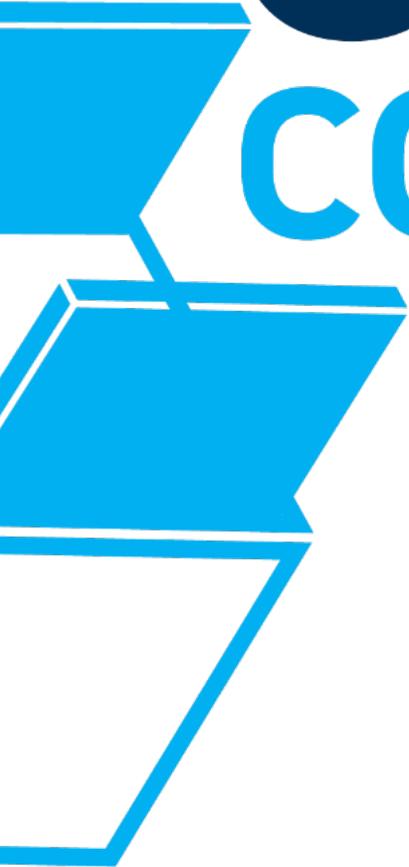


**INAUGURAL** | ONLINE MASTER OF SCIENCE  
IN COMPUTER SCIENCE

# **OMSCS** conference

**May 3–4, 2023**





## Contents

Contents .....	2
Welcome from the Conference Chairs .....	3
Keynote Address: Dr. Zvi Galil.....	5
Agenda: Wednesday, May 3 (Morning) .....	6
Agenda: Wednesday, May 3 (Afternoon) .....	7
Agenda: Thursday, May 4 (first half) .....	8
Agenda: Thursday, May 4 (second half) .....	9
Presentations .....	10
Acknowledgements .....	14



## Welcome from the Conference Chairs



**Dr. Ana Rusch**

Associate Director of Diversity, Equity,  
Inclusion, and Student Life (OMSCS)



**Alex Duncan**

Associate Director of  
Student Experience (OMSCS)

Welcome to the inaugural OMSCS Conference! Less than a year ago, this event was not much more than a vague idea in our minds, and we are thrilled (and yes, somewhat amazed) that it has come to fruition so quickly. Featuring a keynote address from Dr. Zvi Galil, a mini career fair, an evening reception (with games!), and a program filled with diverse and fascinating presentations, the conference will be a special event, and we hope you are as excited as we are.

Connection was a primary motivation for organizing the OMSCS Conference. We naturally want to foster connection between our massive OMSCS student and alumni populations to strengthen the OMSCS community. However, we also want to encourage connections between these folks and the incredible faculty and staff of the program, as well as the broader Georgia Tech community, with its array of student and alumni services and support structures. We hope these connections serve as encouraging reminders that the OMSCS program does not exist in a vacuum; rather, it is sewn tightly into the fabric of the university.

Further, OMSCS is prominently situated in the field of computer science and is recognized not just in the academic sphere, but within industry, as well. We want to nurture mutually beneficial relationships between the OMSCS community and industry professionals, which was the driving idea behind the mini career fair. This is about more than just potential job opportunities (although those are certainly important!). We want OMSCS students and alumni to feel connected to the vast network of computer science professionals; in turn, we want to welcome industry experts to the OMSCS community to promote influential collaborations and new initiatives with impacts beyond the scope of an individual person, university, or organization.



We encourage you to keep this idea of connection in mind during the OMSCS Conference, whether you're a brand new OMSCS student, or you were one of the first OMSCS graduates. We hope you come away from this unique event feeling more connected—to your peers, to the OMSCS program, to Georgia Tech, and to a larger network of like-minded people who are shaping the field of computer science.

We are glad you are taking part in this milestone for the OMSCS program, and we look forward to connecting with you.

— Ana and Alex



## Keynote Address: Dr. Zvi Galil

Wednesday, May 3, 1:10 – 2:10 pm



We are thrilled to have Dr. Zvi Galil as our keynote speaker!

