



# AI Institute for Advances in Optimization

The Opt-In Newsletter | September 2024



**Pascal Van Hentenryck**  
Director of AI4OPT

## LETTER FROM THE DIRECTOR

It's the start of a new academic year, and the momentum at AI4OPT is stronger than ever. Over the summer, our initiatives have expanded significantly, laying the groundwork for an exciting year ahead.

The success of the Level 3 Seth Bonder Camp highlighted the impressive capabilities of high school students exploring deep learning over the summer, while UC Berkeley's Workshop for Community College Faculty equipped educators with advanced analytics tools. These achievements demonstrate our commitment to inspiring the next generation of AI and optimization enthusiasts. In this newsletter, we also shine a spotlight on our Director of Education, Michael Butros, and postdoctoral fellow Rosemarie Santa González.

At the same time, our new partnership with PSR, Inc. is positioned to revolutionize energy systems across Latin America and the US, using AI to enhance the integration of renewable energy.

The arrival of eight new Ph.D. students at Georgia Tech also brings fresh perspectives and innovative ideas to our growing community. As we reflect on our third-year annual review, it's clear that we are just getting started. Together, we're ready to tackle new challenges and make a lasting impact.

- Pascal Van Hentenryck

## Management Team Member Spotlight



Michael Butros holds an MS in Mathematics from Northern Arizona University (2000) and is currently pursuing an MS in Analytics through Georgia Tech's ISyE department. As the Director of Education within AI4OPT, he brings 24 years of teaching experience in physics and mathematics at Victor Valley College, where he served from August 2000 to June 2024. His expertise now contributes to AI4OPT's mission to drive advancements in artificial intelligence (AI) and optimization.

## Michael Butros

AI4OPT Director of Education



As Director of Education at AI4OPT, I focus on expanding access to AI education and fostering inclusion. Our initiatives engage students early, support educators, organize mentorships, and broaden participation, aligning with AI4OPT's mission to bridge opportunity gaps in AI education and research.

Since joining in June 2024, I've contributed to launching Seth Bonder Camp (SBC) Levels II and III and presented at the Faculty Training Program (FTP). I'm also working with Intel to integrate their "AI for Engineering" materials into our upcoming Professional Development Program. Additionally, I've supported NSF proposals for undergraduate AI research and collaborated with Clark Atlanta University on the AIHUB@CAU initiative.

My passion for AI grew through AI4OPT's Faculty Training Program and research with Dan Molzahn, an AI4OPT co-leader and an assistant professor at the School of Electrical and Computer Engineering.

Engaging with the institute's talented faculty and students continues to fuel my enthusiasm. Looking ahead, I aim to expand outreach, enhance our summer programs, and establish AI degree pathways at two- and four-year schools, along with graduate programs. My goal is to support AI4OPT's mission through and through.

## Postdoctoral Fellow Highlight



Rosemarie Santa González is a postdoctoral fellow at Georgia Tech and a member of AI4OPT. She joined the team to apply her expertise in logistics and supply chain. Her research focuses on socially responsible logistics, using AI optimization to address challenges in healthcare, disaster management, and food supply chains, with a strong emphasis on serving marginalized communities.

Santa González leads projects that promote ethical AI frameworks for social equity and resilience. She also coordinates the Seth Bonder Camps, which provide minority high school students with essential coding and data science skills.

Rosemarie Santa González



## Initiatives and Impact at AI4OPT

Rosemarie Santa González leads efforts to democratize AI and optimize logistics for marginalized communities. As a pioneer in the collaboration between NSF AI institutes ICICLE and AI4OPT, she focuses on integrating AI in agricultural logistics. Her Agent-Based Model, FASS, empowers decision-makers to address food insecurity among underrepresented groups, while her work with Native American communities promotes health through food initiatives.

Partnering with the Wisconsin Food Hub Cooperative and Feeding America, she develops decentralized food systems that enable minority farmers to access markets and create economic opportunities. Committed to ethical AI, Santa González advocates for frameworks that prioritize data privacy and social responsibility.



