei Jiang
Speaker #1: Liwei Jiang, Saddle Avoidance for Subgradient Methods
Speaker #2: Tam Le, Subgradient Sampling for Nonsmooth Nonconvex Minimization
Speaker #3: Cédric Josz, Lyapunov Stability of the Subgradient Method with Constant Step Size
<table>
<thead>
<tr>
<th>Session Title</th>
<th>Organizer(s)</th>
<th>Chair(s)</th>
<th>Speaker #1</th>
<th>Speaker #2</th>
<th>Speaker #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimization Under Uncertainty</td>
<td>Rauch 151</td>
<td>Chrysanthos Gounaris</td>
<td>Alexander Dowling, Optimization Under Epistemic Uncertainty with Bayesian Hybrid Models</td>
<td>Qi Zhang, Multistage Stochastic Programming for Capacity Planning with Uncertain Endogenous Technology Learning</td>
<td>Chrysanthos Gounaris, New Features and Benchmarking of the PyROS Solver</td>
</tr>
<tr>
<td>Optimization Under Uncertainty</td>
<td>Rauch 171</td>
<td>Omid Nohadani</td>
<td>Eojin Han, Scalable Dynamic Decision-Making via Nonparametric Liftings</td>
<td>Omid Nohadani, Dynamic Capacity Management for Deferred Surgeries</td>
<td>Jordi Castro, A New Specialized Interior-Point Method for Large-Scale Multistage Stochastic Optimization</td>
</tr>
<tr>
<td>Optimization Under Uncertainty</td>
<td>Rauch 141</td>
<td>Viet Anh Nguyen</td>
<td>Yutong Wu, Data-Driven Unit Commitment Problem under Uncertainty with Fairness Considerations</td>
<td>Napat Rujeerapaiboon, Mean-Variance Robust Inventory Model</td>
<td>Andrew Rosenberg, Methods for Ambiguity Set Estimation in Distributionally Robust Optimization</td>
</tr>
</tbody>
</table>
Parallel Sessions

PDE Constrained Optimization

**Session Title**: Algorithmic Advances in Applications of PDE Constrained Optimization II
**Organizer(s)**: Denis Ridzal, Drew P. Kouri, Harbir Antil
**Chair(s)**: Denis Ridzal, Drew P. Kouri, Harbir Antil
**Speaker #1**: Kelsey DiPietro, Optimization-based Methods for Solving the Monge-Ampère Equation
**Speaker #2**: Lucas Bouck, Projection Free Method For the Frank Oseen Model of Liquid Crystals

Semidefinite, Conic, and Polynomial Optimization

**Session Title**: Convex and Nonconvex Methods for Matrix Factorization Problems II
**Organizer(s)**: Mateo Díaz, Oscar Leong, Yong Sheng Soh
**Chair(s)**: Mateo Díaz, Oscar Leong, Yong Sheng Soh
**Speaker #1**: Justin Romberg, Approximate Low-Rank Recovery from Noisy and Local Measurements by Convex Programming
**Speaker #2**: Oscar Leong, On the Convex Dimension of Data
**Speaker #3**: Yong Sheng Soh, Learning Data Representations with Symmetries

Semidefinite, Conic, and Polynomial Optimization

**Session Title**: Polynomial Optimization I
**Organizer(s)**: Luis F. Zuluaga
**Chair(s)**: Luis F. Zuluaga
**Speaker #1**: Georgina Hall, Sums of Separable plus Quadratic Polynomials
**Speaker #2**: Dávid Papp, Dual Nonnegativity Certificates in Polynomial Optimization

Software

**Session Title**: Nonnegative Matrix Factorization: Models, Algorithms, and Applications
**Organizer(s)**: Nicolas Nadisic
**Chair(s)**: Nicolas Nadisic
**Speaker #1**: Nicolas Nadisic, Introduction to Nonnegative Matrix Factorization
**Speaker #2**: Hiroyuki Kasai, Introduction of NMFLibrary: An Open-Source Toolbox for Non-Negative Matrix Factorization (NMF)

Stochastic Algorithms

**Session Title**: Recent Developments on Solving Minimax Optimization and Related Problems II
**Organizer(s)**: Ahmet Alacaoglu, Quoc Tran-Dinh
**Chair(s)**: Ahmet Alacaoglu
**Speaker #1**: Wäiss Azizian, Last-Iterate Convergence Rates of Mirror Methods in Stochastic Variational Inequalities
**Speaker #2**: Rahul Parhi, Viewing Neural Network Training Problems as Optimization Problems over Banach Spaces

Variational Inequalities, Complementarity, Games, and Equilibria

**Session Title**: Games and Markets: Analysis and Applications
**Organizer(s)**: Andrew Liu
**Chair(s)**: Andrew Liu
**Speaker #1**: Andrew Liu, Market Equilibrium and Retail Rate Design in the Presence of Prosumers
**Speaker #2**: Didier Aussell, Multi-Leader-Follower Games: Theoretical Advances and to Applications
## Convexification and Global Optimization

Session Title: Convexification of Quadratic/Cubic Programs  
Organizer(s): Boshi Yang  
Chair(s): Boshi Yang  
Speaker #1: **Lucas Waddell**, Strengthening a Linear Reformulation of the 0-1 Cubic Knapsack Problem via Variable Reordering  
Speaker #2: **Boshi Yang**, Quadratic Programs with Non-intersecting Constraints  
Speaker #3: **Andres Gomez**, A Graph-Based Decomposition Method for Quadratic Optimization with Indicators

## Derivative Free Optimization

Session Title: Using Gradient Estimates in Derivative-Free Optimization  
Organizer(s): Sara Shashaani  
Chair(s): Sara Shashaani  
Speaker #1: **Junhui Zhang**, Distributionally Constrained Black-Box Stochastic Gradient Estimation and Optimization  
Speaker #2: **Geovani Nunes Grapiglia**, Quadratic Regularization Methods based on Finite-Difference Gradient Approximations  
Speaker #3: **Coralia Cartis**, Scalable Derivative-Free Methods

## Nonlinear Optimization

Session Title: Stochastic Optimization Methods for Machine Learning II  
Organizer(s): Aritra Dutta, El Houcine Bergou  
Chair(s): Aritra Dutta, El Houcine Bergou  
Speaker #1: **Hernando Ombao**, Separating Stimulus-Induced and Background Components of Dynamic Functional Connectivity  
Speaker #2: **Qiang Heng**, Bayesian Trend Filtering via Proximal Markov Chain Monte Carlo  
Speaker #3: **Srijan Das**, Multiple Modalities are All You for Video Understanding!

## Nonsmooth Optimization

Session Title: Geometry in Nonsmooth Optimization  
Organizer(s): Tonghua Tian  
Chair(s): Tonghua Tian  
Speaker #1: **Tonghua Tian**, Manifolds in Nonsmooth Optimization: Conservative Gradient Fields and Partial Smoothness  
Speaker #2: **Vasilis Charisopoulos**, A Superlinearly Convergent Subgradient Method for Sharp Semismooth Problems  
Speaker #3: **X.Y. Han**, Survey Descent: A Multipoint Generalization of Gradient Descent for Nonsmooth Optimization

## Optimization for Data Science and Machine Learning

Session Title: Complexity of Stochastic Optimization and Variational Inequalities  
Organizer(s): Cristobal Guzman  
Chair(s): Cristobal Guzman  
Speaker #1: **Xufeng Cai**, Stochastic Halpern Iteration with Variance Reduction for Stochastic Monotone Inclusions  
Speaker #2: **Yair Carmon**, Making SGD Parameter-Free
Parallel Sessions

Optimization for Data Science and Machine Learning

Session Title: Recent Advancements in Optimization Methods for Machine Learning III
Organizer(s): Nicolas Loizou, Sebastian Stich
Chair(s): Nicolas Loizou, Sebastian Stich
Speaker #1: Ahmet Alacaoglu, On the Complexity of a Practical Primal-Dual Coordinate Method
Speaker #2: Robert Gower, Cutting Some Slack for SGD with Adaptive Polyak Stepsizes
Speaker #3: Zheng Shi, AI-SARAH: Adaptive and Implicit Stochastic Recursive Gradient Methods

Optimization Under Uncertainty

Session Title: Advances in Reinforcement Learning
Organizer(s): Selvaprabu Nadarajah
Chair(s): Selvaprabu Nadarajah
Speaker #1: Yiheng Lin, Multi-Agent Reinforcement Learning in Time-Varying Networked Systems
Speaker #2: Selvaprabu Nadarajah, Self-adapting Network Relaxations for Weakly-Coupled Markov Decision Processes

Session Title: Advances in Stochastic Programming
Organizer(s): Can Li
Chair(s): Can Li
Speaker #1: Jim Luedtke, Sparse Multi-Term Disjunctive Cuts for the Epigraph of a Function of Binary Variables
Speaker #2: Joshua Pulsipher, Random Field Optimization
Speaker #3: Can Li, Piecewise Linear Decision Rules via Adaptive Partition for Two Stage Stochastic Mixed Integer Linear Programs

Session Title: Algorithms for Distributionally Robust Optimization
Organizer(s): Anirudh Subramanyam
Chair(s): Anirudh Subramanyam
Speaker #1: Sanjay Mehrotra, An Algorithm for Stochastic Convex-Concave Fractional Programs with Applications to Production Efficiency and Equitable Resource Allocation
Speaker #2: Zukui Li, Kernel Distributionally Robust Chance-Constrained Process Optimization
Speaker #3: Ran Ji, Decomposition Algorithm for Parallel Machine Scheduling Problem under Uncertain Sequence Dependent Setups

Session Title: Large-Scale Data-Driven Optimization
Organizer(s): Soroosh Shafieezadeh Abadeh
Chair(s): Soroosh Shafieezadeh Abadeh
Speaker #1: Jiajin Li, Nonsmooth Composite Nonconvex-Concave Minimax Optimization for Distributionally Robust Optimization
Speaker #2: Hongseok Namkoong, Off-Policy Policy Evaluation For Sequential Decisions Under Unobserved Confounding
Speaker #3: Soroosh Shafieezadeh Abadeh, Wasserstein Distance Between a Discrete Probability Measure Supported on Two Points and the Lebesgue
### PDE Constrained Optimization  
**Chandler-Ullmann 215**

**Session Title:** Optimization and Dynamics Based Deep Neural Networks  
**Organizer(s):** Akwum Onwunta, Deepanshu Verma  
**Chair(s):** Akwum Onwunta, Deepanshu Verma  
**Speaker #1:** Akwum Onwunta, A Deep Neural Network Approach for Solving Bayesian Inverse Problems Governed by PDEs  
**Speaker #2:** Deepanshu Verma, Advances and Challenges in Solving HJB Equations Arising in Stochastic Optimal Control  
**Speaker #3:** Randy Price, NINNs: Nudging Induced Neural Networks

