

TWO YEAR ANNIVERSARY EDITION

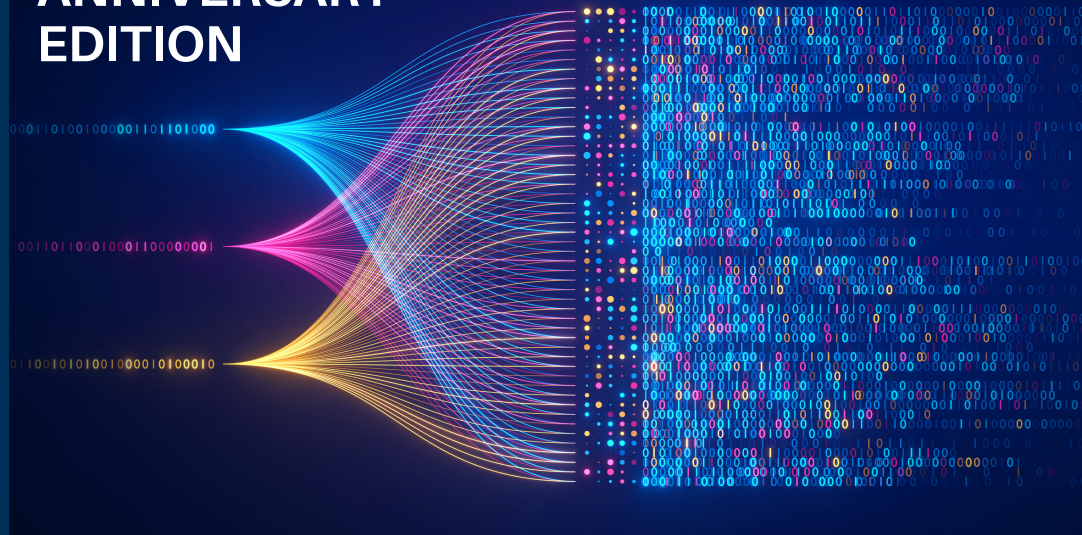


Table of Contents

*click page number/text to view

Page 01

Director's Letter

Page 02

Member Spotlight

Page 03

Two Years of Impact

Page 04

Student Highlights

Page 05

Awards and
Publications

Page 06

News and Education

Page 07

Events and
Conferences

Page 08

Outreach



Scan/click QR code
for past newsletters:

FROM THE DIRECTOR



This month, we are celebrating the second anniversary of AI4OPT, and it's truly impressive to see the impact that the Institute has already made in just two years. Over the past year, AI4OPT has significantly increased its research efforts, expanded its educational programs, and gained new partnerships. The Institute is now widely recognized as a global leader in fusing AI and optimization. Exciting foundational advancements in areas such as optimization proxies, reinforcement learning, and optimization solvers are driving progress in AI applications for supply chains, energy, manufacturing, and sustainability. For those interested in diving into the Institute's research, I highly recommend reading the **brief introduction** we wrote for AI Magazine.

Our Faculty Training Program is operating at full speed, with the first cohort already establishing minors and majors at their respective institutions. We also organized eight Seth Bonder Camps last summer, held at Georgia Tech, UC Berkeley, and virtually. We are also proud to welcome new collaborators, including industrial partners such as Best Buy, Keysight, and Southern Company, as well as our fellow AI Institute, ICICLE.

This newsletter is centered around the impact that AI4OPT has made over the past year and the impact it continues to make today. It features a spotlight on Managing Director Kevin Dalmeijer and Ph.D. student Jorge Huertas. Focusing on the future, I am excited to lead AI4OPT into its third year. Besides doing world-class research, we are making plans to keep pushing the educational programs, and we are exploring a commercial arm of the Institute to support the implementation of our work. Of course, none of these achievements and milestones would be possible without the continued support of Georgia Tech, the NSF, and the incredible members of AI4OPT. Thank you!

- Pascal Van Hentenryck

MEMBER SPOTLIGHT

Q&A WITH AI4OPT LEADERSHIP



AI4OPT Managing Director **Kevin Dalmeijer** is a Senior Research Associate for the H. Milton Stewart School of Industrial and Systems Engineering at Georgia Tech. He obtained a Ph.D. in Operations Research from the Erasmus School of Economics, and he has worked on challenging problems in mobility, transportation, and logistics. His research focuses on redesigning public transit to improve mobility and automating supply chains to leverage AI and optimization.

How would you describe your role with AI4OPT?

