

Program in  
Mathematical Methods  
in the Social Sciences

# 2024-25

## Year in Review

**Northwestern**

WEINBERG COLLEGE OF ARTS & SCIENCES

Program in **Mathematical**  
**Methods in the Social Sciences**

**mmss.northwestern.edu**

# Director **Welcome Letter**



**Professor Ivan Canay**  
Saltzman Family Director  
of the Mathematical Methods  
in the Social Sciences Program

This was my first year as Director of MMSS, and it has truly been a wonderful experience. Even though I started teaching in the program back in 2008, I stepped away in 2014 and was out for a full ten years. Coming back in a new role gave me a fresh perspective on the incredible strength of this program, while also letting me see where we could refresh some content to keep MMSS at the vanguard—delivering a rigorous approach to the questions that matter most today.

This year came with its share of expected challenges and plenty of surprises, but I was impressed by how resilient MMSS is. That resilience comes, in no small part, from the steady support I get from Nicole, and from our students—an open-minded, adaptable group that is always ready to embrace the next challenge.

We also made a point to keep some of our most-loved traditions alive. Trivia night was as fun as ever, and we started something new with a series of interviews with leaders in the industry. In our first session, we hosted our own Igal Hendel, who gave students a fascinating look into how Amazon operates, the types of skills they value, and how an MMSS background prepares students for careers in places like that. Looking ahead, I'm excited for us to keep expanding the ways we support our students, both inside and outside the classroom, to make sure MMSS continues to be the full package of resources and opportunities.

On a personal note, this was also my first year teaching MMSS 386-2. I love this class—not just because I get to teach students about causal inference and advanced econometrics, but because it lets us explore a very modern approach to these topics. What makes it rewarding, and challenging, is that it pushes students in two directions at once: the mathematical rigor of the material, and the conceptual subtleties that separate someone who truly understands the scope, limits, and nuances of these tools from someone who just applies them mechanically. There's still work to do to make the class even better, and I'm committed to refining it so that, in time, it becomes a true favorite among MMSS students.

# Year in Review **Fall 2024**

## September—First Year Orientation: Welcoming the Class of 2028



The MMSS program kicked off the academic year by welcoming the **Class of 2028** at its annual First-Year Orientation, held during Northwestern's Wildcat Welcome Week. This gathering marks the students' official entry into the program and sets the tone for the next four years.

Program Director **Ivan Canay**, First-Year Advisor **Eric Schulz**, and Peer Advisors **Dylan Yan**, **Ethan Jie**, and **Madelyn Gallagher** led an engaging session that blended some inspiration with practical advice. After a lively icebreaker that helped students connect, the session shifted into discussions about academic expectations, time-management strategies, and the unique interdisciplinary nature of MMSS.

A new highlight was a **recorded alumni welcome video**, featuring MMSS alumni from a range of grad years who shared their congratulatory support and words of encouragement. Their messages emphasized curiosity, resilience, and the power of the MMSS community inside and outside of the classroom.

Orientation also offered students the opportunity to hear directly from **Professor Ivan Canay**, who stepped into the role of Program Director this year. In his remarks, he introduced himself not only as an econometrician and longtime member of the Northwestern faculty, but as someone deeply connected to MMSS since first teaching Math 385 in 2008.

"I'm thrilled to introduce myself as the new director of the MMSS program," he shared. "My appreciation for this community has only grown over the years, and I look forward to supporting you as you navigate the challenges and opportunities ahead."



Ethan, Madelyn and Dylan take a moment to pose amidst a very busy Wildcat Orientation Week.

Year in  
review



# Year in Review **Fall 2024**

## October—Fall Welcome Party

»» Our mid-October fall gathering drew a strong turnout of MMSS students, TAs, and faculty. This is the main fall event for MMSS students to connect. It always sets an energetic tone for the year ahead and gives upper-class students a chance to reconnect while welcoming first-year and sophomore-entry students to the MMSS community. Director Canay shared insights on what to expect in the coming year and his enthusiasm for returning to the classroom to teach MATH 386-2. He highlighted the strength of the MMSS major, emphasizing its focus on critical and analytical thinking across disciplines, and noted that students who thrive in MMSS combine strong quantitative skills with intellectual curiosity, openness to diverse perspectives, and a collaborative spirit.