### Semidefinite, Conic, and Polynomial Optimization  
**Rauch 261**

**Session Title:** Algorithms for Large-Scale Conic and Polynomial Optimization  
**Organizer(s):** James Saunderson  
**Chair(s):** Chenyang Yuan  
**Speaker #1:** Chenyang Yuan, Low-Rank Univariate Sum of Squares Has No Spurious Local Minima  
**Speaker #2:** Oisín Faust, Local Linear Convergence of Douglas-Rachford for Random Linear Programs

### Semidefinite, Conic, and Polynomial Optimization  
**Rauch 271**

**Session Title:** New Methods for Certain Structured Optimization Problems  
**Organizer(s):** Robert Freund, Renbo Zhao  
**Chair(s):** Robert Freund, Renbo Zhao  
**Speaker #1:** Damek Davis, A Nearly Linearly Convergent First-Order Method for Nonsmooth Functions with Quadratic Growth  
**Speaker #2:** Renbo Zhao, Multiplicative Gradient Method: When and Why It Works  
**Speaker #3:** Yurii Nesterov, Set-Limited Functions and Polynomial-Time Interior-Point Methods

### Software  
**Chandler-Ullmann 118**

**Session Title:** JuMP and Julia for Optimization  
**Organizer(s):** Joaquim Dias Garcia  
**Chair(s):** Joaquim Dias Garcia  
**Speaker #1:** Theo Diamandis, Faster Optimization using RandomizedPreconditioners.jl  
**Speaker #2:** Benoit Legat, Complex Numbers in JuMP  
**Speaker #3:** Joaquim Dias Garcia, Modeling Bilevel Optimization Problems with BilevelJuMP.jl

### Stochastic Algorithms  
**Chandler-Ullmann 133**

**Session Title:** Design and Analysis of Optimal Reinforcement Learning Algorithms I  
**Organizer(s):** Ashwin Pananjady  
**Chair(s):** Ashwin Pananjady  
**Speaker #1:** Tengyang Xie, Bellman-consistent Pessimism for Offline Reinforcement Learning  
**Speaker #2:** Wenlong Mou, Optimal Algorithms for Reinforcement Learning: Oracle Inequalities, Markov Chains, and Stochastic Approximation

### Stochastic Algorithms  
**Zoellner 143**

**Session Title:** Optimization Methods for Machine Learning  
**Organizer(s):** Saeed Ghadimi  
**Chair(s):** Saeed Ghadimi  
**Speaker #1:** Murat A. Erdogdu, Optimal Stochastic Convex Optimization under Infinite Noise Variance  
**Speaker #2:** Aritra Mitra, Fast, Communication-Efficient, and Robust Approaches for Large-Scale Machine Learning  
**Speaker #3:** Ilai Bistritz, Cooperative Multi-Player Bandit Optimization
Parallel Sessions

Variational Inequalities, Complementarity, Games, and Equilibria

Session Title: Hierarchical Optimization and Variational Inequality Problems
Organizer(s): Farzad Yousefian
Chair(s): Farzad Yousefian
Speaker #1: Peixuan Zhang, A Smoothed Augmented Lagrangian Framework for Stochastic Convex Optimization
Speaker #2: Harshal Kaushik, Optimization Problems with Variational Inequality Constraints: Algorithms, Complexity Analysis, and Applications

Variational Inequalities, Complementarity, Games, and Equilibria

Session Title: Saddle-Point and Bilevel Optimization
Organizer(s): Prashant Khanduri
Chair(s): Landi Zhu
Speaker #1: Landi Zhu, A Stochastic Subgradient Method for Distributionally Robust Non-Convex Learning
Speaker #2: Saif R. Kazi, A Hybrid Algorithm for Global Convergence of Mathematical Programming with Complementarity Constraints (MPCC)
Speaker #3: Alain Zemkoho, Semismooth Newton-type Methods for Bilevel Optimization

Tuesday, 1:40pm - 3:00pm

Applications of Continuous Optimization

Session Title: Advanced Formulations and Algorithms for Optimal Control and Dynamic Optimization
Organizer(s): Carl Laird
Chair(s): Lorenz Biegler
Speaker #1: Lorenz Biegler, Stable Economic Nonlinear Model Predictive Control without a Pre-Calculated Steady-State Optimum
Speaker #2: Mihai Anitescu, Decomposition with Overlap for Long Horizon Nonlinear Dynamic Programming

Convexification and Global Optimization

Session Title: Convexifications for Statistical Problems
Organizer(s): Andres Gomez
Chair(s): Andres Gomez
Speaker #1: Ryan Cory-Wright, A New Perspective on Low-Rank Optimization
Speaker #2: Shaoning Han, Compact Extended Formulation for Low-Rank Functions with Indicator Variables
Speaker #3: Linchuan Wei, On the Convex Hull of Convex Quadratic Optimization Problems with Indicators

Nonlinear Optimization

Session Title: Large-Scale, Nonlinear, and Stochastic Optimization I
Organizer(s): Albert S. Berahas
Chair(s): Albert S. Berahas
Speaker #1: Miaolan Xie, High Probability Iteration and Sample Complexity Bounds for Adaptive Line Search via Stochastic Oracles
Speaker #2: Salar Fattahi, Global Convergence of Sub-Gradient Method for Robust Matrix Recovery: Small Initialization, Noisy Measurements, and Over-Parameterization
Speaker #3: Vivak Patel, Convergence, Stability and Stopping of SGD for Nonconvex Objectives
Nonlinear Optimization  
Session Title: Linear Algebra Methods for Large-Scale Constrained Optimization  
Organizer(s): Michael Alan Saunders  
Chair(s): Michael Alan Saunders  
Speaker #1: Johannes Brust, Projected Linear Systems Solver (PLSS)  
Speaker #2: Shaked Regev, A Hybrid Direct-Iterative Method for Solving KKT Linear Systems  
Speaker #3: Alexis Montoison, Krylov Methods for Square Partitioned Linear Systems

Nonlinear Optimization  
Session Title: Sequential Optimality Conditions and Algorithms in Nonlinear Optimization  
Organizer(s): Paulo J. S. Silva  
Chair(s): Paulo J. S. Silva  
Speaker #1: Roberto Andreani, Improving the Global Convergence of Inexact Restoration Methods for Constrained Optimization Problems  

Nonsmooth Optimization  
Session Title: Recent Developments on Augmented Lagrangian-Based Methods for Nonsmooth Optimization  
Organizer(s): Kim-Chuan Toh  
Chair(s): Kim-Chuan Toh  
Speaker #1: Yangyang Xu, First-Order Methods for Problems with a Few Functional Constraints  
Speaker #2: Kim-Chuan Toh, A Two-Phase Proximal Augmented Lagrangian Method for High Dimensional Convex Quadratic Programming Problems  
Speaker #3: Vladimir Shikhman, Cardinality-constrained Optimization Problems in General Position and Beyond

Optimization for Data Science and Machine Learning  
Session Title: Machine Learning for Optimization  
Organizer(s): Bartolomeo Stellato  
Chair(s): Bartolomeo Stellato  
Speaker #1: Rajiv Sambharya, Learning to Convexify for Fast Real-Time Optimization  
Speaker #2: Vinit Ranjan, Performance Certification of First Order Methods for Parametric Quadratic Optimization  
Speaker #3: Cole Becker, Learning for robust optimization

Optimization Under Uncertainty  
Session Title: Advances in Robust Optimization Methodology  
Organizer(s): Nam Ho-Nguyen, Fatma Kilinc-Karzan  
Chair(s): Nam Ho-Nguyen  
Speaker #1: Anirudh Subramanyam, A Lagrangian Dual Method for Two-Stage Robust Optimization with Binary Uncertainties  
Speaker #2: Hyungki Im, Stochastic First-Order Methods for Constrained Distributionally Robust Optimization  
Speaker #3: Nan Jiang, DFO: A Robust Framework for Data-driven Decision-Making with Endogenous Outliers
Optimization Under Uncertainty
Session Title: Data-Driven Optimization I
Organizer(s): Tito Homem-de-Mello
Chair(s): Tito Homem-de-Mello
Speaker #1: Bernardo Pagnoncelli, Contextual Expected Value Constraints
Speaker #2: Yifan Lin, Bayesian Stochastic Gradient Descent for Stochastic Optimization with Streaming Input Data
Speaker #3: Rui Gao, Data-driven Multistage Distributionally Robust Optimization

Optimization Under Uncertainty
Session Title: Dynamic Optimization Under Uncertainty
Organizer(s): Grani A. Hanasusanto
Chair(s): Grani A. Hanasusanto
Speaker #1: Qing Jin, Distributionally Robust Optimization with Decision-Dependent Information Discovery
Speaker #2: Xiangyi Fan, A Decision Rule Approach for Two-Stage Data-Driven Distributionally Robust Optimization Problems with Random Recourse
Speaker #3: Shixuan Zhang, Dual Dynamic Programming for Data Driven Distributionally Robust Multi-stage Convex Optimization

Optimization Under Uncertainty
Session Title: Theory and Applications of Robust Optimization
Organizer(s): Angelos Georghiou
Chair(s): Angelos Georghiou
Speaker #1: Ke Ren, Inverse Optimization for Learning Feasible Regions
Speaker #2: Angelos Georghiou, Risk-averse Regret Minimization in Multi-Stage Stochastic Programs
Speaker #3: Ernest Quintana Aparicio, Robust Optimization of Uncertain Multiobjective Problems via Epigraphical Reformulations

PDE Constrained Optimization
Session Title: PDE Constrained Optimization with Nonsmooth Structures I
Organizer(s): Michael Hintermüller
Chair(s): Michael Hintermüller
Speaker #1: Caroline Geiersbach, Optimality Conditions and Regularization for Stochastic Optimization with Almost Sure State Constraints
Speaker #2: Patrick Jaap, An Inexact Proximal Newton Method for Energetic Finite Strain Plasticity Models
Speaker #3: Julius Lohmann, Dual Formulations of the Wasserstein Distance in Urban Planning

Semidefinite, Conic, and Polynomial Optimization
Session Title: Polynomial Optimization II
Organizer(s): Luis F. Zuluaga
Chair(s): Luis F. Zuluaga
Speaker #1: Abraar Chaudhry, Safely Learning Dynamical Systems with Conic Optimization
Speaker #2: João Gouveia, Slack Matrices and Self Duality
**Semidefinite, Conic, and Polynomial Optimization**  
Rauch 292

