



Opportunities and Career Planning

Projects, summer programs, internships now
Jobs or graduate school later

Hemanshu Kaul and Robert Ellis, Illinois Tech Applied Mathematics

SIAM@IIT

Options during your undergraduate time

- Disciplinary methods courses
- Electives and free electives
- Projects and project courses
- Tutor/ambassador jobs
- Student Organizations
- Panels and workshops
- Hackathons/pitch competitions/one-time events
- Professional Organizations
- Internships
- Summer Programs
- Research
- Conferences

Projects/Project Courses

- Math 380 Intro to Math Modeling
- IPRO 397/497
- Math 497 [Problem-Solving Projects in Business, Government, and Industry](#) (Soon to be DS 480 Data Science Projects)
- [SoReMo Fellows program](#)
- [Elevate summer projects courses](#) (“SCI” courses)
- [Chi Hack Night](#), civic hacktivists
- [MCM/ICM](#) math modeling competition (Jan/Feb)
- Self-directed projects

Internships and Research Experiences

A comprehensive list on our department webpage at [Applied Math Internships](#).

National Labs Argonne National Laboratory (& Oak Ridge/Livermore/Los Alamos/Fermilab), Nevada National Security Site (NNSS)

Federal Programs [Federal Internship Finder](#), Department of Energy (DOE), [Coding it Forward](#), National Security Agency (NSA), National Research Council (NRC), [Naval Research Enterprise Internship Program](#) (NREIP), Congressional Budget Office

University-Based [A combined list of Univ based REUs](#), [American Mathematical Society \(AMS\)](#), Johns Hopkins, [Michigan Big Data Summer Institute](#), UCLA [IPAM](#), National Science Foundation (NSF)

Corporate Programs e.g., IBM, Google

Local Internships [1871 Intern Fair](#), [Museum of Science and Industry](#), Chicago-area companies (e.g., Hub Group), Illinois Tech Career Services connections

Deadlines range from October to February.

Research at Illinois Tech

- [Elevate](#) summer research courses
- Applied Math [SURE summer program](#)
- [SoReMo](#) fall/spring Fellows program
- Computer Science [BigDataX summer program](#)
- Participation in [department seminars](#)
- Undergraduate research with faculty
- Positions assisting faculty/national-lab collaborations (Argonne)

Summer Programs

- NSF [Research Experiences for Undergraduates](#) (REU) programs
- SIAM [Simons undergrad Summer Research Program](#)
- University of Michigan [Big Data Institute](#)

From MAA website:

- [National Research Experience for Undergraduates Program](#) (Promotes participation by underrepresented groups)
- [Summer@BSME](#) – 6 weeks in Budapest for future HS teachers
- [Summer Program for Women in Mathematics](#) – 5 weeks @GWUniv for women after junior year of college considering graduate work
- [Summer Undergraduate Applied Mathematics Institute](#) – 7 weeks learning/research at Center for Nonlinear Analysis, Carnegie Mellon
- [Summer Programs for Undergraduate Research \(SPUR\) at UCLA](#)

Summer Programs, Continued

- [Park City Math Institute Summer Program for Undergraduates](#) - A 3-week summer program where students learn about an advanced topic and work on an individual project.
- [Research in Industrial Projects for Students \(RIPS\) Summer Program](#) - This program involves applied mathematics problems from industry.
- [University of Nebraska Summer IMMERSE Program](#) - A six-week summer program to help prepare students who are about to enter graduate school in mathematics.
- [EDGE Summer Program for Women](#) - For women who are entering graduate school or who have completed one year of graduate studies.
- [Other opportunities](#) - An excellent source of summer programs and other opportunities can be found at the AWM's site.

Academic Year Programs

- [Budapest Semester in Math](#) - A 15-week mathematics study abroad program in Budapest, Hungary. Students take mathematics classes taught in English.
- [Budapest Semester in Mathematics Education](#) - A 15-week long study abroad program in Budapest for undergraduate students interested in the learning and teaching of secondary mathematics.
- [Junior Year for Women at Smith College](#) - For women in the junior year to attend Smith College to get intensive training in mathematics while building the skills and confidence needed to succeed in graduate school mathematics.
- [Penn State's MASS \(Mathematics Advanced Study Semesters\) Program](#) - A fall semester at Penn State with advanced courses and beginning research.