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review







# Year in Review **Winter 2025**

## January—MMSS Trivia Night 2025

»» Thanks to the continued support of the **Nathan Popkins Fund**, MMSS kicked off winter quarter with its second annual **MMSS Trivia Night**—an idea originally proposed by students and now officially a program tradition. What began last year as a pilot event has quickly become one of our favorite winter gatherings.

This year's Trivia Night once again delivered the perfect mid-January boost, offering students a lively break from both the cold and the new-quarter crunch. Attendees were sorted into mixed-grade teams by drawing a piece of candy from a grab bag—a simple twist that sparked instant camaraderie and some very creative team identities inspired by their sweets. We had “Reeses Tear You to Pieces” “M&M&S&S” “Yorkie Dawgs” and “George Skittle” among other competing teams.



The trivia itself ranged widely, covering everything from pop culture and geography to decades-themed questions, Chicago curiosities, and a handful of cheeky MMSS-specific challenges. Laughter, friendly competition, and plenty of surprising knowledge made for a spirited evening.

The event's success continues to highlight Popkins Fund's impact on strengthening community and creating meaningful, student-driven traditions within MMSS.



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review





Teams competed for prizes that included MMSS and NU merch, gift cards to the NU Bookstore and a bag of special treats from Emcee Stew Jamesson.



# Year in Review **Winter 2025**

## February—Career Talk: Amazon Executive Meet-Up in the Cohen Commons

»» MMSS students had a unique opportunity this February to hear from Professor Igal Hendel, who shared insights from his time as Chief Economist at Amazon Web Services (AWS). Amazon has grown into one of the world's most influential technology companies over the past 30 years, reshaping industries from e-commerce to cloud computing—and Professor Hendel offered a behind-the-scenes look at what that transformation really looks like from the inside.

Joined by MMSS Director Canay, Professor Hendel spoke with students about Amazon's corporate culture, how teams collaborate at scale, and how data drives decision-making across the company. Even with heavy snowfall that led to several event cancellations, MMSS students still gathered in the Cohen Commons for an engaging conversation, dinner, and the warmth of a cozy fire. Students especially appreciated how closely Professor Hendel's experiences aligned with the skills and mindset emphasized in the MMSS program. The discussion highlighted how economic reasoning, data analysis, and critical thinking translate directly from the classroom to real-world impact at a global company like Amazon.





Director Canay (seated to the left)  
and Professor Hendel



Professor Hendel's academic work focuses on applied microeconomics and industrial organization, with research on markets with asymmetric information and dynamic consumer behavior. He serves on the Board of Editors of the *American Economic Review* and has held editorial roles with the *RAND Journal of Economics* and the *Journal of Industrial Economics*.



Young  
alumni

# Year in Review **Spring 2025**

## **April—Young Alumni Career Panel**

»» MMSS students had the opportunity to hear directly from alumni working across a wide range of industries, including real estate, finance, consulting, venture capital, and academia. The career panel shifted from an in-person dinner to a Zoom session so we were able to bring in a broader geographic range of alumni. We were happy to welcome back moderator Lilia Kogan who is both an MMSS and KSM graduate and has a career spanning healthcare, consumer and tech industries. She is the Co-Founder and Director of Operations at Ukraine TrustChain, a non-profit focused on aid and evacuation assistance to the Ukrainian community.



**Moderator:  
Lilia Kogan**

Panelists discussed how the interdisciplinary nature of the MMSS major prepared them for both graduate study and professional roles, emphasizing the value of critical thinking, quantitative reasoning, and collaboration. Alumni also shared insights into navigating early career decisions, transitioning from undergraduate study to the workplace or PhD programs, and using MMSS skills to approach complex, real-world problems. The conversation highlighted the many paths an MMSS degree can lead to and reinforced the strength of the MMSS alumni network as a resource for students exploring next steps.