Session Title: Quantum IPMs for Conic Optimization  
Organizer(s): Brandon Augustino  
Chair(s): Brandon Augustino  
Speaker #1: Brandon Augustino, Solving the Semidefinite Relaxation of QUBOs in Matrix Multiplication Time, and Faster with Quantum  
Speaker #2: Mohammad Hossein Mohammadi Siahroudi, Iterative Refinement to Improve Precision and Complexity of Quantum Interior Point Methods  
Speaker #3: Tamás Terlaky, On Quantum Interior Point Methods for LO and SDO

---

**Semidefinite, Conic, and Polynomial Optimization**  
Rauch 261

Session Title: Riemannian Manifold Optimization and Conic Programming  
Organizer(s): Akiko Yoshise, Bruno F. Lourenço, Makoto Yamashita  
Chair(s): Masaru Ito  
Speaker #1: Masaru Ito, Automorphism Groups of the Derivative Relaxations of Rank One Generated Hyperbolicity Cones

---

**Software**  
Chandler-Ullmann 118

Session Title: Software for Optimisation on Manifolds  
Organizer(s): Ronny Bergmann, Jan Lellmann  
Chair(s): Ronny Bergmann  
Speaker #1: Ronny Bergmann, Manopt.jl — Numerical Optimisation on Manifolds in Julia  
Speaker #2: Willem Diepeveen, An Inexact Semismooth Newton Method on Riemannian Manifolds as an Extension to Manopt.jl

---

**Stochastic Algorithms**  
Zoellner 143

Session Title: On Accelerated Deterministic or Stochastic Optimization Methods I  
Organizer(s): Qihang Lin, Yangyang Xu  
Chair(s): Qihang Lin, Yangyang Xu  
Speaker #1: Yiming Ying, Stability and Generalization of Stochastic Gradient Methods  
Speaker #2: Saeed Ghadimi, Stochastic Multi-Level Composition Optimization Algorithms with Level-Independent Convergence Rates  
Speaker #3: Yao Yao, Large-Scale Optimization of Partial AUC in a Range of False Positive Rates

---

**Variational Inequalities, Complementarity, Games, and Equilibria**  
Chandler-Ullmann 218

Session Title: Multi-Agent Learning in Games  
Organizer(s): Kaiqing Zhang  
Chair(s): Kaiqing Zhang  
Speaker #1: Tianyi Lin, New Results on Multi-Agent Learning in Games  
Speaker #2: Runyu Zhang, On the Effect of Log-Barrier Regularization in Decentralized Softmax Gradient Play in Multiagent Systems
<table>
<thead>
<tr>
<th>Session Title</th>
<th>Organizer(s)</th>
<th>Chair(s)</th>
<th>Speaker #1</th>
<th>Speaker #2</th>
<th>Speaker #3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parallel Sessions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Derivative Free Optimization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session Title</td>
<td>Bayesian and Multiobjective Derivative-Free Optimization</td>
<td></td>
<td>Youssef Diouane, Bayesian Optimization: Performance Assessment and Improvements Based on Trust Regions</td>
<td>Ashwin Renganathan, Lookahead Bayesian Optimization and Applications to Multifidelity Optimization</td>
<td>Susan Hunter, On Constructing Confidence Sets for Multi-Objective Stochastic Optimization</td>
</tr>
<tr>
<td>Organizer(s)</td>
<td>Kwassi Joseph Dzahini, Sara Shashaani</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chair(s)</td>
<td>Kwassi Joseph Dzahini, Sara Shashaani</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker #1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker #2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker #3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nonlinear Optimization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizer(s)</td>
<td>Negar Soheili</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chair(s)</td>
<td>Negar Soheili</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker #1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker #2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker #3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nonlinear Optimization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizer(s)</td>
<td>Robert Baraldi</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chair(s)</td>
<td>Robert Baraldi</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker #1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker #2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker #3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nonlinear Optimization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session Title</td>
<td>Large-Scale, Nonlinear, and Stochastic Optimization II</td>
<td></td>
<td>Michal Dereziński, Hessian Averaging in Stochastic Newton Methods Achieves Superlinear Convergence</td>
<td>Jinwen Yang, Nearly Optimal Linear Convergence of Stochastic Primal-dual Methods for Linear Programming</td>
<td>Xin Li, Kaczmarz Algorithms for Tensors</td>
</tr>
<tr>
<td>Organizer(s)</td>
<td>Albert S. Berahas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chair(s)</td>
<td>Albert S. Berahas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker #1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker #2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker #3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nonsmooth Optimization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session Title</td>
<td>Advances in Nonsmooth Optimization: Theory and Applications II</td>
<td></td>
<td>Darinka Dentcheva, Multi-Stage Stochastic Optimization with Time-consistent Risk Constraints</td>
<td>Ariel Goodwin, The Maximum Entropy on the Mean Method for Linear Inverse Problems and Beyond</td>
<td>Meisam Razaviyayn, Nonconvex-Nonconcave Min-Max Optimization with a Small Maximization Domain</td>
</tr>
<tr>
<td>Organizer(s)</td>
<td>Johannes O. Royset</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chair(s)</td>
<td>Johannes O. Royset</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker #1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker #2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker #3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Parallel Sessions

Optimization for Data Science and Machine Learning

<table>
<thead>
<tr>
<th>Session Title</th>
<th>Chair(s)</th>
<th>Speaker #1</th>
<th>Speaker #2</th>
<th>Speaker #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimization for Data Science and Machine Learning: Contributed I</td>
<td>Xiaopeng Li</td>
<td>Xiaopeng Li, Certifying the Absence of Spurious Local Minima at Infinity</td>
<td>Tao Jiang, Certifying Clusters from Sum-of-Norms Clustering</td>
<td>Chong You, Robust Learning via Double Over-Parameterization</td>
</tr>
</tbody>
</table>

Optimization Under Uncertainty

<table>
<thead>
<tr>
<th>Session Title</th>
<th>Organizer(s)</th>
<th>Chair(s)</th>
<th>Speaker #1</th>
<th>Speaker #2</th>
<th>Speaker #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimal Transport for Data-Driven Decision Making</td>
<td>Soroosh Shafieezadeh Abadeh</td>
<td>Soroosh Shafieezadeh Abadeh</td>
<td>Nam Ho-Nguyen, Adversarial Classification via Distributional Robustness with Wasserstein Ambiguity</td>
<td>Haoming Shen, Convex Chance-Constrained Programs with Wasserstein Ambiguity</td>
<td>Liviu Aolaritei, Optimal Transport Based Distributionally Robust Optimization: Nash Equilibrium, Regularization, and Computation</td>
</tr>
</tbody>
</table>
### Semidefinite, Conic, and Polynomial Optimization

**Rauch 271**

**Session Title:** Approximation Hierarchies for Polynomial Optimization Problems II  
**Organizer(s):** Monique Laurent, Lucas Slot  
**Chair(s):** Lucas Slot  
**Speaker #1:** Adam Kurpisz, SoS Certification for Symmetric Quadratic Functions and its Connection to Constrained Boolean Hypercube Optimization  
**Speaker #2:** Liangzu Peng, Semidefinite Relaxations in Robust Rotation Search: Tight or Not

---

### Semidefinite, Conic, and Polynomial Optimization

**Rauch 261**

**Session Title:** Recent Advances in SDP II  
**Organizer(s):** Renata Sotirov  
**Chair(s):** Hao Hu  
**Speaker #1:** Hao Hu, Robust Interior Point Methods for Key Rate Computation in Quantum Key Distribution  
**Speaker #2:** Luis Felipe Vargas, Exact Sum of Squares Approximations for the Copositive Cone and Associated Bounds for the Stability Number of a Graph  
**Speaker #3:** Daniel Brosch, Moebius-Transformation-based Symmetry Reduction for Optimization in Binary Variables

---

### Software

**Chandler-Ullman 115**

**Session Title:** Learning and Performance Estimation for Large-Scale Optimization  
**Organizer(s):** Bartolomeo Stellato  
**Chair(s):** Bartolomeo Stellato  
**Speaker #1:** Maxime Gasse, Ecole: A Gym-like Library for Machine Learning in Combinatorial Optimization Solvers  
**Speaker #2:** Bartolomeo Stellato, Recent Advances in OSQP 1.0  
**Speaker #3:** Céline Moucer, PEPit: A Computer-Assisted Approach to Worst-Case Analysis of First-Order Optimization Methods and their Continuous Versions

---

### Software

**Chandler-Ullman 118**

**Session Title:** Scalable and Performance-Portable Optimization with Trilinos  
**Organizer(s):** Denis Ridzal  
**Chair(s):** Denis Ridzal  
**Speaker #1:** Aurya Javeed, Get ROL-ing  
**Speaker #2:** Roger Pawlowski, Sacado: Performance Portable Automatic Differentiation Tools for Next Generation Architectures  
**Speaker #3:** Mauro Perego, PDE-Constrained Optimization for Ice-Sheet Initialization

---

### Stochastic Algorithms

**Chandler-Ullman 133**

**Session Title:** Design and Analysis of Optimal Reinforcement Learning Algorithms II  
**Organizer(s):** Ashwin Pananjady  
**Chair(s):** Ashwin Pananjady  
**Speaker #1:** Shicong Cen, Fast Policy Optimization for Regularized Reinforcement Learning  
**Speaker #2:** Yan Li, Homotopic Policy Mirror Descent: Policy Convergence, Implicit Regularization, and Improved Sample Complexity
Parallel Sessions

Stochastic Algorithms
Session Title: On Accelerated Deterministic or Stochastic Optimization Methods II
Organizer(s): Qihang Lin, Yangyang Xu
Chair(s): Qihang Lin, Yangyang Xu
Speaker #1: Uday Shanbhag, Probability Maximization via Minkowski Functionals: Convex Representations and Tractable Resolution
Speaker #2: Kevin Tian, Acceleration via Primal-Dual Extragradient Methods
Speaker #3: Erfan Yazdandoost Hamedani, Randomized Block Coordinate Primal-Dual Methods for Saddle Point Problems

Variational Inequalities, Complementarity, Games, and Equilibria
Session Title: On Accelerated Deterministic or Stochastic Optimization Methods II
Organizer(s): Qihang Lin, Yangyang Xu
Chair(s): Qihang Lin, Yangyang Xu
Speaker #1: Uday Shanbhag, Probability Maximization via Minkowski Functionals: Convex Representations and Tractable Resolution
Speaker #2: Kevin Tian, Acceleration via Primal-Dual Extragradient Methods
Speaker #3: Erfan Yazdandoost Hamedani, Randomized Block Coordinate Primal-Dual Methods for Saddle Point Problems

