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FROM THE DIRECTOR

AI4OPT is proud of its educational programs aimed at democratizing access to AI, with many of these initiatives taking place during the summer. For high school students, the Seth Bonder summer camps provide a great opportunity to gain a better understanding of careers and opportunities in industrial engineering and operations research. The “Level 1” camps, hosted at Georgia Tech and UC Berkeley, were resounding successes, thanks to the hard work and dedication of numerous individuals both on and off the stage. Among them, Jason Lu stands out and is featured in this newsletter. We are also excited to launch the “Level 2” camps, which will introduce fresh material to returning students.



In addition to the summer camps, we were also fortunate to welcome participants from the Faculty Training Program to Georgia Tech again this summer. Professors from Historically Black Universities and Colleges (HBCUs) and Minority Serving Institutions (MSIs), have made remarkable strides in integrating AI and data science into their institutions.

This newsletter spotlights Farzana Hussain as just one example of their achievements. Other participants have begun offering AI courses at their respective schools, pursued further education in Master of Science (MSc) programs specializing in analytics, and even engaged in research collaborations with AI4OPT faculty. The progress made in just over a year by this program is truly impressive, and AI4OPT remains committed to providing an ongoing platform of support for its participants.

- Pascal Van Hentenryck

FACULTY TRAINING PROGRAM PARTICIPANT SPOTLIGHT



Farzana Hussain, an associate professor and chair of mathematics at Huston-Tillotson University, brings an impressive 25 years of teaching experience in the United States and Bangladesh. Specializing in Numerical Mathematics, Farzana's expertise spans subjects such as Calculus, Geometry, Differential Equations, and Statistics. She possesses a strong command of programming languages, including ForTran and C++, enhancing her teaching and research abilities. Farzana thrives in fast-paced environments, excelling both independently and as a valuable team member. Her significant contributions to computational mathematics research have earned her well-deserved recognition. Starting from Fall 2023, she will pursue an online master's program in analytics at Georgia Tech.

Embracing AI and ML Through Growth and Impact

By Farzana Hussain

In recent years, I felt the need to explore beyond traditional mathematics education and dive into the realms of Artificial Intelligence (AI) and Machine Learning (ML). This led me to the faculty training program, where I eagerly embraced these cutting-edge technologies and their practical applications. I aimed to ignite my students' curiosity by demonstrating the real-world relevance of AI and ML, going beyond introductory statistics. To bridge the gap between traditional mathematics education and the dynamic world of AI and ML, I established the Mathematics and Data Science Club at my institution. Starting with my undergraduate students, the club quickly grew to include professionals from diverse backgrounds, fostering a rich exchange of perspectives and experiences. The club has also been granted official affiliation with the prestigious "National Student Data Corps," a prominent program operated by the "Northeast Big Data Innovation Hub."

Through interactions with my students, I realized the importance of providing resources and support to enhance their understanding. To further strengthen my expertise in AI and ML, I pursued additional certifications such as the IBM Data Science Professional Certificate and the IBM Professional Data Analytics Certificate. Equipped with this knowledge, I set out to develop minor and certificate programs, empowering students with the skills needed to thrive in an AI-driven world. While encountering challenges in securing funding for these programs, I persevered by partnering with AI4OPT and submitting a proposal to the National Science Foundation (NSF). This collaboration has been instrumental in realizing my vision, enabling students to access cutting-edge education and resources.

Participating in the AIM-AHEAD Fellowship Program in Leadership further enriched my journey, allowing me to apply AI and ML knowledge in the healthcare sector. The AIM-HI award served as recognition for my contributions, reaffirming my belief in the transformative power of these technologies.

My visit to Georgia Tech as part of the faculty training program has been a remarkable experience, fostering collaboration, stimulating discussions, and building a supportive network of like-minded professionals. These interactions have contributed to my personal and professional growth. I'm excited about organizing an upcoming international conference, providing a platform for students to gain insights from field experts and fuel their passion for AI and ML.

The faculty training program, in conjunction with AIM-HI, has allowed me to bridge the gap between theory and real world applications. My dedication to empowering students and creating impactful programs remains steadfast.

**International Conference on Science, Technology,
Engineering, Mathematics and Education**

Location: Zoom/Virtual
Date: August 7 - 11, 2023
Registration is **free** and open for all!
To RSVP, click [here](#).