During the panel, alumni shared candid reflections on how MMSS prepared them to navigate unfamiliar, high-pressure environments early in their careers. Evie Berg spoke about stepping into several different roles during her time as an undergraduate that required adaptability and confidence, while Sharadh Sivamani described the fast-paced, uncertain nature of his work in finance and venture capital. He noted that MMSS trained him to be comfortable with not having all the answers, sharing, *“The more I research about anything, the less I actually know. That lesson applies to every aspect of my life. MMSS forces you to build that muscle of tackling uncertainty in a methodical way—it’s hard, but a few years out, you’re incredibly grateful for it.”*

**“The more I research about anything, the less I actually know. That lesson applies to every aspect of my life. MMSS forces you to build that muscle of tackling uncertainty in a methodical way—it’s hard, but a few years out, you’re incredibly grateful for it.”**

**Sharadh Sivamani**

Director Canay echoed this sentiment, underscoring the importance of intellectual discomfort and how MMSS intentionally places students in challenging situations that foster growth. Ryan Broll highlighted how students carry these skills forward into graduate study, using their MMSS training to frame research questions and tackle complex problems. Zian Chen shared that despite often being the youngest and least experienced person in boardroom settings, his MMSS background enabled him to contribute meaningfully and speak with confidence. Patricia Tang pointed to her MMSS senior thesis project as a major turning point in her undergraduate education that has continued to provide benefits. She shared how learning to extrapolate insights from limited data has proven to be an especially valuable skill in her MBA studies. Nikola shared he has been very busy in a high-intensity role as a trader but is also enrolled in the deferred MBA program at Kellogg and will be excited for that transition.

young  
alumni



## Panelists



### Evie Berg

**Industry:** Real Estate  
**Company:** Harrison Street  
**Title:** Transactions Analyst  
**Graduation Year:** 2024  
**Majors:** MMSS, Political Science  
[LinkedIn Profile](#)

Evie shared advice to take as many classes as possible—she took a Poli Sci class on public speaking and speech writing that has proven very helpful in her professional experiences; going to office hours is her number one piece of advice for any student—she has learned so much from the faculty from just a short chat after class.



### Sharadh Sivamani

**Industry:** Finance/VC  
**Company:** Millennium  
New Horizons  
**Title:** Investor  
**Graduation Year:** 2020  
**Majors:** MMSS, Econ, CPU  
[LinkedIn Profile](#)

Sharadh's dynamic VC job has never been the same from day to day. He has found his success in his job is actually very thesis based. He's using his research skills from his MMSS thesis daily to respond to the needs of firm.



### Ryan Broll

**Grad School:** 3rd Year  
Economics PhD  
**School:** Princeton University  
**Graduation Year:** 2020  
**Majors:** MMSS, Econ and Math  
[LinkedIn Profile](#)

Ryan echoed the need for soft skills, networking and reminding everyone that rejection is a big part of everyone's career pathway even though you only see people's success trajectories on their LinkedIn profiles.



### Patricia Tang

**Grad School:** 1st Year MBA  
**Company:** The Wharton School  
at University of Pennsylvania  
**Graduation Year:** 2020  
**Majors:** MMSS, Econ and Music  
(Viola Performance)  
[LinkedIn Profile](#)

Patricia advocated for taking a music class! Flexing both sides of your brain is really important and a music class can spark new interests.



### Zian Chen

**Industry:** Consulting –  
Executive Compensation  
**Company:** FW Cook  
**Title:** Consultant  
**Graduation Year:** 2020  
**Majors:** MMSS, Econ, and Math  
[LinkedIn Profile](#)

Zian shared that his role often requires responding to unexpected questions in real time. He emphasized that it's okay not to have a perfect answer immediately, noting the importance of engaging in a dialogue, clarifying what a client or manager is really asking, and being honest when you don't know something yet.