Variational Inequalities, Complementarity, Games, and Equilibria
Session Title: Recent Advances in Hierarchical and PDE Constrained Optimization
Organizer(s): Harbir Antil, Evelyn Herberg, Uday V. Shanbhag
Chair(s): Harbir Antil, Evelyn Herberg, Uday V. Shanbhag
Speaker #1: Luke Marrinan, Randomized Smoothing Method for Constrained Minimization of Expectation-valued Lipschitz Continuous Functions
Speaker #2: Evelyn Herberg, Sketching for Nonsmooth PDE Constrained Optimization Problems
Speaker #3: Harbir Antil, A Proximal-Gradient-type Method for a Class of Nonconvex Nonsmooth Optimization Problems with Nonlocal Regularization

Variational Inequalities, Complementarity, Games, and Equilibria
Session Title: Recent Advances in Hierarchical and PDE Constrained Optimization
Organizer(s): Harbir Antil, Evelyn Herberg, Uday V. Shanbhag
Chair(s): Harbir Antil, Evelyn Herberg, Uday V. Shanbhag
Speaker #1: Luke Marrinan, Randomized Smoothing Method for Constrained Minimization of Expectation-valued Lipschitz Continuous Functions
Speaker #2: Evelyn Herberg, Sketching for Nonsmooth PDE Constrained Optimization Problems
Speaker #3: Harbir Antil, A Proximal-Gradient-type Method for a Class of Nonconvex Nonsmooth Optimization Problems with Nonlocal Regularization

Wednesday, 10:25am - 11:45am

Convexification and Global Optimization
Session Title: Convex Relaxations for MINLPs
Organizer(s): Aida Khajavirad
Chair(s): Aida Khajavirad
Speaker #1: Aida Khajavirad, Efficient Joint Object Matching via Linear Programming
Speaker #2: Ashish Chandra, Convex Approximations of Risk Measures with Applications to Chance-Constrained Programming
Speaker #3: William Strahl, On Constructing Quadratic Underestimators for Non-Convex D.C. Functions

Derivative Free Optimization
Session Title: Structure-Exploiting Derivative-Free Optimization
Organizer(s): Shima Dezfulian, Sara Shashaani
Chair(s): Shima Dezfulian, Sara Shashaani
Speaker #1: Matt Menickelly, Stochastic Average Model Methods
Speaker #2: Katya Scheinberg, Step Search: Adaptive Algorithms Based on Stochastic Oracles
Speaker #3: Matthew Hough, Model-Based Derivative-Free Methods for Convex-Constrained Optimization
### Nonlinear Optimization

**Session Title**: Advances in Nonlinear Optimization  
**Organizer(s)**: Baoyu Zhou  
**Chair(s)**: Baoyu Zhou  
**Speaker #1**: Baoyu Zhou, SQP Methods for Inequality Constrained Stochastic Optimization  
**Speaker #2**: Raghu Bollapragada, Adaptive Sampling Stochastic Sequential Quadratic Programming  
**Speaker #3**: Jiahao Shi, Accelerating Sequential Quadratic Programming for Equality Constrained Stochastic Optimization using Predictive Variance Reduction

### Nonlinear Optimization

**Session Title**: Stochastic Optimization Methods for Machine Learning III  
**Organizer(s)**: El Houcine Bergou, Youssef Diouane  
**Chair(s)**: El Houcine Bergou, Youssef Diouane  
**Speaker #1**: Luis Nunes Vicente, Stochastic Optimization of Multiple Objectives: A Critical Tool for Assessing Fairness in Machine Learning  
**Speaker #2**: Tommaso Giovannelli, Bilevel Stochastic Methods for Optimization and Machine Learning: Bilevel Stochastic Descent and DARTS  
**Speaker #3**: El Houcine Bergou, A Stochastic Levenberg-Marquardt Method using Random Models with Complexity Results

### Nonsmooth Optimization

**Session Title**: Nonsmooth Optimization in Machine Learning  
**Organizer(s)**: Ying Cui, Ju Sun  
**Chair(s)**: Ying Cui, Ju Sun  
**Speaker #1**: Claudia Sagastizabal, Fast Proximal Model-based Descent Methods  
**Speaker #2**: Ju Sun, Deep Learning with Constraints And Nonsmoothness  
**Speaker #3**: Fabian Schaipp, A Semismooth Newton Stochastic Proximal Point Algorithm with Variance Reduction

### Nonsmooth Optimization

**Session Title**: Projective Splitting Algorithms  
**Organizer(s)**: Jonathan Eckstein  
**Chair(s)**: Jonathan Eckstein  
**Speaker #1**: Jonathan Eckstein, Projective Hedging for Stochastic Programming  
**Speaker #2**: Patrick Johnstone, Stochastic Projective Splitting

### Optimization for Data Science and Machine Learning

**Session Title**: Adaptive Methods for Deep Learning  
**Organizer(s)**: Antonio Orvieto  
**Chair(s)**: Antonio Orvieto  
**Speaker #1**: Antonio Orvieto, Insight on the Dynamics of Adaptive Optimizers  
**Speaker #2**: Jinghui Chen, Optimization for Deep Learning with Adaptive Gradient Methods: New Perspectives
Optimization for Data Science and Machine Learning
Session Title: Decentralized Optimization for ML
Organizer(s): Hadrien Hendrikx
Chair(s): Gesualdo Scutari
Speaker #1: Gesualdo Scutari, High-Dimensional Inference over Networks: Linear Convergence and Statistical Guarantees
Speaker #2: Alexander Olshevsky, One-Shot Averaging in Distributed Optimization and Reinforcement Learning
Speaker #3: Hadrien Hendrikx, Beyond Spectral Gap: The Role of the Topology in Decentralized Learning

Optimization Under Uncertainty
Session Title: Data-Driven Decision-Making Under Uncertainty: Algorithms and Statistical Guarantees
Organizer(s): Tobias Sutter
Chair(s): Tobias Sutter
Speaker #1: Mengmeng Li, Offline Reinforcement Learning through Information Projection
Speaker #2: Irina Wang, Mean Robust Optimization
Speaker #3: Tobias Sutter, Robust Generalization despite Distribution Shift via Minimum Discriminating Information

Optimization Under Uncertainty
Session Title: Infinite-Dimensional Optimization
Organizer(s): Yiping Lu
Chair(s): Zhuoran Yang
Speaker #1: Zhuoran Yang, Wasserstein Flow Meets Replicator Dynamics: A Mean-Field Analysis of Representation Learning in Actor-Critic
Speaker #2: Sven Wang, Minimax Density Estimation via Measure Transport

Optimization Under Uncertainty
Session Title: Optimization Under Uncertain Extreme Events: Modeling and Applications
Organizer(s): Karthyek Murthy
Chair(s): Karthyek Murthy
Speaker #1: Zhenyuan Liu, Orthounimodal Distributionally Robust Optimization: Representation, Computation and Multivariate Extreme Event Applications
Speaker #2: Chang-Han Rhee, Eliminating Sharp Minima from SGD with Truncated Heavy-Tailed Noise
Speaker #3: Vishwas Rao, Optimization under Rare Chance Constraints

Optimization Under Uncertainty
Session Title: Theory and Applications in Stochastic and Robust Optimization
Organizer(s): Weijun Xie, Nan Jiang
Chair(s): Nan Jiang
Speaker #1: Akshit Goyal, Bilevel Optimization Model for Distribution Network with Uncertain Renewables and Flexible Loads under Wasserstein Metrics
Speaker #2: Nathan Justin, Optimal Robust Classification Trees
Speaker #3: Vassilis Digalakis, Jr., Towards Industrial Decarbonization via Robust Solar Capacity Expansion
Parallel Sessions

PDE Constrained Optimization
Session Title: PDE Constrained Optimization with Nonsmooth Structures II
Organizer(s): Michael Hintermüller
Chair(s): Michael Hintermüller
Speaker #1: Michael Hintermüller, Optimization Subject to Learning Informed PDEs
Speaker #2: Bastian Pötzi, Inexact Proximal Newton Methods in Hilbert Spaces

Semidefinite, Conic, and Polynomial Optimization
Session Title: Computational Advances in Semidefinite Programming: Algorithms and Limitations
Organizer(s): Georgina Hall, Alp Yurtsever
Chair(s): Georgina Hall, Alp Yurtsever
Speaker #1: Alp Yurtsever, Scalable Semidefinite Programming
Speaker #2: Jeffrey Zhang, Cubic Polynomials and Semidefinite Programming
Speaker #3: Ali Mohammad-Nezhad, On the Complexity of Analyticity in Semidefinite Optimization

Semidefinite, Conic, and Polynomial Optimization
Session Title: SDP Performance Estimation of Iterative Methods
Organizer(s): Etienne de Klerk
Chair(s): Etienne de Klerk
Speaker #1: Yoel Drori, On the Oracle Complexity of Smooth Strongly Convex Minimization
Speaker #2: Moslem Zamani, Linear Convergence of the Gradient Method Under the Polyak-Lojasiewicz Inequality for Hypoconvex Functions
Speaker #3: Hadi Abbaszadehpivasti, On the Rate of Convergence of the Difference-of-convex Algorithm (DCA)

Software
Session Title: Recent Advances in Commercial Solvers
Organizer(s): Robert Luce
Chair(s): Robert Luce
Speaker #1: Imre Polik, New Features in the Continuous Optimization Solvers of Xpress Solver Suite
Speaker #2: Robert Luce, Global Nonconvex Quadratic Optimization with Gurobi
Speaker #3: David M. Gay, Progress Report on Functions in AMPL

Stochastic Algorithms
Session Title: Understanding Randomization: Average-Case Efficiency of Iterative Algorithms
Organizer(s): Ashwin Pananjady
Chair(s): Ashwin Pananjady
Speaker #1: Damien Scieur, Only Tails Matter: Average-Case Universality and Robustness in the Convex Regime
Speaker #2: Kabir Chandrasekher, Sharp Global Convergence Guarantees for Iterative Nonconvex Optimization with Random Data
Parallel Sessions

Variational Inequalities, Complementarity, Games, and Equilibria
Chandler-Ullman 218
Session Title: Stochastic Variational Inequalities and Related Topics
Organizer(s): Jinglai Shen
Chair(s): Jinglai Shen
Speaker #1: Shisheng Cui, On the Computation of Equilibria in Monotone and Potential Stochastic Hierarchical Games
Speaker #2: Jinglai Shen, Dynamic Stochastic Variational Inequalities and Convergence of Discrete Approximation