Dr. Galil earned B.S. and M.S. degrees in Applied Mathematics from Tel Aviv University, both summa cum laude, and his Ph.D. in Computer Science from Cornell University. After a post-doctorate at IBM's Thomas J. Watson Research Center, he returned to Israel and joined the faculty of Tel Aviv University, serving as the chair of the Computer Science department from 1979-1982.

In 1982, he joined the faculty of Columbia University, serving as the chair of the Computer Science Department from 1989-1994, and as the Morris and Alma A. Schapiro Dean of The Fu Foundation School of Engineering & Applied Science from 1995-2007. In 2007, Dr. Galil returned to Tel Aviv University and served as president. In 2009, he resigned as president and returned to the faculty as a professor of Computer Science. In July 2010, he became The John P. Imlay, Jr. Dean of Computing at Georgia Tech. In June 2019, he stepped down as dean and became the Frederick G. Storey Chair in Computing and Executive Advisor to Online Programs. Dr. Galil was a moving force behind the establishment of Georgia Tech's Online Master of Science in Computer Science (OMSCS) program, which by Spring 2022 had grown to more than 12,000 students representing more than 100 countries. [Inside Higher Education](#) [noted that](#) OMSCS "suggests that institutions can successfully deliver high-quality, low-cost degrees to students at scale." [The Chronicle of Higher Education](#) [noted that](#) OMSCS "may have the best chance of changing how much students pay for a traditional degree."

Dr. Galil's research areas have been: the design and analysis of algorithms; complexity; cryptography; and experimental design. He has written over 200 scientific papers, edited 5 books, and given more than 250 lectures in 30 countries. He is a fellow of the ACM and the American Academy of Arts and Sciences, and a member of the National Academy of Engineering.



## Agenda: Wednesday, May 3 (Morning)

*\*\*Presentations will be in combined rooms 1116-1118; other events will be in the atrium.\*\**

7:30 am	Venue and attendee check-in open*
8:00 – 8:45 am	Breakfast*
9:00 – 9:15 am	Welcome Address: Dr. Ana Rusch and Alex Duncan
9:20 – 9:40 am	The Health of Our Healthcare: AI and Software Disrupt Another Industry <i>Pransu Dash</i>
9:45 – 10:05 am	Hybrid Social Interactions for Online Education <i>Cherie Lum</i>
10:10 am – 10:30 am	Distance Learning: Lessons from the Remote Confines of a Simulated NASA Spacecraft <i>Russ Klvacek</i>
	--Break--
10:50 – 11:00 am	GT Office of Development <i>Colleen Cox and Lana Simkins</i>
11:05 am – 11:25 am	CP-PINNS: Changepoints Detection in PDEs Using Physics- Informed Neural Networks with Total-Variation Penalty <i>Zhikang Dong</i>
11:30 am – 11:50 am	Advanced Topics in Machine Learning for Trading <i>Silviu Burz</i>

*\* Denotes presentations or events that are available only in person (not virtually)*



## Agenda: Wednesday, May 3 (Afternoon)

**\*\*Presentations will be in combined rooms 1116-1118; other events will be in the atrium.\*\***

12:00 pm – 1:00 pm	Lunch*
1:10 – 2:10 pm	<b>Keynote Address: Dr. Zvi Galil</b>
	---Break---
2:30 – 2:40 pm	GT Alumni Association <i>Alexis Davis</i>
2:45 – 3:05 pm	OMSCS and Power Systems: Bringing Two Worlds Together <i>Alejandro Duque</i>
3:10 – 3:30 pm	Running a Kaggle Competition Team: Insights and Lessons from BirdCLEF with Data Science @ Georgia Tech <i>Anthony Miyaguchi</i>
3:35 – 3:55 pm	Forecasting Renewable Power Generation to Improve Decarbonized Energy Grids <i>Chang Sun</i>
	---Break---
4:15 – 4:35 pm	When Marine History, Ancient Language, and Computer Science Mixed: A Case Study of “Genglubu” Based on Information Technology <i>Dr. Shaoyuan WU</i>
4:40 – 5:00 pm	Music as Discovery: How Generative AI May Impact Our View of Creativity <i>Maritza Mills</i>
5:05 – 5:25 pm	Can ChatGPT Get Into College? An Analysis of ChatGPT’s Performance on High School Standardized Tests <i>Alex Houk</i>
5:30 – 5:45 pm	Wednesday Wrap-Up: Dr. Ana Rusch and Alex Duncan
6:00 – 8:00 pm	Conference Reception & Game Night*