Contests and Conferences

- December (First Saturday in-person at IIT): [Putnam Exam](#)
- January (in-person different cities): [AMS Joint Meetings](#)
- January/Feb (Lincoln): [Nebraska Conference for Women in Mathematics](#)
- Februaury (online) MCM/ICM COMAP [Modeling contest](#)
- March (in person different IL univs): [ISMAA Conference](#)
Problem-solving contest, best paper
- March/April [Menger Day](#), Applied Math Dept., IIT
- April (in-person Chicago): [Chicago-Area Undergraduate Research Symposium](#) (CAURS)
- July/August (in-person different cities): [MAA MathFest](#)
- August & April: Poster competitions at College and University level, IIT

Student Organizations

Most active:

- [SIAM Student Chapter](#) (Society for Industrial and Applied Mathematics)
- [WiSTEM](#) (Women in Stem)
- Machine Learning Club
- ACM/ACM-W Chapters (Association for Computing Machinery/ACM-Women; contact Prof. Cindy Hood)

- ASA Chapter (American Statistical Association)
- AWM Student Chapter (Association for Women in Mathematics)

Professional Organizations

- <http://www.siam.org/> (Society for Industrial and Applied Mathematics)
- <http://www.ams.org/> (American Mathematical Society)
- <http://www.maa.org/> (Mathematical Association of America)
- <http://www.awm-math.org/> (Association for Women in Mathematics)
- <http://www.amstat.org/> (American Statistical Association)
- <http://www.acm.org/> (Association for Computing Machinery)
- <http://www.soa.org/> (Society of Actuaries)
- <http://www.informs.org/> (Institute for Operations Research and the Management Sciences)
- <http://www.ieee.org/> (Institute of Electrical and Electronics Engineers)
- <http://www.nctm.org/> (National Council of Teachers of Mathematics)



Students:
Resources,
scholarships,
reduced
memberships &
conference
registrations

Career Services Links

Resume Guide, Cover Letter Guide, Resume Template, LinkedIn Guide

Recording:

<https://drive.google.com/file/d/1fC5LdTUbl86eGTNTSiQeT11cSdRLFPnz/view?usp=sharing>

The Bridge: <https://iit.wisr.io/login>

LinkedIn: [linkedin.com](https://www.linkedin.com)

Handshake: iit.joinhandshake.com

VMock: vmock.com/iit

Needs to be updated!

Good web resources

- American Mathematical Society (AMS) page for undergraduates
- Mathematical Association of America (MAA) page for undergraduates
- Society for Industrial and Applied Mathematics (SIAM) page for undergraduates

The AMS page for students:

- ▶ Explore Math Programs
- ▶ Find out about Graduate School
- ▶ Enter Competitions & Earn Awards
- ▶ Publish or Present Research
- ▶ See Where Math is Used
- ▶ Find Internships, Fellowships & Jobs
- ▶ Get Free Math Help
- ▶ Enjoy Math Outside the Classroom!

Math Hawk – Rena Haswah

Data scientist at Farmer's Fridge

Rena Haswah – My Hawk Flight



Rena Haswah

Major: Applied Mathematics
Hometown: Chicago, Illinois

Minor: Artificial Intelligence (AI)
Graduation Year: Fall 2019

I'm Rena. Over the summer, I play volleyball on the beach. I have many interests, most of them in STEM applications, but I also have passion for fashion and makeup. If I had more time, I would cook, travel, and try to experience as many cultures and people as possible.

I started with a major in neuroscience, then I switched to English, and I believed that I'd go to law school eventually. I thought I'd really have to change the way I thought about the world if I was going to be any good at reasoning. I couldn't help but feel that I shouldn't have to choose one subject to focus on in college, but then I found Applied Math.

Now, I am able to dabble in many STEM areas, the humanities, and the arts. It makes me feel content to have a discipline that I can apply to any big problem that I feel like jumping into. Whether that problem is tomorrow or in ten years, whether I work on particle astrophysics or computational neuroscience, my pursuit of mathematics has been my single best decision in life. With mathematics, I can be my most creative self.



Math Electives
Statistics, Graph Theory,
Mathematical Modeling, Abstract
Algebra, Topology, Combinatorics

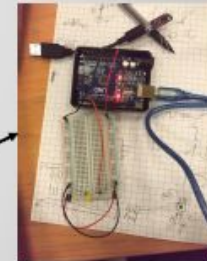
Computer Science Electives
Programming in MATLAB,
Accelerated Introduction to Computer
Science, Data Structures and
Algorithms, Introduction to
Algorithms, Data Mining, Database
Organization, Artificial Intelligence



Student Organizations
President of Machine Learning @ Illinois Tech
(ML@IIT), member of the Illinois Tech chapters of
the Association for Women in Mathematics (AWM)
and the Society for Industrial and Applied
Mathematics (SIAM)

Project: SIR for Ebola
I created two models (one discrete, one continuous) for analysis of an epidemic's growth/decay, approximated transmission rate and length of infection using relevant data, found dosage equilibrium, optimized delivery routes, and coded in MATLAB/Mathematica

IPROs
Product Design (Fall 2018)
Big Data Analytics for Emergency Response (Spring 2019)



What matters most to you about the department or the Illinois Tech community?

Illinois Tech is a place where learning really thrives. My peers inspire and support me to do really great things. Most times, I can simply look around me to find a student that can explain the basics of mechanical physics. I regularly encounter students who have engineered things such as a self driving robot or an aircraft. I am grateful to have been part of a campus that really fosters education and knowledge application so much. The innovation spirit of the school really is contagious.