Wednesday, 2:20pm - 3:40pm

Applications of Continuous Optimization
Chandler-Ullmann 116
Session Title: Optimization Problems with Optimal Transport
Organizer(s): Dirk Lorenz
Chair(s): Dirk Lorenz
Speaker #1: Hinrich Mahler, Regularization of the Beckmann Problem: Numerical Methods & Bilevel Applications
Speaker #2: Paul Manns, Γ-Convergence in Regularized Bilevel Optimal Transport
Speaker #3: Emanuele Naldi, Opial Property in Wasserstein Spaces and Applications

Derivative Free Optimization
Chandler-Ullmann 216
Session Title: Methods for Derivative-Free Optimization
Organizer(s): Krishnakumar Balasubramanian, Stefan Wild
Chair(s): Krishnakumar Balasubramanian, Stefan Wild
Speaker #1: Stephen Becker, Stochastic Subspace Descent
Speaker #2: Oumaima Sohab, Full-low Evaluation Methods for Derivative-free Optimization
Speaker #3: Wouter Jongeneel, Imaginary Zeroth-Order Optimization

Nonlinear Optimization
Rauch 201
Session Title: New Optimization Methods and Applications
Organizer(s): Hongchao Zhang, Yu-Hong Dai
Chair(s): Hongchao Zhang
Speaker #1: Rencang Li, Nonlinear Eigenvalue Approach for Optimization Problems on Stiefel Manifold from Machine Learning
Speaker #2: Zi Yang, The Multi-Objective Polynomial Optimization
Speaker #3: Suhan Zhong, Loss Functions for Finite Sets

Nonlinear Optimization
Rauch 241
Session Title: Nonlinear Optimization: Contributed I
Organizer(s): Qi Wang
Chair(s): Qi Wang
Speaker #1: Qi Wang, Worst-Case Complexity of TRACE with Inexact Subproblem Solutions for Nonconvex Smooth Optimization
Speaker #2: Vincent Roulet, Complexity Bounds of Iterative Linear Quadratic Algorithms for Discrete Time Nonlinear Control
Speaker #3: You Hui Goh, Minimizing the Number of Pieces for Piecewise Linear Approximation in Separable Concave Minimization
### Nonlinear Optimization

<table>
<thead>
<tr>
<th>Session Title</th>
<th>Organizer(s)</th>
<th>Chair(s)</th>
<th>Speaker #1</th>
<th>Speaker #2</th>
<th>Speaker #3</th>
</tr>
</thead>
</table>

### Nonsmooth Optimization

<table>
<thead>
<tr>
<th>Session Title</th>
<th>Organizer(s)</th>
<th>Chair(s)</th>
<th>Speaker #1</th>
<th>Speaker #2</th>
<th>Speaker #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonconvex Nonsmooth Optimization I</td>
<td>Mahdi Soltanolkotabi, Meisam Razaviyayn</td>
<td>Mahdi Soltanolkotabi, Meisam Razaviyayn</td>
<td>Mateo Diaz, Clustering a Mixture of Gaussians with Unknown Covariance</td>
<td>Mahdi Soltanolkotabi, Overparameterized Learning Beyond the Lazy Training Regime</td>
<td></td>
</tr>
</tbody>
</table>

### Optimization for Data Science and Machine Learning

<table>
<thead>
<tr>
<th>Session Title</th>
<th>Organizer(s)</th>
<th>Chair(s)</th>
<th>Speaker #1</th>
<th>Speaker #2</th>
<th>Speaker #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Results and Algorithms for Neural Networks and Imaging</td>
<td>Sammy Khalife</td>
<td>Sammy Khalife</td>
<td>Sammy Khalife, Structural Results and Algorithms for Linear Threshold Neural Networks</td>
<td>Phillip Kerger, Image Denoising with Quantum Annealing via Boltzmann Machines</td>
<td>Christian Kümmerle, Optimal Iteratively Reweighted Least Squares Algorithms for Low-Rank Optimization</td>
</tr>
<tr>
<td>Tensor Modeling and Optimization</td>
<td>Jamie Haddock, Liza Rebrova</td>
<td>Jamie Haddock</td>
<td>Jing Qin, Regularized Kaczmarz Algorithms for Tensor Recovery</td>
<td>Anna Ma, Recovery in the Tensor Regime</td>
<td>Longxiu Huang, Robust Tensor Decomposition</td>
</tr>
</tbody>
</table>
### Optimization Under Uncertainty

#### Rauch 151

**Session Title:** Distributional Robust Optimization  
**Organizer(s):** Bart Van Parys  
**Chair(s):** Bart Van Parys  
**Speaker #1:** Bart Van Parys, Optimal Data-Driven Optimization with Noisy Data  
**Speaker #2:** Mohammed Amine Bennouna, Holistic Robust Data-Driven Decisions  
**Speaker #3:** Karthyek Murthy, Debiasing “Plugged-in” Risk Estimates for Minimization of Extreme Risks with Limited Data

#### Rauch 141

**Session Title:** Topics in Stochastic Processes for Optimization  
**Organizer(s):** Anastasia Borovykh  
**Chair(s):** Anastasia Borovykh  
**Speaker #1:** Jing Dong, Stochastic Gradient Descent with Dependent Data for Offline Reinforcement Learning  
**Speaker #2:** Susana Gomes, Mean Field Limits and Phase Transitions for Multi-Well and Multi-Scale Diffusions  
**Speaker #3:** Daniel Lengyel, How Non-Orthogonal Finite-Difference Schemes are Optimal for Derivative-free Optimization

#### Rauch 171

**Session Title:** Uncertainty Quantification, Forecasting, and Model Aggregation  
**Organizer(s):** Houman Owhadi  
**Chair(s):** Pau Batlle-Franch  
**Speaker #1:** Pau Batlle Franch, Uncertainty Quantification of the 4th Kind: Optimal Posterior Accuracy-Uncertainty Tradeoff with the Minimum Enclosing Ball  
**Speaker #2:** Matthieu Darcy, One Short Learning of Stochastic Differential Equations with Computational Graph Completion  
**Speaker #3:** Hamed Hamze Bajgiran, Aggregation of Pareto Optimal Models

### PDE Constrained Optimization

#### Chandler-Ullmann 215

**Session Title:** Novel Approaches to PDE Constrained Shape Optimization  
**Organizer(s):** Volker Schulz  
**Chair(s):** Matthias Schuster  
**Speaker #1:** Matthias Schuster, Shape Optimization for Interface Identification in Nonlocal Model  
**Speaker #2:** Stephan Schmidt, Shape Newton Schemes Based on Material Derivative  
**Speaker #3:** Eddie Wadbro, Material Distribution Topology Optimization for an Acoustic Problem Including Visco-thermal Boundary Layer Losses

### Semidefinite, Conic, and Polynomial Optimization

#### Rauch 271

**Session Title:** Polynomial Optimization  
**Organizer(s):** Olga Kuryatnikova  
**Chair(s):** Lorenz Roebers  
**Speaker #1:** Lorenz Roebers, Sparse Non-SOS Putinar-type Positivstellensätze  
**Speaker #2:** Ken Kobayashi, Cardinality-constrained Distributionally Robust Portfolio Optimization
### Semidefinite, Conic, and Polynomial Optimization

**Session Title:** Recent Developments in Solving Structured Semidefinite Programs  
**Organizer(s):** Fatma Kilinc-Karzan, Alex L. Wang  
**Chair(s):** Alex L. Wang  
**Speaker #1:** Alex L. Wang, Untitled  
**Speaker #2:** Hank Yang, Solving Rank-One Semidefinite Relaxation of Polynomial Optimization: From Certifiable Robot Perception to Beyond  
**Speaker #3:** Swati Padmanabhan, A Faster Interior Point Method for Semidefinite Programming

### Software

**Session Title:** New Directions in Modeling Software  
**Organizer(s):** Steven Dirkse  
**Chair(s):** Steven Dirkse  
**Speaker #1:** Robert Fourer, Advances in Model-Based Optimization with AMPL  
**Speaker #2:** Utkarsh Detha, MOSEK v10: Affine Conic Constraints, New Conic Domains and Disjunctive Constraints  
**Speaker #3:** Steven Dirkse, Model Deployment with GAMS Engine

### Stochastic Algorithms

**Session Title:** Advances in Constrained Optimization and Stochastic Programming  
**Organizer(s):** Zhe Zhang  
**Chair(s):** Zhe Zhang  
**Speaker #1:** Zhe Zhang, An Optimal Algorithm for Convex Nested Stochastic Composite Optimization  
**Speaker #2:** Jiaming Liang, A Stochastic Proximal Bundle Method  
**Speaker #3:** Digvijay Boob, A (Stochastic) Level Constrained Gradient Descent Method for Nonconvex Function Constrained Optimization

### Variational Inequalities, Complementarity, Games, and Equilibria

**Session Title:** Reinforcement Learning for Multi-Agent Systems  
**Organizer(s):** Alfredo Garcia  
**Chair(s):** Alfredo Garcia  
**Speaker #1:** Sarper Aydin, A Decentralized Policy Gradient Algorithm for Markov Potential Games with Networked Agents  
**Speaker #2:** Siliang Zeng, Learning to Coordinate in Multi-Agent Systems: A Coordinated Actor-Critic Algorithm and Finite-Time Guarantees

### Thursday, 10:25am - 11:45am

### Applications of Continuous Optimization

**Session Title:** Algorithms and Computations in Federated Learning  
**Organizer(s):** Kibaek Kim  
**Chair(s):** Kibaek Kim  
**Speaker #1:** Minseok Ryu, Differentially Private Federated Learning via Inexact ADMM with Multiple Local Updates  
**Speaker #2:** Hideaki Nakao, Stability Constrained Optimization Using Neural Lyapunov Control
### Convexification and Global Optimization

**Session Title:** Global Optimization of MINLPs and its Applications  
**Organizer(s):** Harsha Nagarajan  
**Chair(s):** Harsha Nagarajan  
**Speaker #1:** Hamed Rahimian, Sequential Convexification of a Bilinear Set  
**Speaker #2:** Arvind Raghunathan, Optimal Linearizations for MultiLinear Programs (MLP)  
**Speaker #3:** David Bernal, Mixed-Binary Quadratic Programming via Convex Copositive Optimization and Ising Solvers

### Derivative Free Optimization

**Session Title:** Constrained Derivative-Free Optimization  
**Organizer(s):** Warren Hare, Stefan Wild  
**Chair(s):** Jeffrey Larson  
**Speaker #1:** Juliane Müller, Gaussian Processes for Accelerating Noisy VQE Optimization  
**Speaker #2:** Xin Chen, Leverage High-Pass and Low-Pass Filters to Improve Single-Point Zeroth-Order Optimization  
**Speaker #3:** Kwassi Joseph Dzahini, Constrained Stochastic Blackbox Optimization using a Progressive Barrier and Probabilistic Estimates