As the managing director, I am responsible for the daily operations of AI4OPT. I have the fortune to lead a seven-person team of incredible people who manage data security, partner relations, finances, event planning, communications, and much more. An important part of my job is to monitor the progress of AI4OPT and ensure that we meet the requirements of the National Science Foundation (NSF). While most of my time is spent managing the Institute, I stay involved in AI4OPT research to stay in touch: right now, I am working on an exciting project with Ryder on autonomous trucking.



What do you enjoy most about your work?

It has been amazing to see over 70 faculty and students from six universities come together to advance research in a way that benefits society. Turning funding into a coordinated research endeavor takes work, and I enjoy seeing the many different methods and angles that people are exploring to reach the same goal. Working with students is another major benefit of being an academic. I like listening in when I catch students in front of a whiteboard, learning something new, and helping where I can. Finally, being involved in organizing educational initiatives, such as the Faculty Training Program and the Seth Bonder Camps, is very fulfilling to me.

Where do you see AI4OPT now and in the future?

AI4OPT has grown into a mature organization with the right processes in place, and important programs such as the longitudinal internship program have been institutionalized. Important partnerships are in place to ensure the Institute can conduct impactful research. A major focus of the last year was to recruit the right students and postdocs and ramp up the research. With 100+ papers and 500+ citations already, this is definitely happening. More importantly, the work of AI4OPT is recognized as highly impactful: recently, I represented AI4OPT at a showcase in Washington D.C., and our work really seemed to impress staffers and government officials alike. In the future, I hope AI4OPT will continue to do impactful work, and we have plenty of plans to make that happen. This includes expanding the management team with two new positions to help set up new projects and education initiatives and building a commercial arm to support applications.



TWO YEARS OF IMPACT

0100000000110010101001000010100010

October marks AI4OPT's two-year anniversary, during which it has become the nexus of AI and optimization for real-world challenges in domains like supply chains, energy systems, manufacturing, and sustainability. Our institute is structured around research, education, industry partnerships, collaborations, and community engagement.

OUTREACH AND PARTNERSHIPS

AI4OPT is gaining new partnerships, exemplified by our recent collaborations with esteemed institutions like Jackson State University in Mississippi and Huston-Tillotson University in Austin, Texas. Our Industrial Partners Program (IPP) continues to thrive, encompassing the entire spectrum of supply chain activities, from inception to execution, and the intricate planning and operation of electrical power systems.

OUR GROWTH

During this time, our AI4OPT members have grown to include 70+ faculty, postdocs, and students, and we've also expanded our management team. We have also launched a **Student Leadership Council** (SLC). See below:



Jorge Huertas
Georgia Tech



Rachel Harris
Georgia Tech



Ritesh Ojha
Georgia Tech



Anna Deza
UC Berkeley



Guillaume Goujard
UC Berkeley



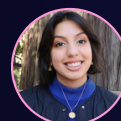
Alicia Tsai
UC Berkeley



Haoming Li
USC



Taoan Huang
USC



Yasmina Al-Aboudy
HerWILL

COLLABORATIONS AND INTERNSHIPS

AI4OPT remains committed to offering unique and extensive internships, providing students with hands-on experiences. We have strong collaborations with the Department of Energy (DOE) national laboratories, Independent Systems Operators (ISO), and similar institutions across the world.

One particular project we are looking forward to is the ongoing collaboration with the AI Institute for Intelligent Cyberinfrastructure with Computation Learning in the Environment (ICICLE), led by The Ohio State University, where we collectively oversee decentralized, collaborative, and multimodal food supply chains. We have a dedicated focus on aiding tribal communities.



ICICLE
DEMOCRATIZING AI

Lastly, our aim to advance AI and optimization reaches far and wide, holding the space for numerous exciting projects yet to come.

STUDENT HIGHLIGHTS

HEAR FROM OUR STUDENTS

Meet **Jorge Huertas**, a third year Ph.D. student specializing in Operations Research at Georgia Tech's H. Milton Stewart School of Industrial and Systems Engineering (ISyE). He holds dual bachelor's degrees in Industrial Engineering and in Systems and Computing Engineering, and a master's degree in Industrial Engineering from Universidad de los Andes (Uniandes) in Colombia; and he is Six Sigma Black Belt certified from Arizona State University. He currently is a Graduate Research Assistant under AI4OPT Director Pascal Van Hentenryck, working on optimizing semiconductor manufacturing supply chain planning in collaboration with Intel. Jorge's previous experience as an Instructor at Uniandes, as a Researcher and coordinator of the Center for Optimization and Applied Probability (COPA), and as a consultant for the World Bank, led him to tackle diverse problems in transportation, logistics, healthcare, and communications systems through data analysis and mathematical modeling. Currently, he is the President of the AI4OPT Student Leadership Council (SLC).