AWARDS & ACCOMPLISHMENTS

WE TAKE PRIDE IN OUR WORK AND ACHIEVEMENTS

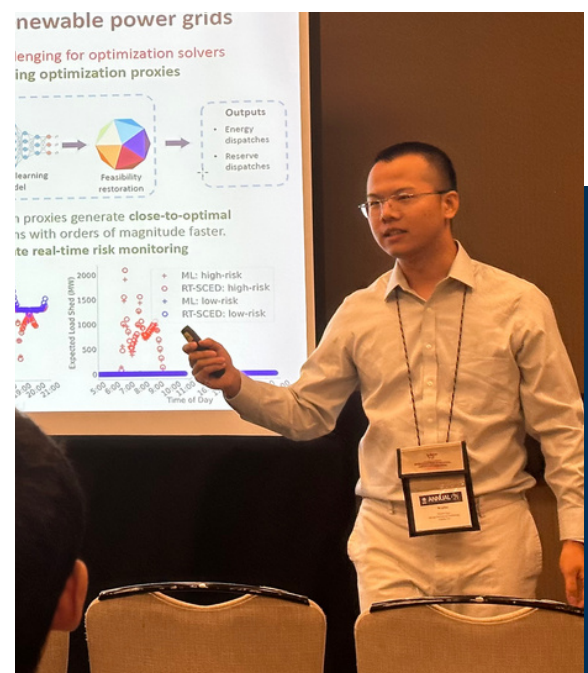


Justin Romberg has been awarded the Distinguished Faculty Achievement Award for his significant contributions throughout his career. He holds the positions of Schlumberger Professor and Associate Chair for Research in the School of Electrical and Computer Engineering at Georgia Tech. Additionally, he serves as AI4OPT's Deputy Director and Associate Director for the Center for Machine Learning. In recognition of his accomplishments, Justin Romberg will receive a commemorative plaque.



Daniel Molzahn, an assistant professor in the School of Electrical and Computer Engineering at Georgia Tech, co-leads the AI for Energy Team with AI4OPT. He has been honored with the Outstanding Junior Faculty Member Award and plaque, which acknowledges the exceptional performance of assistant professors and/or associate professors in ECE within 10 years of their initial faculty appointment.

Wenbo Chen, a fourth-year ML Ph.D. student at Georgia Tech's H. Milton Stewart School of Industrial and Systems Engineering (ISyE), wins big at the IISE Annual Conference & Expo with his successful thesis titled "Confidence-Aware Graph Neural Networks for Learning Reliability Assessment Commitments." Chen serves as an AI4OPT graduate research assistant under the mentorship of Pascal Van Hentenryck.



STUDENT HIGHLIGHT

GET TO KNOW OUR STUDENTS



Meet **Jason Lu**, a 2022 graduate of Georgia Tech, obtained a Bachelor of Science degree in Industrial Engineering with a minor in Scientific and Engineering Computing. During his undergraduate studies, he served as an undergraduate research assistant under AI4OPT Director Pascal Van Hentenryck, since

February 2021. Lu's research in the Socially Aware Mobility Lab centered on optimizing mobility and transit systems using machine learning techniques. Lu's work primarily focused on enhancing On-Demand Multimodal Transit Systems. Following his graduation, he assumed the role of a temporary research assistant in January 2023, continuing his contributions to the Socially Aware Mobility Lab and AI4OPT's supply chain thrust. In this capacity, he focused on optimizing freight routing applications. This upcoming Fall, Lu will commence his Ph.D. studies in Civil Engineering, alongside pursuing a Master of Science degree in Industrial and Operations Engineering at the University of Michigan.

Q: What is it about artificial intelligence (AI) and optimization that really captures your interest?

A: I became fascinated with AI and optimization because I wanted to contribute to a more efficient and intelligent society. This requires engineering systems and modeling real-world phenomena on a massive scale, which is where AI and optimization come into play.

I specifically chose to focus on AI and optimization applied to transportation for two main reasons. Firstly, it has a direct impact on nearly everyone, making it a field with immense potential. Secondly, there is a great opportunity for transportation systems to achieve full efficiency and intelligence. We have only scratched the surface of what is possible in this domain.

Working under the guidance of my advisor, Prof. Pascal Van Hentenryck, solidified my commitment to a research career centered around AI and optimization for transportation. Joining AI4OPT further strengthened my dedication as I began working on AI and optimization for supply chains.

Once I complete my Ph.D., my ultimate goal has been to become a professor and establish my own lab dedicated to AI and optimization for intelligent transportation systems and other relevant fields. I aim to educate people about the significance of AI and optimization in today's world.

Q: Can you tell us about something unique or special that sets you apart from others in your field?

A: I love teaching. During my time at Georgia Tech, I had the privilege of serving as a TA for four different classes: Statistics & Applications, Decision and Data Analytics, Simulation Analysis and Design, and Constraint Programming. It brings me so much joy to share knowledge, assist students in grasping complex concepts, and foster their growth as learners.