### Nonlinear Optimization

**Session Title:** Large-Scale, Nonlinear, and Stochastic Optimization III  
**Organizer(s):** Albert Berahas, Raghu Bollapragada  
**Chair(s):** Albert Berahas, Raghu Bollapragada  
**Speaker #1:** Andreas Waechter, A Smoothing-Based Decomposition Algorithm for Nonlinear Two-Stage Problems  
**Speaker #2:** Yuege (Gail) Xie, Linear Convergence of Adaptive Stochastic Gradient Descent Methods

**Session Title:** Set-Regularity and Error Bounds: Theory and Algorithms  
**Organizer(s):** Javier Pena, Angelia Nedich  
**Chair(s):** Javier Pena, Angelia Nedich  
**Speaker #1:** Luis Zuluaga, Linear Convergence of the Douglas-Rachford Algorithm via a Generic Error Bound Condition  
**Speaker #2:** David Gutman, The Inexact Cyclic Block Proximal Gradient Method and Inexact Proximal Maps  
**Speaker #3:** Angelia Nedich, Linear Regularity of Convex Sets

### Nonsmooth Optimization

**Session Title:** Nonconvex Nonsmooth Optimization II  
**Organizer(s):** Mahdi Soltanolkotabi, Meisam Razaviyayn  
**Chair(s):** Mahdi Soltanolkotabi, Meisam Razaviyayn  
**Speaker #1:** Anas Barakat, Stochastic Optimization with Momentum: Convergence, Fluctuations, and Traps Avoidance  
**Speaker #2:** Renato Monteiro, Global Complexity Bound of a Proximal ADMM for Linearly-Constrained Non-separable Nonconvex Composite Programming  
**Speaker #3:** Jiawei Zhang, Faster Algorithms and Improved Generalization Bounds for Nonconvex Minmax Optimization Problems
### Nonsmooth Optimization
Rauch 091

**Session Title:** Nonsmooth Optimization: Contributed II  
**Chair(s):** Tuyen Tran  
**Speaker #1:** Tuyen Tran, Minimizing Differences of Convex Functions with Applications to Multifacility Location and Clustering  
**Speaker #2:** Mikhail Solodov, Regularized Smoothing for Solution Mappings of Convex Problems, with Applications to Two-Stage Stochastic Programming and some Hierarchical Problems

### Optimization for Data Science and Machine Learning
Rauch 137

**Session Title:** Optimization for Data Science and Machine Learning: Contributed III  
**Chair(s):** Si Yi Meng  
**Speaker #1:** Si Yi Meng, Example Selection Methods for Stochastic Gradient Descent  
**Speaker #2:** Lena Sembach, Riemannian Optimization for Variance Estimation in Linear Mixed Models

### Optimization for Data Science and Machine Learning
Rauch 101

**Session Title:** Randomized Iterative Methods Beyond Least-Squares  
**Organizer(s):** Jamie Haddock, Liza Rebrova  
**Chair(s):** Jamie Haddock  
**Speaker #1:** Lionel Ngoupeyou Tondji, Faster Randomized Block Sparse Kaczmarz by Averaging  
**Speaker #2:** Maximilian Winkler, Extended Randomized Kaczmarz Method for Sparse Least Squares and Impulsive Noise Problems  
**Speaker #3:** William Swartworth, Iteratively Solving Corrupted Linear Systems

### Optimization Under Uncertainty
Rauch 151

**Session Title:** Data-Driven Optimization II  
**Organizer(s):** Tito Homem de Mello  
**Chair(s):** Tito Homem de Mello  
**Speaker #1:** Fengpei Li, General Feasibility Bounds for Sample Average Approximation via Vapnik-Chervonenkis Dimension  
**Speaker #2:** Tito Homem de Mello, Application-Driven Learning via Joint Estimation and Optimization

### Optimization Under Uncertainty
Rauch 184

**Session Title:** Recent Advances in Distributionally Robust Optimization  
**Organizer(s):** Jiajin Li  
**Chair(s):** Jiajin Li  
**Speaker #1:** Shengyi He, Higher-Order Expansion and Bartlett Correctability of Distributionally Robust Optimization  
**Speaker #2:** Jie Wang, Sinkhorn Distributionally Robust Optimization

### Optimization Under Uncertainty
Rauch 171

**Session Title:** Recent Advances in Optimization Under Uncertainty  
**Organizer(s):** Soroosh Shafieezadeh Abadeh  
**Chair(s):** Soroosh Shafieezadeh Abadeh  
**Speaker #1:** Yiling Zhang, Distributionally Robust Stochastic Bilevel Linear Programs with Facility Location Applications  
**Speaker #2:** Anand Deo, Risk Averse Decision Making Using Tail Self-Similarity  
**Speaker #3:** Man Yiu Tsang, An Inexact Column-and-Constraint Generation Method to Solve Two-Stage Robust Optimization Problems
### Optimization Under Uncertainty
Rauch 141

**Session Title:** Robust and Stochastic Combinatorial Optimization  
**Organizer(s):** Omar El Housni  
**Chair(s):** Omar El Housni  
**Speaker #1:** Rohan Ghuge, Batched Dueling Bandits  
**Speaker #2:** Omar El Housni, On the Power of Static Assignment Policies for Robust Facility Location Problems

### Semidefinite, Conic, and Polynomial Optimization
Rauch 261

**Session Title:** Quantum Computing Optimization  
**Organizer(s):** Ramin Fakhimi  
**Chair(s):** Ramin Fakhimi  
**Speaker #1:** Rodolfo Alexander Quintero Ospina, Characterizing and Benchmarking QUBO Reformulations of the Knapsack Problem  
**Speaker #2:** Ramin Fakhimi, Formulations of the Max k-Cut Problem on Classical and Quantum Computers

### Semidefinite, Conic, and Polynomial Optimization
Rauch 271

**Session Title:** Semidefinite Programming and Polynomials I  
**Organizer(s):** Greg Blekherman  
**Chair(s):** Greg Blekherman  
**Speaker #1:** Greg Blekherman, Complexity of Symmetric Nonnegative Polynomials  
**Speaker #2:** Julia Lindberg, The Maximum Likelihood Degree of Sparse Polynomial Systems  
**Speaker #3:** Bachir El Khadir, On Sum of Squares Representation of Convex Forms and Generalized Cauchy-Schwarz Inequalities

### Software
Chandler-Ullmann 118

**Session Title:** Computational Advances in Semidefinite Programming: Software and Applications  
**Organizer(s):** Alp Yurtsever, Georgina Hall  
**Chair(s):** Alp Yurtsever, Georgina Hall  
**Speaker #1:** Cameron Wolfe, How Much Pre-Training is Enough to Discover a Good Subnetwork?  
**Speaker #2:** Baptiste Goujaud, PEPit: A Python Framework for Performance Estimation

### Stochastic Algorithms
Chandler-Ullmann 133

**Session Title:** Frontiers of Stochastic Optimization  
**Organizer(s):** Tianyi Lin  
**Chair(s):** Tianyi Lin  
**Speaker #1:** Kaiqing Zhang, Optimistic Natural Policy Gradient for Multi-Agent Learning with Parameter Convergence and Function Approximation  
**Speaker #2:** Lin Xiao, Stochastic Optimization with Decision-Dependent Distributions  
**Speaker #3:** Getachew Befekadu, Rare-Event Simulations for Diffusion Processes Pertaining to a Chain of Distributed Systems with Small Random Perturbations

### Stochastic Algorithms
Zoellner 143

**Session Title:** New Theory and Applications in Dynamic Optimization  
**Organizer(s):** Peter Zhang  
**Chair(s):** Peter Zhang  
**Speaker #1:** Mohamed Yahya Soali, Minkowski Centers via Robust Optimization: Computation and Applications  
**Speaker #2:** Ningji Wei, Adjustability in Robust Linear Optimization  
**Speaker #3:** Kimberly Villalobos Carballo, A Robust Optimization Approach to Deep Learning
Thursday, 1:10pm - 2:30pm

Nonlinear Optimization
Session Title: Large-Scale, Nonlinear, and Stochastic Optimization IV
Organizer(s): Albert S. Berahas, Baoyu Zhou
Chair(s): Albert S. Berahas, Baoyu Zhou
Speaker #1: Tom O’Leary-Roseberry, Addressing Stability in Second Order Stochastic Methods
Speaker #2: Junhyung (Lyle) Kim, Convergence and Stability of the Stochastic Proximal Point Algorithm with Momentum
Speaker #3: Peng Wang, Linear Convergence of a Proximal Alternating Minimization Method with Extrapolation for L1-Norm Principal Component Analysis

Nonlinear Optimization
Session Title: Methods for Meta-Parameter Estimation in Complex Nonlinear Models
Organizer(s): Aleksandr Aravkin
Chair(s): Kevin Doherty
Speaker #1: Kevin Doherty, Derivative Free Optimization with Interpolation and Trust Regions: Efficient Use of Zeroth Order Information
Speaker #2: Aleksei Sholokhov, A Relaxation Approach to Feature Selection for Linear Mixed Effects Models
Speaker #3: Kelsey Maass, A Hyperparameter-Tuning Approach to Automated Radiotherapy Inverse Planning

Nonlinear Optimization
Session Title: Nonlinear Optimization: Contributed II
Organizer(s): Casey Garner
Chair(s): Casey Garner
Speaker #1: Casey Garner, Linearly Convergent FISTA Variant for Composite Optimization with Duality
Speaker #2: François Pacaud, Reduced-Space Interior-Point Method: A GPU-accelerated Comeback
Speaker #3: Naoki Marumo, Accelerated-Gradient-based Generalized Levenberg-Marquardt Method with Oracle Complexity Bound and Local Quadratic Convergence

Nonsmooth Optimization
Session Title: Recent Advances on Distributed Optimization
Organizer(s): Jingwei Liang, Mingrui Liu
Chair(s): Ying Sun
Speaker #1: Ying Sun, High-Dimensional Inference over Networks under Sparsity
Speaker #2: Zhize Li, Distributed Optimization with Communication Compression
Speaker #3: Ya-Nan Zhu, A Federated Primal Dual Fixed Point Method for Linearly Constrained Separable Optimization
### Optimization for Data Science and Machine Learning: Contributed IV

#### Session Title
Optimization for Data Science and Machine Learning: Contributed IV

#### Chair(s)
Elnur Gasanov

#### Speaker #1
**Elnur Gasanov**
*3PC: Three Point Compressors for Communication-Efficient Distributed Training and a Better Theory for Lazy Aggregation*