\* Denotes presentations or events that are available only in person (not virtually)



## Agenda: Thursday, May 4 (first half)

*\*\*Presentations will be in rooms 1116-1118; other events will be in the atrium.\*\**

*\*\*Workshops have limited space, and you must be registered for a workshop to attend it.\*\**

7:30 am	Venue and attendee check-in open
8:00 – 8:45 am	Breakfast*
9:00 am – 12:00 pm	Mini career fair, tabling from campus services, and meet the OMSCS team (see below)*
10:00 – 10:45 am	Workshops (simultaneous)*:  Room 1118: Leveraging Serverless to Launch Applications Faster <i>Chinmay A. Anaokar</i>  Room 1117: The Power of Profiling: Optimizing ML Workloads to Reduce Energy Usage, Save Time and Cost <i>Wooyoung Shin</i>  --Break--

*\* Denotes presentations or events that are available only in person (not virtually)*

From 9:00 to noon in the atrium, you will have the opportunity to chat with representatives from J.P. Morgan, the National Security Agency (NSA), BlackRock, and Itential at the mini career fair, as well as representatives from both the Alumni Association and the Center for Mental Health Care & Resources at Georgia Tech! The OMSCS team will also be available to chat with you, so please come say hi!



## Agenda: Thursday, May 4 (second half)

*\*\*Presentations will be in rooms 1116-1118; other events will be in the atrium.\*\**

*\*\*Demos will be in a traditional presentation format and open to all conference attendees.\*\**

11:20 – 11:30 am	Demo: Learning Human Actions Using Temporal Templates <i>Mrityunjay Mishra</i>
11:35 – 11:45 am	Demo: CyHerCode: Teaching Coding Through the Lens of Cybersecurity <i>Zuliat Owoade</i>
11:50 am – 12:00 pm	Assistive Technology Applications for Home Care Patients with Activity of Daily Living Using Mixed Reality <i>Elan Grossman</i>
12:05 – 12:20 pm	Closing Address: Dr. Ana Rusch and Alex Duncan
12:30 – 1:15 pm	Lunch*

*\* Denotes presentations or events that are available only in person (not virtually)*

Following the conference, all attendees are invited to join the campus tour, led by David Joyner, which will depart from the front of the Klaus Advanced Computing Building at 1:30 pm and will last approximately 2 hours.

The Dean's New Alumni Celebration will begin at 4:00 pm in the Klaus Atrium. This event is open **only to graduating students.**



## Presentations

Want to learn about the presenters? Check out the [Presenter Bios](#).

### Wednesday, May 3: Traditional Talks

Presenters listed in **bold**.

9:20 – 9:40 am

**The Health of Our Healthcare: AI and Software Disrupt Another Industry**

**Pransu Dash**

Healthcare as an industry is undergoing rapid software transformations in recent years, and we must hold ourselves accountable when revitalizing an industry that is so ubiquitous and crucial to society. In this talk I hope to explore how technology can bring the benefits of robustly engineered solutions to improve the state of healthcare.

9:45 – 10:05 am

**Hybrid Social Interactions for Online Education**

**Cherie Lum**

Online-only degree programs pose a challenge for students to connect with each other, but it's equally important. Georgia Tech's OMSCS has created social in-person cohorts called Student Life Groups to replicate healthy social connections among online students. The program's success is measured by student attendance in seven major cities.