Website

[Google Scholar](#)

[LinkedIn](#)



Intel Internship and Ph.D. Research

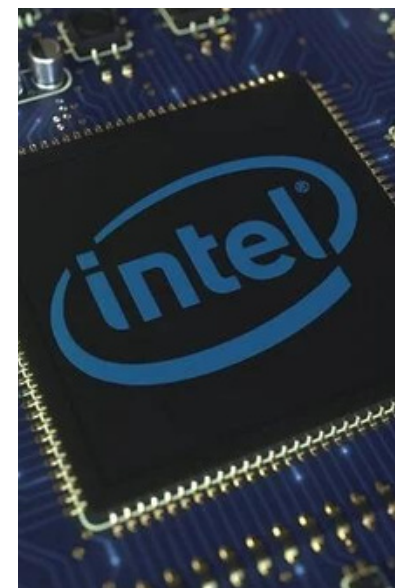
By Jorge Huertas

I joined AI4OPT in May 2022 during the second year of my Ph.D. program. Before, I was working in the Socially Aware Mobility Lab on large-scale evacuation planning, and on the MARTA Reach pilot deployed in Atlanta. In my third year, I was looking for an internship and Pascal led me to a unique opportunity at Intel. Balancing this internship with my Ph.D. and research has been exciting, challenging, and essential, as my research is closely tied to the operations in the semiconductor supply chain.

Our collaboration aims to infuse trust in Intel's operations by merging AI and optimization to enhance their tools and clarify optimization results for business-level understanding. Our four primary objectives, driven by Intel's goals, focus on improving performance, explainability, addressing complex scenarios, and allowing faster sensitivity analysis. These goals ultimately address the efficiency and resilience in semiconductor supply chains.

I work within Intel's Customer Planning and Logistics Group (CPLG) under the Supply Chain Management and Decisions Science (SMDS) Team. My internship is different from other internships at Intel, emphasizing its research-oriented focus and its extended duration. Collaborating with diverse colleagues at Intel has been rewarding and my interactions with Intel's engineers and developers have been inspiring. Our long-term collaboration allows us to balance short-term Intel goals with extensive research, contributing to my Ph.D. thesis. I plan to continue this journey for at least two more years, gradually integrating new optimization and machine learning models into Intel's tools.

Managing tasks and striking a balance between Intel's immediate needs and broader research goals is a rewarding challenge. My focus moving forward is on intricate aspects of machine learning and optimization while maintaining relevance to my Ph.D. thesis.



AWARDS AND PUBLICATIONS

WE TAKE PRIDE IN OUR WORK AND ACHIEVEMENTS



Michael Klamkin

Michael Klamkin received the President's Fellowship and the John Morris Fellowship from Georgia Tech's ISyE. He is a senior industrial engineering major at Georgia Tech, focusing on AI for Optimization (AI4OPT) and working on the Alternating Current Optimal Power Flow (ACOPF) problem, an NP-hard optimization challenge in power grid management.

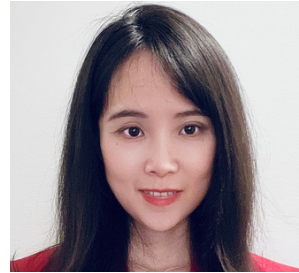
Under the award-winning work titled "**Sequential Predictive Conformal Inference for Time Series**," Chen Xu, working under the guidance of Prof. Yao Xie in the AI4OPT thrust "Decision Making Under Uncertainty," received recognition as runner-ups for best-paper award at the 2023 International Joint Conference on Artificial Intelligence (IJCAI) workshop.

Chen Xu, in collaboration with Xiuyuan Cheng, and under the supervision of Prof. Yao Xie, also had their work titled "**Invertible normalizing flow neural net-works by JKO scheme**" accepted as a spotlight paper at the 37th Conference on Neural Information Processing Systems (NeurIPS 2023).



Chen Xu

"We believe the method we develop will also be useful for other research problems in AI4OPT." - Chen Xu