### Nikola Zhang

**Industry:** Finance  
**Company:** UBS Global Markets  
**Title:** Junior Trader  
**Graduation Year:** 2023  
**Majors:** MMSS, Econ, Stats,  
CPU and Medill IMC certificates  
[LinkedIn Profile](#)

Nikola brought us back to basics and reminded students to be mindful of a healthy routine and to get some sleep amidst all the intense work and study schedules!

# MMSS 2025

## Senior Thesis Projects

»»» The senior thesis is the capstone to the MMSS curriculum. It provides students the opportunity to draw upon the skills they have gained in class and apply them to a substantial piece of original research. During their junior year, MMSS students already begin to select a topic and advisor. As seniors, they work to refine their research question, complete any further data collection, and compile their analysis into a cohesive paper. Here are summaries of three research projects from the class of 2025:

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### “Studying the Effects of Model Race in E-Commerce Product Listings”

by Dori Takamatsu

Dori explores how the race of models shown in online product photos shapes what shoppers say they'd buy, how they judge quality, and which items they prefer. In a large, survey-based experiment that mimics a retail site, participants saw the same clothing presented in three ways—no model, only white models, or a mix including models of color—and then reported purchase interest, quality ratings, and ranked choices. The big picture takeaway is reassuringly simple: introducing models of color did not materially change purchase interest or perceived quality, and “no model” often performed well—suggesting style and presentation may matter more than model race for the outcomes studied. Overall, the thesis provides careful, real-world-minded evidence that diversification of listings looks less like a marketing lever and more like a branding choice.

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### “Do Safety Issues Affect Airline Fares? Evidence from the 2024 Boeing 737 Max 9 Grounding”

by Toma Hirose

Toma investigates whether airlines flying the Boeing 737 Max 9 had to lower prices after the 2024 door-plug incident. Using a differences-in-differences design, he found the opposite: average fares on affected airlines, like Alaska and United, rose by about 3.5% compared to rivals. This increase was most significant for the cheapest tickets, which saw a 5.8% jump. The research suggests that the



grounding-induced capacity constraints led airlines to reduce the availability of low-cost seats to preserve space for higher-paying customers. Toma's conclusion is that in modern, revenue-managed markets, public safety scares don't automatically translate to lower ticket prices; instead, pricing power and seat allocation are more influential factors.

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### “Rules at Play: Understanding Wikipedia’s Governance in Practice”

by Sari Eisen

Sari's research examines how Wikipedia uses its community-made rules to manage collaboration. By analyzing talk-page discussions and rule citations, the study found that a small core of policies, particularly those related to neutrality(WP:NPOV) and verifiability (WP:V), are used most frequently. Rule use increases disproportionately as conversations grow, suggesting they serve as coordination devices to manage intense debates. The study also revealed that administrators cite rules more often than other users, indicating an informal hierarchy within the community. The key takeaway is that Wikipedia's governance is a systematic and scalable model, offering insights for other large, decentralized online communities.



# MMSS Senior Graduation Class of 2025

## A Celebration of Achievement and Community

» The Mathematical Methods in the Social Sciences (MMSS) program's seniors were proud participants in Northwestern University's 167th Commencement Weekend. On Friday, June 13, the program hosted a special MMSS reception with friends and family to celebrate these exceptional students and their completion of this rigorous honors program. Beyond awards and accolades, the afternoon offered a meaningful opportunity for students to reconnect with classmates—socializing, sharing experiences, and strengthening friendships—fostering a sense of community and camaraderie.

Director Canay captured the significance of the day with remarks from his graduation speech, reflecting on the unique academic journey of this class: *“For many of you, the last uninterrupted year of school was your sophomore year of high school, with much of what followed taking place over Zoom due to the pandemic. Despite that disruption, you arrived at Northwestern and set an exceptionally high bar for yourselves by choosing MMSS—a decision that reflects real drive, ambition, and intellectual courage. You should be deeply proud of that achievement.”*