As the onsite coordinator for the Seth Bonder Data Science Camps, she designs engaging schedules and mentors campers, fostering an inclusive environment. Her leadership roles, including her involvement as an ICICLE Educational Fellow and an Inclusive STEM Teaching Fellow, emphasize equity and resource access in STEM education.



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Outside of her research, she promotes wellness through yoga and creative pursuits like watercolor painting and embroidery, balancing her professional and personal interests.

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## News



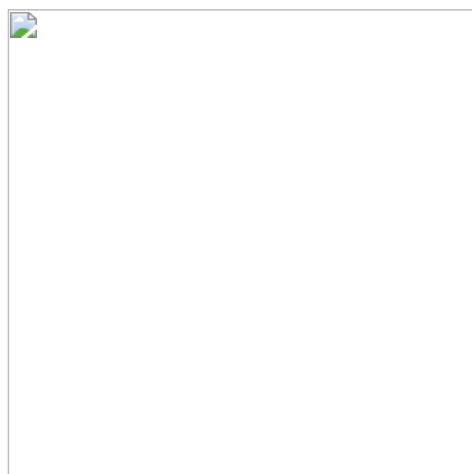
AI4OPT and Partners Highlight Educational Initiatives at Congressional AI Showcase



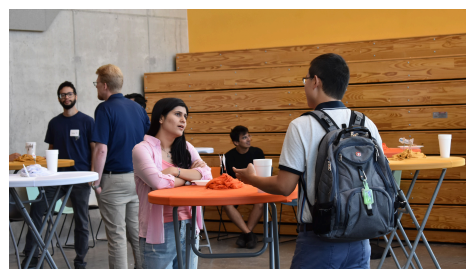
AI4OPT and PSR Partner to Transform US Energy Industry



AI Hub Planned for CAU Under \$2.79M NSF Grant with AI4OPT at Georgia Tech



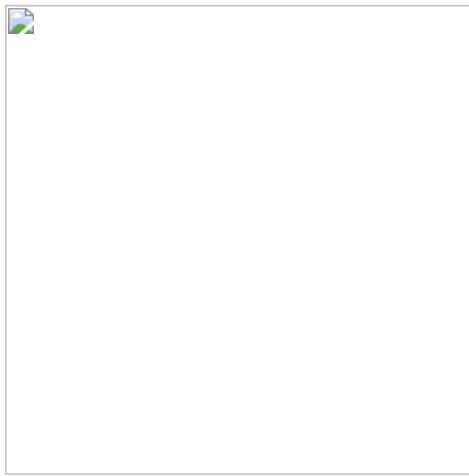
LANL and Georgia Tech Partner for Advanced AI Research on Energy Grids



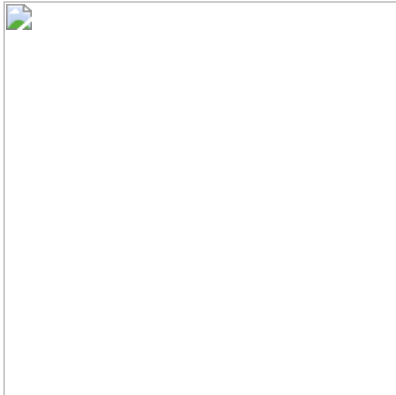
AI4OPT kicked off the school year with a Social Hour at Coda, where students connected with members to explore research opportunities.



A major thank you to Thiago Serra, Assistant Professor of Business Analytics at Bucknell University, for visiting AI4OPT to present on optimization over trained neural networks, focusing on constraint learning. Thiago previously spoke in our seminar series on "Getting Away with More Network Pruning: From Sparsity to Geometry and Linear Regions." We appreciate your insights, Thiago!