10:10 – 10:30 am

**Distance Learning: Lessons from the Remote Confines of a Simulated NASA Spacecraft**

**Russ Klvacek**

Technical communication and soft skills are often overlooked or taken for granted in the tech industry. Having spent some time honing these skills over 45 days in a simulated NASA spacecraft and the OMSCS program, I've distilled some lessons and mindsets to provide a jumpstart for communication mastery in your OMSCS career and industry.

11:05 – 11:25 am

**CP-PINNs: Changepoints Detection in PDEs Using Physics-Informed Neural Networks with Total-Variation Penalty**

**Zhikang Dong**

We extend Physics-Informed Neural Networks (PINNs) to accommodate (multiple) random changepoints in PDE dynamics, using a total-variation penalty and a refined dynamic programming method. Our approach improves parameter estimation and model fitting, and lowers training error compared to the original PINNs model.



11:30 – 11:50 am

**Advanced Topics in Machine Learning for Trading**

***Silviu Burz***

CS 7646 (ML4T) introduces students to fundamental analysis and machine learning techniques which are then applied to simplified simulations of stock markets. This talk intends to go beyond the fundamentals that were introduced in the course and introduce attendees to some of the applied and practical challenges involved in trading.

2:45 – 3:05 pm

**OMSCS and Power Systems: Bringing Two Worlds Together**

***Alejandro Duque***

This talk shares the professional experience of how the OMSCS program helped me bring computer science tools to the power system industry, resulting in several successful experiences. It emphasizes the importance of interdisciplinary collaboration and showcases a novel approach to help develop the digital grid of the future.

3:10 – 3:30 pm

**Running a Kaggle Competition Team: Insights and Lessons from BirdCLEF with Data Science @ Georgia Tech**

***Anthony Miyaguchi***

Learn how to lead a successful Kaggle competition team in this talk tackling the BirdCLEF challenge, an information retrieval competition focused on bird conservation. Discover insights on recruiting, techniques, and models used, plus how to engage with the student body on technical projects.

3:35 – 3:55 pm

**Forecasting Renewable Power Generation to Improve Decarbonized Energy Grids**

***Chang Sun, Matt Carney, Pei-Chuan Chao***

We're experimenting with deep learning methods to forecast how much renewables will contribute to grid load at a given time. This is a critical problem to be solved in maximizing the usage of renewables in our electricity grids.

4:15 – 4:35 pm

**When Marine History, Ancient Language, and Computer Science Mixed: A Case Study of "Genglubu" Based on Information Technology**

***Dr. Shaoyuan WU***

This presentation will introduce the audience to "Geng Lu Bu" and my recent study on it based on information technology, such as a methodology for analyzing esoteric texts in an ancient language, cluster analysis for philological and bibliological purposes, Hash fingerprint database, etc.



4:40 – 5:00 pm

**Music as Discovery: How Generative AI May Impact Our View of Creativity**

**Maritza Mills**

Generative AI has the potential to change our views of both human and computational creativity. In this talk we review how our understanding of creativity has evolved over time and how the advancement of generative AI may impact our conception of intellectual property, ownership, and creative identity. To ground our talk in practical application, we'll apply these perspectives to a sample computational music model.

5:05 – 5:25 pm

**Can ChatGPT Get Into College?: An Analysis of ChatGPT's Performance on High School Standardized Tests**

**Alex Houk**

How does ChatGPT score on the SAT, ACT, and other secondary school standardized tests? In this presentation, I will discuss ChatGPT's strengths and limitations in completing secondary school assessments, focusing on my experimental results on the SAT, as well as the wider implications of ChatGPT's performance on these exams.

**Thursday, May 4, 10:00 – 10:45 am: Workshops**

*Presenters listed in **bold**.*

**Leveraging Serverless to Launch Applications Faster**

**Chinmay A. Anaokar**

This is an interactive workshop to learn and launch your own application quickly and cost-effectively using Serverless technology. It is suitable for anyone interested in cloud technology or software development.