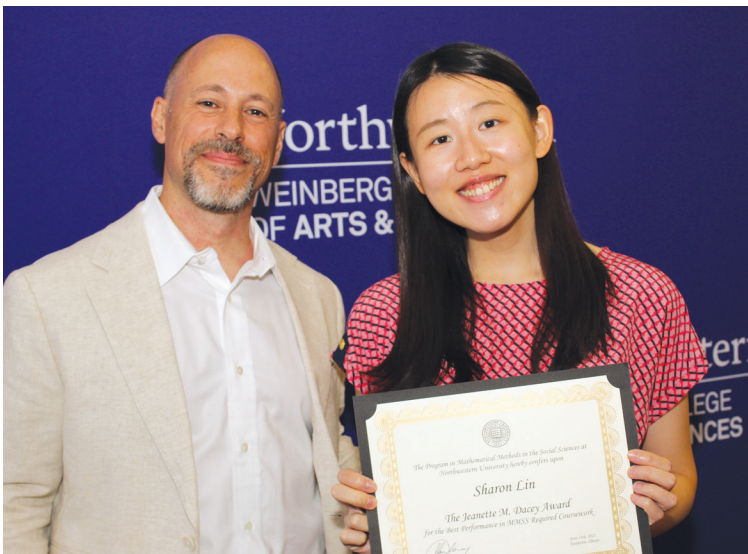
He went on to underscore one of the defining features of the MMSS experience—the senior thesis—adding, **“What makes the MMSS major both special and intense is the senior thesis. This is not simply a final assignment. It is an opportunity to ask your own question, conduct original research, and dive deeply into a topic that genuinely interests you—an experience that mirrors the work of scholars and prepares you for the challenges ahead.”**





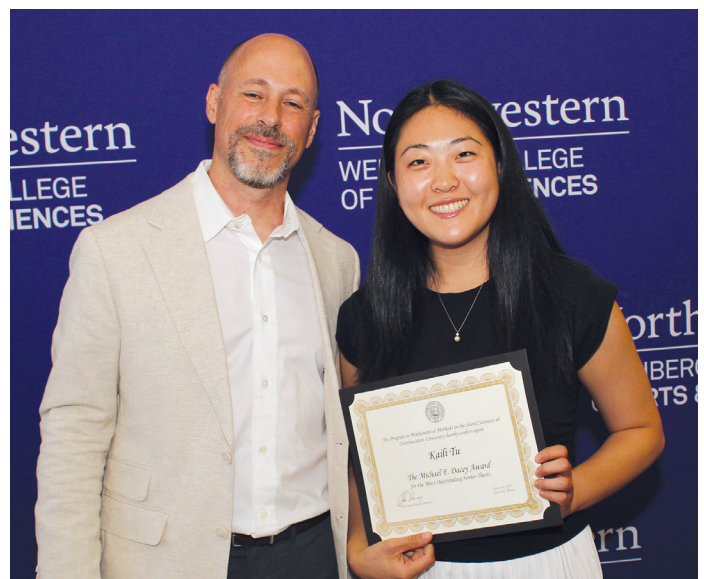
# Jeanette M. Dacey and Michael F. Dacey Awards

**MMSS Professor Michael Dacey** was a geography professor and senior associate dean at the Weinberg College of Arts and Sciences. Dacey founded the successful honors MMSS Program in 1978. In the early 2000s, Dacey and his wife, **Jeanette**, generously contributed a monetary gift to the program. This donation established a **research fund** to support MMSS students as they complete their thesis and coursework. In addition, the Daceys' gift funds **prizes for outstanding student accomplishments**, further fostering excellence within the MMSS community.