Hongzhao Guan, a Ph.D. student at Georgia Tech and a member of AI4OPT, successfully defended his thesis titled Incorporating Travel Behaviors into Transit Network Designs: Methods, Applications, and Extensions on August 19, 2024. His research focuses on optimization and machine learning, particularly their applications in mobility and supply chain.



Founders of LAMPS PUC-Rio, Alexandre Street and Davi Valladão, visited AI4OPT at Georgia Tech with Prof. Pascal Van Hentenryck. After years of collaboration and sending five PhD students to Georgia Tech, they exchanged experiences and strengthened their partnership for ongoing research in Optimization-based AI, time series forecasting, and power systems. See most current collaboration:

[Learn more](#)

For more news, click [here](#).

AI4OPT videos are available in the [Media Center](#).

## Upcoming Events

AI4OPT is gearing up for a significant presence at several upcoming events in October, including the Summit for AI Institutes Leadership 2024, the AI Institutes Expo, and the 2024 NSF ExpandAI Leadership Workshop (EXAIL). Here's how AI4OPT will engage in these vital gatherings:



### **EXAIL - 2024 NSF ExpandAI Leadership Workshop (October 7)**

On the same day as the Summit, AI4OPT will also be represented at the EXAIL workshop. This in-person event will provide a platform for networking with fellow leaders in the ExpandAI program and AI Institutes. AI4OPT will seize this opportunity to showcase its successes, discuss challenges, and collaboratively explore innovative solutions with other leaders.



### **SAIL - Summit for AI Institutes Leadership 2024 (October 7-9)**

AI4OPT will participate in the Summit in Pittsburgh, Pennsylvania, where leaders from various AI institutes will gather to share insights and foster collaboration. This event will be a pivotal opportunity for AI4OPT to engage with other institute leaders, discussing innovative strategies and sharing best practices in AI research and education, while members will also participate on panels, discussions and more.



### **AI Institutes Expo Day (October 10)**

Following the Summit, AI4OPT will be actively involved in the AI Institutes Expo at Carnegie Mellon University. This public event aims to showcase how AI is addressing various challenges, including those in agriculture, education, and molecular manufacturing. AI4OPT will present its initiatives and demonstrate the impactful ways AI is being applied within its programs, encouraging attendees to explore and engage with the innovative solutions on display.

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## **Outreach and Education**

### **The Faculty Training Program Update**



Professors Ming Ho and John Redden, members of the Faculty Training Program (FTP) with Redden from Cohort 1 and Ho from Cohort 2, attended the "Journey Through the World of Analytics" workshop hosted by UC Berkeley's IEOR Department. This event, designed for community college faculty, explored how to integrate analytics methods into the curriculum, in August.

Over three days, participants engaged in sessions covering optimization, machine learning, ridesharing analytics, financial engineering, and simulation techniques. They learned about dynamic pricing models in ridesharing, the applications of reinforcement learning in finance, and how simulation can enhance curriculum relevance.



Organized in collaboration with AI4OPT, the workshop provided valuable data-driven skills relevant to today's industries. It was an excellent opportunity for faculty to connect with the talented minds at Berkeley IEOR and exchange insights on improving student outcomes.

## HerWILL 2024 STEM Experience: AI for Equality Datathon & Workshop

*New transformative initiative designed to empower students—especially women—through AI and Data Science!*

- Workshops: Four engaging sessions with world-class experts.
- 7-Day Datathon: Tackle real-world challenges with mentorship from top professors at Harvard, MIT, and Georgia Tech.
- Prizes & Recognition: Cash prizes, Google certificates, and personalized letters of recommendation for top performers.

### Why Join?

1. Future-Ready Skills: Gain practical experience in two of today's most sought-after fields.
2. Networking: Learn from and connect with global experts and industry leaders.
3. Real-World Impact: Apply skills to meaningful challenges.
4. Career Growth: Enhance your resume and career prospects!

[Register Here](#)

Registration Deadline: October 4, 2024

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## Publications

The latest AI4OPT publications are now available on [Google Scholar](#).

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