**The Power of Profiling: Optimizing ML Workloads to Reduce Energy Usage**

**Michael Shin, Akbar Nurlybaev, John Calderon, Yubo Gao, Xin Li**

Training machine learning models requires significant computation resources, leading to concerns about energy usage and carbon emissions. Please bring a laptop and join this workshop to learn how to use DeepView, an open-source profiler, to optimize ML training and reduce your carbon footprint.

*\*Laptop required\**



## Thursday, May 4: Demonstrations

Presenters listed in **bold**.

11:20 – 11:30 am

### **Learning Human Action Using Temporal Templates**

**Mrityunjay (Manas) Mishra**

We explore how smart visual systems learn human actions using temporal templates. We first understand how temporal templates enable human action recognition. Then, we train a classifier on the KTH dataset and compare its performance to state-of-the-art methods. Finally, we present a variable temporal-length algorithm for HAR in real time.

11:35 – 11:45 am

### **CyHerCode: Teaching Coding Through the Lens of Cybersecurity**

**Zuliat Owoade**

The audience will be shown the educational videos and an overview of the camp curriculum. The demonstration will showcase the exercises with focus on how they align with the underlying learning pedagogies. The presenter will explain how these exercises can be applied in students' daily lives, such as password security.

11:50 am – 12:05 pm

### **Assistive Technology Applications for Home Care Patients Through Mixed Reality**

**Elan Grossman**

For Home healthcare patients with mild cognitive impairment, we developed a prototype mixed reality application in HoloLens(tm) to assist these patients in taking their medication. We used our prototype to gain feedback on how this technology can be used in home hospice care.



## Acknowledgements

The 2023 OMSCS Conference is funded by a generous award from the Provost's Fund for Excellence in Graduate Studies, and we are immensely grateful to the **Office of the Provost** for their support.

We are extremely glad **Dr. Zvi Galil** was eager and available to deliver the keynote address of the inaugural OMSCS Conference, and we deeply appreciate his support of this conference and his continued enthusiasm for the program.

We would like to thank all the company representatives participating in the mini career fair for providing attendees with a rare opportunity to interact with them in person and further their career goals:

<b>Tucker Balch</b> (J.P. Morgan)	<b>Colleen Odom</b> (National Security Agency)
<b>Alex Bird</b> (Itential)	<b>Kevin Hubley</b> (National Security Agency)
<b>Stephanie Fowler</b> (Itential)	<b>Justin Higgins</b> (BlackRock)
<b>James Scheid</b> (Itential)	<b>Ragesh Raveendran Pillai</b> (BlackRock)

We would also like to thank **Alexis Davis** from the Alumni Association, **Colleen Cox** and **Lana Simkins** from the Office of Development, and **Tara Holdampf** and **Rabi'ah Jamar** from the Center for Mental Health Care & Resources for taking the time to connect with OMSCS students and alumni and highlight Georgia Tech's dedication to its online student population.

A lot of hard work went into ensuring the success of the inaugural OMSCS Conference. The event would not have been possible without the support and guidance of the following people:

<b>Kevin Beasley</b>	<b>Colleen Cox</b>	<b>Christopher Roskilly</b>
<b>Brian Boddy</b>	<b>Lana Gilyalova</b>	<b>Terence Rushin</b>
<b>Michael Carson</b>	<b>Cherie Lum</b>	<b>Paul Schultz</b>
<b>LaDonna Cherry</b>	<b>Hannah Moon</b>	<b>Rob Sullivan</b>
<b>Ann Claycombe</b>	<b>Ben Powell</b>	

We are grateful to our small team of **dedicated volunteers** for their help with setup, teardown, check-in, and the myriad other tasks we could not have done without them.

Lastly, thanks to the rest of our **OMSCS team**. Y'all are awesome.