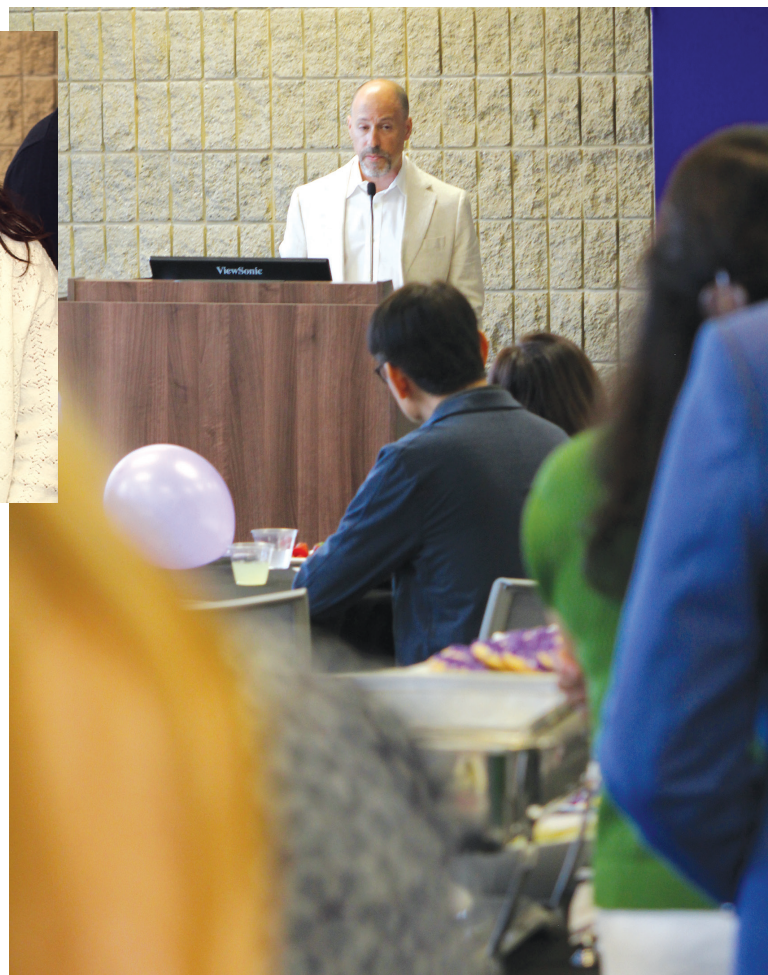
**Left: The Jeanette M. Dacey Prize for the Best Performance in MMSS Required Coursework:**  
Sharon Lin

**Below: The Michael F. Dacey Prize for the Most Outstanding MMSS Senior Thesis:**  
Brett Toban  
Advised by Tracey Scott Wilson  
Kaili Tu  
Advised by Charles Nathanson



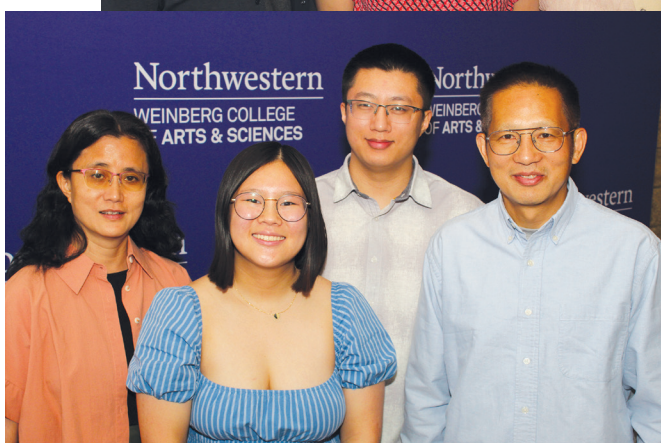
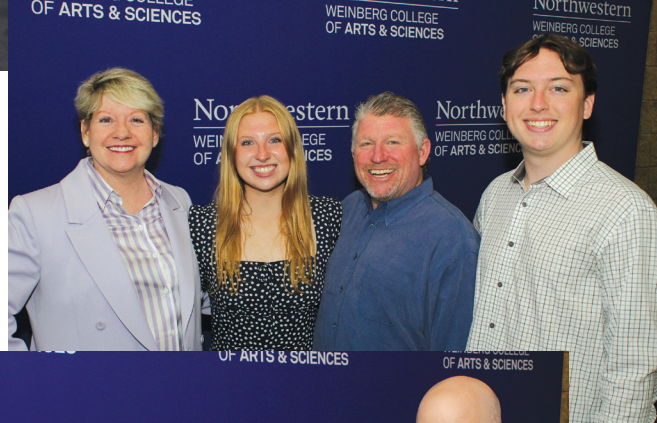