I also have a playful side that allows me to connect with others in a fun and engaging way. One remarkable experience has been leading the Seth Bonder Camp in Computational and Data Science for Engineering as the Head TA. This incredible high school STEM outreach camp incorporates a Marvel theme, where I had the opportunity to embody the role of Captain America. Wearing the Captain America helmet and shield, I not only taught students computer and data science principles but also brought excitement and imagination to the learning environment. Witnessing the students' enthusiasm grow, and hearing their feedback about how enjoyable the camp was, is truly rewarding and reinforces my commitment to inspire the next generation.

Q: When you're not studying or doing research, what do you enjoy doing in your free time?

A: I've been a NASCAR fan since childhood, attending six races in person to fuel my passion for the sport. I'm also a huge UFC fan. One of my favorite things to do during my undergrad was get together with my best friends and have UFC watch parties together during big UFC events.

Outside of sports, I enjoy going to movie theaters, particularly drawn to indie films for their compelling stories and emotional depth. Food— another interest of mine, with Korean BBQ being a personal favorite. Exploring different restaurants, including those in Atlanta, allows me to indulge in this culinary passion.

Lastly, what made Georgia Tech so special for me was the incredible, life-long friends I made. They made Georgia Tech an incredibly fun and memorable experience which I will never forget.



NEWS & PUBLICATIONS



During this summer, AI4OPT members had the opportunity to engage with participants of the Faculty Training Program led by Charles Pierre, who is both the Associate Professor of Mathematics in the Department of Mathematical Sciences at CAU and the leader of AI4OPT's educational thrust. The visit encompassed presentations and interactive Q&A sessions, accommodating both in-person and virtual formats. This marks the second year for the first cohort of participants.

LEARN MORE



Drew Charter High School students had the valuable opportunity to visit the AI4OPT Institute at Georgia Tech, where they immersed themselves in the world of AI research. This experience not only provided valuable insights but also ignited a strong interest in STEM careers, including engineering. To note, some students are also participants in the piloted Level 3 of the Seth Bonder Camp, further highlighting their dedication to academic and career exploration.

SEE FULL STORY



The Level 1 Seth Bonder Summer Camp at Georgia Tech offered Georgia high school students in grades 9-12 an exciting opportunity learn about computer programming using the Snap! visual programming language.

The camp is thoughtfully designed, focusing on essential computational concepts through interactive activities featuring the robot character, "Karel the Robot."

SEE FULL STORY

Publications

AI4OPT plays a significant role in advancing research on education and diversity, exemplified by two notable examples outlined below. Additionally, AI4OPT has published a concise introduction to the Institute, offering a comprehensive overview of its research endeavors and educational programs.

- Nabeel Gillani, Doug Beeferman, Christine Vega-Pourheydarian, Cassandra Overney, Pascal Van Hentenryck, and Deb Roy. Redrawing attendance boundaries to promote racial and ethnic diversity in elementary schools. *Educational Researcher*, page forthcoming, 2023. [doi: 10.3102/0013189X231170858](https://doi.org/10.3102/0013189X231170858)
- Yuri Faenza, Swati Gupta, and Xuan Zhang. Discovering Opportunities in New York City's Discovery Program: Disadvantaged Students in Highly Competitive Markets. *ACM Conference on Economics and Computation*, page forthcoming, 2023. [arXiv:2203.00544](https://arxiv.org/abs/2203.00544)
- Pascal Van Hentenryck and Kevin Dalmeijer. AI4OPT: AI Institute for Advances in Optimization. [arXiv:2307.02671](https://arxiv.org/abs/2307.02671)

OUTREACH & EDUCATION

EMPOWERING MINDS & TRANSFORMING FUTURES



Kids Teach Tech (KTT) Teachers kick-off the Seth Bonder Level 1 camp in partnership with AI4OPT, Georgia Tech's ISYE, UC Berkeley IEOR, and the Urban League of Greater San Francisco Bay Area, engaging students at the UC Berkeley College of Engineering and virtually via Zoom in active learning.

Excitement at the camp continues to grow as Arjun Mulchandani, the 16-year-old Founder of KTT, begins teaching more challenging concepts and real-world applications in Optimization, Data Science, and Artificial Intelligence.

Graduation Day marks the end of the camp in California, with 100% of students expressing a fantastic learning experience. The camp concludes with a tour of UC Berkeley College of Engineering and a Family Symposium where students share their favorite hands-on projects. Some students even join Kids Teach Tech as new Teachers, preparing for Level 2 Camp scheduled from July 24th to 28th.

LET'S CONNECT

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.

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