#### Speaker #2
**M. Taha Toghani**
*PARS-Push: Personalized, Asynchronous and Robust Decentralized Optimization*

#### Speaker #3
**Maximilian Würschmidt**
*Convergence Rates for a Deep Learning Algorithm for Semilinear PDEs*

---

### Optimization for Data Science and Machine Learning: Contributed V

#### Session Title
Optimization for Data Science and Machine Learning: Contributed V

#### Chair(s)
Ilyas Fatkhullin

#### Speaker #1
**Ilyas Fatkhullin**
*EF21 with Bells & Whistles: Practical Algorithmic Extensions of Modern Error Feedback*

#### Speaker #2
**Igor Sokolov**
*EF21: A New, Simpler, Theoretically Better, and Practically Faster Error Feedback*

---

### Optimization Under Uncertainty

#### Session Title
Advances in Large-Scale Sequential Decision Making

#### Organizer(s)
Selvaprabu Nadarajah

#### Chair(s)
Selvaprabu Nadarajah

#### Speaker #1
**Parshan Pakiman**
*Self-guided Approximate Linear Programs*

#### Speaker #2
**Sebastian Perez-Salazar**
*Robust Online Selection with Uncertain Offer Acceptance*

#### Speaker #3
**Cagin Uru**
*Sequential Search with Acquisition Uncertainty*

---

### Optimization Under Uncertainty

#### Session Title
Multistage Stochastic/Robust Optimization

#### Organizer(s)
Siqian Shen, Xian Yu

#### Chair(s)
Xian Yu

#### Speaker #1
**Rohit Kannan**
*Data-Driven Multi-Stage Stochastic Optimization on Time Series*

#### Speaker #2
**Kibaek Kim**
*A Reinforcement Learning Approach to Parameter Selection for Distributed Optimization in Power Systems*

#### Speaker #3
**Xian Yu**
*On the Value of Multistage Risk-Averse Stochastic Facility Location with or without Prioritization*

---

### Optimization Under Uncertainty

#### Session Title
Online Learning and Robustness in Online Control

#### Organizer(s)
Varun Gupta

#### Chair(s)
Varun Gupta

#### Speaker #1
**Gautam Goel**
*Online Control with Optimal Data-Dependent Regret*

#### Speaker #2
**Shuo Han**
*Accelerating Model-Free Policy Optimization Using Model-Based Gradient*

#### Speaker #3
**Hao Wang**
*A Non-Asymptotic Analysis for Re-Solving Heuristic in Online Matching*
### Optimization Under Uncertainty

**Session Title:** Optimization Under Uncertainty for Machine Learning  
**Organizer(s):** Bahar Taskesen  
**Chair(s):** Bahar Taskesen  
**Speaker #1:** Bahar Taskesen, Sequential Domain Adaptation by Synthesizing Distributionally Robust Experts  
**Speaker #2:** Yves Rychener, Distributionally Robust Optimization with Multiple Data Sources  
**Speaker #3:** Karthik Natarajan, Generalizing Correlation Gap to Pairwise Independence

### PDE Constrained Optimization

**Session Title:** Optimization for Flow-Transport Systems  
**Organizer(s):** Carlos N. Rautenberg, Weiwei Hu  
**Chair(s):** Carlos N. Rautenberg  
**Speaker #1:** Lin Mu, Pressure Robust Scheme for Incompressible Flow  
**Speaker #2:** Lorena Bociu, Analysis and Control in Fluid Flows through Deformable Porous Media

### Semidefinite, Conic, and Polynomial Optimization

**Session Title:** Polynomial Optimization: Theory and Application to Nonlinear Systems and PDEs II  
**Organizer(s):** Victor Magron  
**Chair(s):** Philipp di Dio  
**Speaker #1:** Philipp di Dio, Time-dependent Moments from PDEs  
**Speaker #2:** Felix Kirschner, Construction of Multivariate Polynomial Approximation Kernels via Semidefinite Programming  
**Speaker #3:** Alexander Taveira Blomenhofer, Projecting Towards the Image Set of a Polynomial Map with Sum-of-Squares Relaxations

### Semidefinite, Conic, and Polynomial Optimization

**Session Title:** Semidefinite Programming and Polynomials II  
**Organizer(s):** Greg Blekherman  
**Chair(s):** Greg Blekherman  
**Speaker #1:** Gabor Pataki, How Do Exponential Size Solutions Arise in Semidefinite Programming?  
**Speaker #2:** Shengding Sun, A Novel Perspective of Classical Linear Algebra using Hyperbolic Polynomials  
**Speaker #3:** Jiawang Nie, Generalized Nash Equilibrium Problems

### Semidefinite, Conic, and Polynomial Optimization

**Session Title:** Semidefinite, Conic, and Polynomial Optimization: Contributed  
**Chair(s):** Frank Permenter  
**Speaker #1:** Frank Permenter, Log-Domain Interior-Point Methods for Quadratic Programming  
**Speaker #2:** Shuvomoy Das Gupta, Branch-and-Bound Performance Estimation Programming: A Unified Methodology for Constructing Optimal Optimization Methods

### Software

**Session Title:** Computational Science and Engineering Applications of Automatic Differentiation and Optimization  
**Organizer(s):** Paul Hovland  
**Chair(s):** Rebecca Gjini  
**Speaker #1:** Rebecca Gjini, Automatic Differentiation and Optimization in a Pythonic Direct Data Assimilation Framework for Wind Retrievals  
**Speaker #2:** Sri Hari Krishna Narayanan, Reducing Memory Requirements of Quantum Optimal Control  
**Speaker #3:** Ludger Paehler, Compiler-enabled Gradient-based Optimization of Shock-Bubble Interactions
<table>
<thead>
<tr>
<th>Session Title</th>
<th>Organizer(s)</th>
<th>Chair(s)</th>
<th>Speaker #1</th>
<th>Speaker #2</th>
<th>Speaker #3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variational Inequalities, Complementarity, Games, and Equilibria</strong></td>
<td>Ceyhun Eksin</td>
<td></td>
<td><strong>Duong Thuy Anh (Ella) Nguyen</strong>, Distributed Nash Equilibrium Seeking over Time-Varying Directed Communication Networks</td>
<td><strong>Alfredo Garcia</strong>, A Market Mechanism for Trading Flexibility Between Interconnected Electricity Markets</td>
<td><strong>James Bailey</strong>, $O(1/T)$ Time-Average Convergence in a Generalization of Multiagent Zero-Sum Games</td>
</tr>
</tbody>
</table>
AIMMS/MOPTA Modeling Competition

The 14th AIMMS-MOPTA Optimization Modeling Competition is a result of cooperation between AIMMS and the organizers of the MOPTA conference. Teams of at most three students participated and solved a challenging surgery scheduling in flexible operating rooms under uncertainty problem. The teams had to form a mathematical model of the problem, implement it in a modeling language such as AIMMS, solve it, create a graphical user interface, and write a 15-page report on the project. For more information about the competition and the full problem description, please see https://iccopt2022.lehigh.edu/competition-and-prizes/aimms-mopta-competition/.

Problem: Surgery Scheduling in Flexible Operating Rooms Under Uncertainty

Hospitals are complex and expensive systems to manage. One department of particular interest that poses major managerial challenges is the operating room (OR) department. The OR department generates about 40–70% of revenues and incurs 20–40% of operating costs in a hospital. It also demands significant hospital resources and directly influences patient flow and efficiency of care delivery. Thus, hospital managers are constantly seeking better OR and surgery scheduling approaches to improve OR utilization, surgical care, and quality, as well as to minimize operational costs.

Stochasticity is an intrinsic characteristic of OR and surgery scheduling problems since surgical activities are subject to multiple sources of uncertainty. This competition focuses on an elective surgery planning problem (ESP) in flexible ORs, where emergency patients are accommodated in the existing elective surgery schedule. Elective cases can be scheduled weeks or months in advance. In contrast, the arrival of emergency surgeries is random, and must be performed on the day of arrival. The goal is to construct a plan that specifies the assignments of a subset of elective cases from a waiting list to available OR surgery blocks and the scheduled start times of surgeries assigned to each block. The surgical blocks are typically designed to allow for multiple surgeries to be scheduled during the surgery block’s time length. The plan’s quality is a function of costs related to performing or postponing elective surgeries, costs related to OR overtime and idle time, costs related to surgery waiting times, and costs related to canceling scheduled surgeries to accommodate emergency surgeries. The goal is to develop an efficient and implementable method to solve ESP that managers can use in practice.

Finalists

We are happy that eight teams from around the world registered for the competition. The panel of first-round judges were Linlin Ma (Supply Chain Application Developer, AIMMS), Karmel S. Shehadeh (ISE/Lehigh), and Luis Zuluaga (ISE/Lehigh) who selected the following three teams as finalists:

Bern Unicorns’s, University of Bern, Department of Business Administration

**Team Members:** Robin Hauenstein, Nicklas Klein, Nicola Travaglini  
**Advisor:** Norbert Trautmann

The HospITAls, University of Pavia, Department of Mathematics “Felice Casorati”

**Team Members:** Ambrogio Maria Bernardelli, Lorenzo Bonasera, Eleonora Vercesi  
**Advisor:** Davide Duma

TU Berlin, TU Berlin, Institute for Mathematics

**Team Members:** Mohammed Majthoub Almoghrabi, Przemyslaw Bartman  
**Advisor:** Guillaume Sagnol

Each finalist will give a 26-minute presentation (20 minutes for the talk and 6 minutes for questions) on their work during the 14th AIMMS-MOPTA Optimization Modeling Competition session on July 26, 2022, starting at 5pm in the Perella Auditorium (Rauch 184). The winning team will be announced at the conference dinner (Prizes: 1st place $1200; 2nd place $600; 3rd place $300). In addition, the highest-ranked finalist team that used AIMMS as the software platform to solve the problem will be awarded an additional $1000. The panel of judges will consist of the following: Ana-Iulia Alexandrescu-Ansley (ISE/Lehigh), Linlin Ma (Supply Chain Application Developer, AIMMS), Daniel P. Robinson (ISE/Lehigh), Karmel S. Shehadeh (ISE/Lehigh), and Luis Zuluaga (ISE/Lehigh).

We thank all the teams for contributing to the competition. This was another successful and positive experience for all participants and MOPTA organizers. Thank you to AIMMS for sponsoring the competition!
Best Paper Session

The Best Paper Prize for Young Researchers in Continuous Optimization has been led by the Selection Committee:

- Katya Scheinberg (Chair), Cornell University
- Miguel Anjos, University of Edinburgh
- Johannes Royset, Naval Postgraduate School
- Suvrit Sra, Massachusetts Institute

Four finalists will be featured in a dedicated session that will take place on July 25, 2022 from 4:40-6pm in Baker Hall (Zoellner Arts Center). The winner will be determined after the finalist session and announced at the conference dinner.