# MMSS Senior Graduation Class of 2025 at the Allen Center



senior  
graduation







# Senior Profiles

## »» Hannah Betron

Class of 2025,  
Analyst, DraftKings



### Why did you apply to MMSS?

I always loved math and numbers, but what was lacking for me in high school was the real-world applications of it. The MMSS program stood out to me immediately because no other school had anything like it. I would be not just learning advanced math from the jump but implementing it in an unmatched interdisciplinary

setting. I was also very intrigued by the program's structure: the requirement to pair MMSS with another major meant every student was expanding their horizons beyond the program, contributing unique perspectives, and courses were designed to be applicable to a wide range of fields depending on our individual interests.

### How has MMSS prepared you for graduation?

From a technical standpoint, MMSS taught me the importance of developing and applying frameworks to be successful in professional settings. I appreciated the program's incorporation of coding languages, too, as this was something I did not get in high school and has proven to be crucial to internships and jobs. However, the greatest value I got out of MMSS was the development of my soft skills: critical thinking, advanced collaboration, and learning how to manage my time in an all-new sense due to the rigor of the program.

### What have you enjoyed the most about MMSS?

This might be a common answer, but the one thing I enjoyed the most—and will miss the most—about MMSS is the people. When you are taking two classes per quarter with such a small cohort for two years, you become a really tight-knit group. There is an “all in this together” aspect that never felt cutthroat or competitive; everyone wanted to help each other and learn from each other. Beyond that, being surrounded by such a high level of intellect challenged me in the best possible way. These people brought the best out of me, and I was always so inspired by the different directions in which they took their MMSS skills outside the program!

## »» Abe Rubin

Class of 2025,  
Fulbright Scholar at the University of Warwick



### Why did you apply to MMSS?

Like a lot of MMSS majors, I came into college knowing I loved math. But at 18 years old, that seemed to mean picking between two extremes: either use math to build things as an engineer or go deep into abstract theory as a math major. Initially, I picked engineering, but with little confidence in my choice. When

I learned about MMSS, I knew I had found the perfect fit. MMSS gave me the opportunity to take on challenging quantitative problems—the kind I had always enjoyed—but with a constant focus on real-world questions and real-world impact.

### How has MMSS prepared you for graduation?

At its core, the MMSS major is about breaking complicated problems into their fundamental parts—and then building a story using data and numbers. Where you choose to apply this skill set is up to you. For me, it was political science. My first experience with Political Science research was in Professor Clipperton's Formal Models in Social Science course my freshman year. It was the first time I saw how powerful the tools we were learning in MMSS could be in explaining how the world works. Three years later, I'm starting my masters in a quantitative political science program in the fall—a path tracing directly back to that class.

### What have you enjoyed the most about MMSS?

MMSS brings together people who are passionate about a multitude of subjects—the only thing we have in common is being part of MMSS. That means you're surrounded by incredibly smart people interested in all sorts of topics. This is perhaps most visible in MMSS thesis projects—in my cohort, topics ranged from finance to housing to baseball to marijuana. Over my four years, I've gotten to know some of these people incredibly well. My problem set partner from sophomore year is someone I remain close with—we regularly share videos and ideas. I know the connections I've made in MMSS will persist long after graduation.

## »»» Lorien Zhao

Class of 2025,  
Associate, Boston Consulting Group



### Why did you apply to MMSS?

I applied to MMSS because my older brother was in the Integrated Science Program (ISP) and spoke so highly about the strong sense of community he experienced. Science was never quite my thing, but I was always drawn to math and social science. When I learned about MMSS, it felt like the perfect counterpart for me. I was excited by the opportunity to be part of a small, tight-knit cohort where collaboration is built into the learning process. Looking back, I was absolutely right about the community; some of my closest friendships at Northwestern formed through MMSS.