Yao Xie



Bistra Dilkina



Aaron Ferber

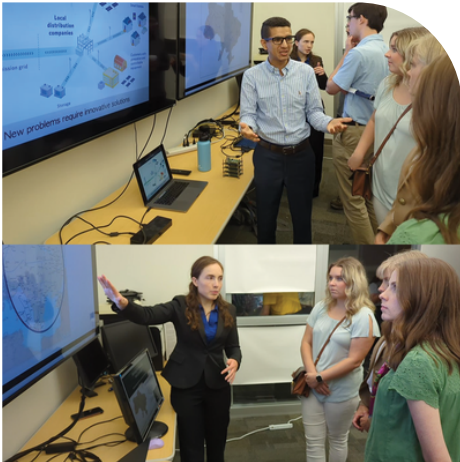


Taoan Huang

Aaron Ferber and Taoan Huang, both students of the AI4OPT Institute, along with their supervisor Bistra Dilkina, who also serves as the University of Southern California (USC) site director for AI4OPT, and their collaborative co-authors, have achieved a remarkable milestone by securing the Outstanding Paper Award for their paper titled "**SurCo: Learning Linear SURrogates for Combinatorial Nonlinear Optimization Problems**." This recognition was received at the Sampling and Optimization in Discrete Space workshop during the International Conference on Machine Learning (ICML).

NEWS AND EDUCATION

EDUCATIONAL INITIATIVES AND WORK OF OUR STUDENTS



Georgia congressional delegation staffers attended a cybersecurity presentation at Georgia Tech's Klaus Advanced Computing Building. AI4OPT Ph.D. students from Georgia Tech, Mohammad Alkhrajah and Rachel Harris, along with their advisor Daniel Molzahn, an assistant professor in the School of Electrical and Computer Engineering at Georgia Tech and Co-Lead of the AI4OPT Energy Thrust team, delivered informative presentations. Molzahn mentioned both students for effectively simplifying and visualizing complex technical content to inform Georgia's political leaders about Georgia Tech and AI4OPT's efforts to secure our electric power infrastructure.

The 54th Annual Meeting of the Decision Sciences Institute will feature AI4OPT Director Pascal Van Hentenryck, who will present a keynote on: AI-Assisted Large-Scale Decision Making for Societal and Technological Challenges which takes place Sat, November 18, 2:50 to 4:20pm, Atlanta Marriott Marquis, Floor: Marquis Level, Imperial A.



During the 10th International Congress on Industrial and Applied Mathematics (ICIAM), AI4OPT Director Pascal Van Hentenryck spoke on the topic: Fusing Machine Learning and Optimization: Achieving Breakthroughs in Achieving Breakthroughs in Decision-Making in Waseda University, Tokyo, Japan August 20-25, 2023.

Photos from Seth Bonder Camp (Level 2)

July 24-28, 2023



MARK YOUR CALENDAR!

AI4OPT EVENTS

AI4OPT TechFest



SAVE THE DATE!

Date/Time: November 9; 8:30am - 4pm

Location: Krone Engineered Biosystems Building

AI4OPT Seminar Series Continues



Lei Ying will present on the topic: "Are CMDPs Fundamentally Harder than MDPs?"

Ying is a professor at the Electrical Engineering and Computer Science Department at the University of Michigan, Ann Arbor, an IEEE Fellow, and an Editor-at-Large for the IEEE/ACM Transactions on Networking.

Date/Time: Thurs, Oct 26; Noon - 1pm

Location: Coda Building (9th floor Atrium)

Virtual: <https://gatech.zoom.us/j/99381428980>

- To watch past seminars, click [here](#).
- To sign up to our seminar series mailing list, click [here](#).

CONFERENCES

Avant South



Members of AI4OPT will be there to showcase the latest work and research. Join us during the free interactive showcase of AI demonstrations from Georgia Tech and its partners in the courtyard of Coda Sept 28 from Noon - 6pm.

SAIL Summit 2023



AI4OPT is participating in the SAIL conference organized at Georgia Tech. The public is open to attend the AI Institutes Exposition & Engagement Showcase linked above.

INFORMS 2023



Next month, AI4OPT members will speak, present, and connect with the INFORMS community, engage with experts in Operations Research and Management Science (OR/MS) to address the challenges and opportunities presented by the increasing volume and complexity of data.

OUTREACH

NEW FEATURES

NEW AI4OPT MEDIA CENTER

You can now explore AI4OPT through in-depth podcasts about the latest AI research, transformative education, and partnership and collaboration videos. The AI4OPT Media Center serves as a hub for various interactive activities and initiatives.

Research
Presentations
Podcasts

[Access Media Center](#)



CONNECT WITH US

Our objective is to enhance community engagement by leveraging cutting-edge AI and optimization technologies to tackle some of society's most pressing issues, including energy, logistics, and supply chains, resilience, sustainability, circuit design, and control.

To stay up-to-date on our ongoing projects, research, and community events, we encourage you to subscribe and follow us. If you are interested in media relations or learning more about AI4OPT's research, education, and partnership initiatives, please do not hesitate to get in touch with us via email or phone.

Stay informed by subscribing to our newsletter and following [@AI4OPT](#) on social media!

[Click here to subscribe to newsletter!](#)