1. **Nominee:** Kabir Aladin Chandrasekher, Ashwin Pananjady, and Christos Thrampoulidis (co-finalists)
   
   **Title:** Sharp global convergence guarantees for iterative nonconvex optimization with random data
   
   **Abstract:** Iterative algorithms are the workhorses of modern statistical learning, and are widely used to fit large-scale, complex models to random data. While the choice of an algorithm and its hyperparameters determines both the speed and fidelity of the learning pipeline, it is common for this choice to be made heuristically, either by expensive trial-and-error or by comparing rough bounds on convergence rates of various candidate algorithms. Motivated by this, we develop a principled framework that produces sharp, iterate-by-iterate characterizations of solution quality for algorithms run with sample-splitting on a wide range of nonconvex model-fitting problems with Gaussian data. I will present the general framework and highlight several concrete consequences for parameter estimation in some popular statistical models, covering both higher-order algorithms based on alternating updates as well as first-order algorithms based on subgradient descent. These corollaries reveal multiple nonstandard phenomena and facilitate rigorous comparisons between algorithms.

2. **Nominee:** Christopher Criscitiello
   
   **Title:** Negative curvature obstructs acceleration for geodesically convex optimization, even with exact first-order oracles
   
   **Abstract:** Hamilton and Moitra (2021) showed that, in certain regimes, it is not possible to accelerate Riemannian gradient descent in the hyperbolic plane if we restrict ourselves to algorithms which make queries in a (large) bounded domain and which receive gradients and function values corrupted by a (small) amount of noise. We show that acceleration remains unachievable for any deterministic algorithm which receives exact gradient and function-value information (unbounded queries, no noise). Our results hold for the classes of strongly and nonstrongly geodesically convex functions, and for a large class of Hadamard manifolds including hyperbolic spaces and the symmetric space $\text{SL}(n)/\text{SO}(n)$ of positive definite $n \times n$ matrices of determinant one. This cements a surprising gap between the complexity of convex optimization and geodesically convex optimization: for hyperbolic spaces, Riemannian gradient descent is optimal on the class of smooth and and strongly geodesically convex functions, in the regime where the condition number scales with the radius of the optimization domain. The key idea for proving the lower bound consists of perturbing the hard functions of Hamilton and Moitra (2021) with sums of bump functions chosen by a resisting oracle.

3. **Nominee:** X.Y. Han
   
   **Title:** Survey Descent: A Multipoint Generalization of Gradient Descent for Nonsmooth Optimization
   
   **Abstract:** For strongly convex objectives that are smooth, the classical theory of gradient descent ensures linear convergence relative to the number of gradient evaluations. An analogous nonsmooth theory is challenging: even when the objective is smooth at every iterate, the corresponding local models are unstable, and traditional remedies need unpredictably many cutting planes. We instead propose a multipoint generalization of the gradient descent iteration for local optimization. While designed with general objectives in mind, we are motivated by a “max-of-smooth” model that captures the subdifferential dimension at optimality. We prove linear convergence when the objective is itself max-of-smooth, and experiments suggest a more general phenomenon.

4. **Nominee:** Shanyin Tong
   
   **Title:** Optimization under rare chance constraints
   
   **Abstract:** Chance constraints provide a principled framework to mitigate the risk of high-impact extreme events by modifying the controllable properties of a system. The low probability and rare occurrence of such events, however, impose severe sampling and computational requirements on classical solution methods that render them impractical. This work proposes a novel sampling-free method for solving rare chance constrained optimization problems affected by uncertainties that follow general Gaussian mixture distributions. By integrating modern developments in large deviation theory with tools from convex analysis and bilevel optimization, we propose tractable formulations that can be solved by off-the-shelf solvers. Our formulations enjoy several advantages compared to classical methods: their size and complexity is independent of event rarity, they do not require linearity or convexity assumptions on system constraints, and under easily verifiable conditions, serve as safe conservative approximations or asymptotically exact reformulations of the true problem. Computational experiments on linear, nonlinear, and PDE-constrained problems from applications in portfolio management, structural engineering, and fluid dynamics illustrate the broad applicability of our method and its advantages over classical sampling-based approaches in terms of both accuracy and efficiency.
The poster session and competition will be held on Monday, July 25 from 6-8pm in the Rauch atrium. The list of poster session presenters is below; for full abstracts, see here. The best poster prize will be awarded at the conference dinner.

**Bugra Can**
*A Variance-reduced Stochastic Accelerated Primal Dual Algorithm*

**Sebastien Colla**
*Automatic Performance Estimation for Decentralized Optimization*

**Nicole Cortes**
*Co-optimizing the Design and Operation strategy of solid oxide fuel cell-based hydrogen-electricity co-production systems*

**Niloofar Fadavi**
*An active-set method for two-stage stochastic quadratic programming*

**Jun-ya Gotoh**
*Knot Selection of B-Spline Regression via Trimmed Regularizer*

**Fadi Hamad**
*A fully adaptive trust-region method*

**Yao Ji**
*Distributed Sparse Regression via Penalization*

**David Kiessling**
*Efficient Numerical Algorithms for Time Optimal Control*

**J. Lyle Kim**
*Convergence and Stability of the Stochastic Proximal Point Algorithm with Momentum*

**Clement Lezane**
*Algorithms for Stochastic Complementary Composite Minimization*

**Yongchun Li**
*D-optimal Data Fusion: Exact and Approximation Algorithms*

**Xinhong Liu**
*Optimization of Reactive Ink Formulation for Additive Manufacturing of Charged Membranes*

**Si Yi Meng**
*Reusing function evaluations in derivative-free line search methods*

**Wenlong Mou**
*ROOT-SGD: Sharp Nonasymptotics and Asymptotic Efficiency in a Single Algorithm*

**Edward Duc Hien Nguyen**
*Exact Diffusion with Local Steps*

**Vincent Roulet**
*Complexity Bounds of Iterative Linear Quadratic Optimization Algorithms for Discrete Time Nonlinear Control*

**Pouya Sampourmahani**
*On the Semidefinite Representation of Second-order Conic Optimization Problems*

**Igor Sokolov**
*EF21: A New, Simpler, Theoretically Better, and Practically Faster Error Feedback*
<table>
<thead>
<tr>
<th>Poster</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trang Tran</td>
<td><em>Policy Optimization for Queueing Models</em></td>
<td>19</td>
</tr>
<tr>
<td>Jie Wang</td>
<td><em>Sinkhorn Distributionally Robust Optimization</em></td>
<td>20</td>
</tr>
<tr>
<td>Ke Wang</td>
<td><em>Bayesian Optimization Considering Experimental and Physical Constraints – Case Study of Flash Sintering</em></td>
<td>21</td>
</tr>
<tr>
<td>Qi Wang</td>
<td><em>Worst-Case Complexity of TRACE with Inexact Subproblem Solutions for Nonconvex Smooth Optimization</em></td>
<td>22</td>
</tr>
<tr>
<td>Zeguan Wu</td>
<td><em>Preconditioned Inexact Infeasible Quantum Interior Point Method for Linear Optimization</em></td>
<td>23</td>
</tr>
<tr>
<td>Miaolan Xie</td>
<td><em>High Probability Iteration and Sample Complexity Bounds for Stochastic Adaptive Step Search</em></td>
<td>24</td>
</tr>
<tr>
<td>Jinwen Yang</td>
<td><em>Nearly Optimal Linear Convergence of Stochastic Primal-Dual Methods for Linear Programming</em></td>
<td>25</td>
</tr>
<tr>
<td>Chennan Zhou</td>
<td><em>Effective scenarios in Two-stage DRO: properties and acceleration of decomposition algorithms</em></td>
<td>26</td>
</tr>
</tbody>
</table>
## Accommodations

- **Hotel:** Comfort Suites  
  - **Address:** 120 W. Third Street, Bethlehem, PA  
  - **Phone:** (610) 882-9700  
  - **Distance:** 3 minute drive / 7 minute walk to conference venue

- **Hotel:** Wind Creek Bethlehem  
  - **Address:** 77 Wind Creek Blvd, Bethlehem, PA  
  - **Phone:** (877) 726-3777  
  - **Distance:** 7 minute drive / 16 minute walk to conference venue

- **Hotel:** Historic Hotel Bethlehem  
  - **Address:** 437 Main Street, Bethlehem, PA  
  - **Phone:** (888) 231-9320  
  - **Distance:** 6 minute drive / 28 minute walk to conference venue

- **Hotel:** Candlewood Suites Bethlehem South  
  - **Address:** 1630 Spillman Drive, Bethlehem, PA  
  - **Phone:** (610) 849-4100  
  - **Distance:** 7 minute drive / 30 minute walk to conference venue

- **Hotel:** Hyatt Place Bethlehem  
  - **Address:** 45 W. North Street, Bethlehem, PA  
  - **Phone:** (610) 625-0500  
  - **Distance:** 8 minute drive / 35 minute walk to conference venue

- **Hotel:** Days Hotel by Wyndham, Allentown  
  - **Address:** 3400 Airport Road, Allentown, PA  
  - **Phone:** (610) 266-1000  
  - **Distance:** 13 minute drive to conference venue

- **Hotel:** Hampton Inn & Suites Bethlehem  
  - **Address:** 200 Gateway Drive, Bethlehem PA  
  - **Phone:** (855) 605-0317  
  - **Distance:** 15 minute drive to conference venue

- **Hotel:** Holiday Inn Express  
  - **Address:** 2201 Cherry Lane, Bethlehem, PA  
  - **Phone:** (610) 838-6110  
  - **Distance:** 20 minute drive to conference venue
Accommodations

- Hotel: SpringHill Suites by Marriott Allentown Bethlehem/Center Valley
- Address: 3800 West Drive, Center Valley, PA
- Phone: (888) 236-2427
- Distance: 18 minute drive to conference venue

- Hotel: Sonesta Select Allentown Bethlehem
- Address: 2160 Motel Drive, Bethlehem, PA
- Phone: (610) 317-6200
- Distance: 14 minute drive to conference venue

- Hotel: SureStay PLUS by Best Western Lehigh Valley
- Address: 300 Gateway Drive, Bethlehem, PA
- Phone: (610) 866-5800
- Distance: 14 minute drive walk to conference venue

- Hotel: Homewood Suites by Hilton – Center Valley
- Address: 3350 Center Valley Parkway, Center Valley, PA
- Phone: (610) 351-6400
- Distance: 13 minute drive to conference venue