### How has MMSS prepared you for graduation?

I'm not sure I'll ever need to run a regression from scratch or prove a theorem in my day-to-day life—and that's okay. What MMSS really taught me was how to think. It pushed me to approach problems, break them down into smaller parts, and figure out a path forward. The coursework was rigorous, and sometimes overwhelming, but it gave me confidence in my ability to work through ambiguity. More than anything, MMSS helped me build a mindset: one that values precision, resilience, and intellectual curiosity. That's something I know I'll carry with me no matter where I go.

### What have you enjoyed the most about MMSS?

The community, without a doubt. MMSS attracts some of the most brilliant and driven people I've ever met, but more importantly, they're also some of the kindest, funniest, and most supportive. I loved laughing with classmates during office hours in the MMSS lounge, where even the hardest problem sets felt a little more manageable when tackled together. It's moments like those that made MMSS more than just a major. It was a group of people I could learn with, grow with, and genuinely enjoy spending time with. That sense of camaraderie is what I'll miss the most.

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**“MMSS brings together people who are passionate about a multitude of subjects—the only thing we have in common is being part of MMSS. That means you're surrounded by incredibly smart people interested in all sorts of topics.”**

MMSS Abe Rubin, Class of 2025

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**“MMSS attracts some of the most brilliant and driven people I've ever met, but more importantly, they're also some of the kindest, funniest, and most supportive. . . . It was a group of people I could learn with, grow with, and genuinely enjoy spending time with. That sense of camaraderie is what I'll miss the most.”**

MMSS Lorien Zhao, Class of 2025

Young  
alumni



# Alumni Resources

## Thank You to Our MMSS Alumni Supporters

» No other undergraduate program in the nation matches the scope, advanced level or degree of integration of social sciences and mathematics. We are thankful for the support that has allowed us to make sure MMSS students are well prepared for the future—whether going on to the graduate school of their choice, being highly sought by Fortune 500 employers, or bringing analytical rigor to traditionally less data-driven fields.

## Donating to MMSS

» Donations from our loyal and generous alumni help ensure that the MMSS Program continues to provide vital resources to our students such as statistical software licenses, periodic replacement of computer hardware, support for senior thesis research, community building events and more. Donations to MMSS have a positive impact on the Program's intention of providing a rigorous learning experience within a supportive and resourceful community.

## Nathan Carl Popkins MMSS Legacy Fund

» In addition to a gift to the MMSS Program, alumni and friends can also direct support to The Nathan Carl Popkins MMSS Legacy Fund. This fund was established in 2018 in honor of late MMSS alum Nathan Carl Popkins '01, who embodied a drive and love for math in all facets of his life. In that spirit, the Popkins Legacy Fund is the first permanently endowed fund exclusively dedicated to enhancing the experience of the MMSS students and building a strong, tight knit community of scholars for years to come.

You can designate gifts directly to MMSS through this secure link:

<https://giving.northwestern.edu/MMSSnews>

Or if you are mailing in a check, please include MMSS or the Nathan Carl Popkins MMSS Legacy Fund on the memo line.

## Stay Connected

Due to the MMSS Program's selectivity, the student body is small by design and the average graduating class is 32 students. Since the first students graduated in 1981, there have been approximately 1,400 MMSS alumni. Here are some key ways this community can all stay connected:

### LinkedIn

With over 900 members in our "MMSS Northwestern Alumni" LinkedIn Group, it can be a great resource for connecting. To join, visit our LinkedIn Group [here](#), email [mmss@northwestern.edu](mailto:mmss@northwestern.edu), or search for "MMSS Northwestern Alumni" on LinkedIn.

### MMSS Mentorships

Sign up to serve as an MMSS mentor through [Northwestern Network Mentorship Program](#).

### Alumni Profiles

Send an update to [mmss@northwestern.edu](mailto:mmss@northwestern.edu) and provide an alumni profile on how MMSS has impacted your life.

### Year In Review

Sign up to receive this annual newsletter by sending an email to [mmss@northwestern.edu](mailto:mmss@northwestern.edu).

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