Possible Plans for the Future

M.S. Data Science

Ph.D. in Applied Math

Freelance consulting/
problem solving

Work as a data scientist to
help people make inferences
from observations in their
environment

Math Hawk – Parker Joncus

Senior Software engineer, Simplify Healthcare

Parker Joncus – My Hawk Flight



Extracurricular Activities
Men's Basketball, student worker at Keating Sports Center, recreational sports supervisor



Parker Joncus

Major: B.S. Applied Mathematics / Master of Data Science
Hometown: Damascus, Oregon

Minor: Computer Science
Graduation Year: 2019

I am a pretty busy student. I play on the Men's Basketball team as well as take a full course load. I have always loved math and solving problems. Math really is the backbone of pretty much anything, so if you are good at math, it is not too hard to get good at engineering or other disciplines. I took a computer science course my freshman year and learned to code a little bit, and I instantly fell in love with the combination of mathematics and computer science; data science is the perfect storm of the two.

Within basketball, I was part of the first recruitment class that turned the program from being a 2-23 team to having winning seasons for three years in a row, as well as making an appearance in the post season for those three seasons. I also worked at a bungee jump/zip line site in high school, and that was pretty fun.



What matters most to you about the department or the Illinois Tech community?
The department and community are very involved and friendly. There are guest speakers every week from outside Illinois Tech, and there are events such as tea time that allow professors and students to get together and casually have a conversation.

Math Electives
Introduction to Mathematical Finance, Applied Algebra, Mathematical Modeling, Linear Optimization, Computational Mathematics (graduate level), Number Theory, Problem-Solving Projects in Business, Government, and Industry

Computer Science Electives
Data Structures and Algorithms, Introduction to Algorithms, Data Mining, Database Organization, Topics in Computer Science

Student Organizations
Vice President of the Association for Women in Mathematics (AWM), member of Math Club and Machine Learning @ Illinois Tech (ML@IIT)

Projects

I have worked on many different projects throughout my time at Illinois Tech:

- I created code that will generate a sudoku puzzle based on the desired difficulty.
- I studied and recreated the stable marriage problem.
- I used data analysis techniques to determine which areas of campus are more likely to see crime given a certain day and time from the school's public safety data.
- I created regression models to predict the outcomes of future Olympic running events and to determine if there is some limit and what that limit is.

I have a lot of other projects that I have worked on, and they can all be read about on my personal website: <https://www.parkerjoncus.com>

IPOs
User-Centered Design
American Red Cross Data Science Project

Research

- Applied algebra (summer 2017): We wrote documentation, test cases, and examples for different methods in a coding language called Maculay2. We then submitted the package; it is published for anyone to use.
- Computer science (summer 2018): We prepared for the Student Cluster Competition that is held in November where 16 teams compete with a cluster to see who can run certain applications the fastest.



Plans for the Future
I want to go into industry at least for a while and possibly go for a Ph.D. later in my career. I will be working as a software developer at Epic after graduation up in Madison, WI.

ILLINOIS INSTITUTE OF TECHNOLOGY

DEPARTMENT OF APPLIED MATHEMATICS

Math Hawk – Adriana Cortes

Release Assurance Associate, Mastery Logistics Systems

Adriana Cortes – My Hawk Flight



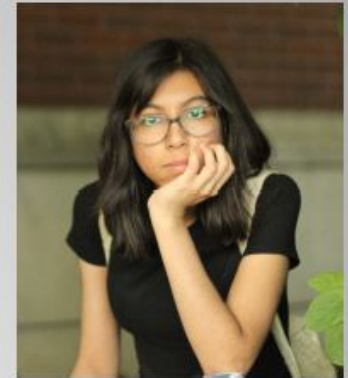
Adriana Cortes

Major: Applied Mathematics
Hometown: Chicago, Illinois

Minor: Psychology
Graduation Year: Spring 2020

My name is Adriana. I'm currently working as the grader for MATH 122, Introduction to Calculus. I co-founded Illinois Tech's chapter of the Association for Women in Mathematics back in Spring 2017 as the treasurer. I'm no longer on the executive board, but I'm glad to see that the organization is still running and doing great events for Illinois Tech.

I have a variety of interests, and applied math gives me the flexibility to go into any career path I want. My academic interests include discrete math, group theory, topology, and abnormal psychology. A few of my interests outside of school include video games, hip-hop, and fashion.



Math Electives

Statistics, Number Theory, Introduction to Stochastic Processes, Combinatorics, Topology, Graph Theory

IPRO

User-Centered Product Design
Innovation Workshop

Student Organizations

Co-founder of the Association for Women in Mathematics (AWM), Events Coordinator of Machine Learning @ Illinois Tech (ML@ITT)

Study Abroad: Cork, Ireland (Fall 2018)

Due to scheduling conflicts, I was not able to take any math courses there. I ended up taking an introductory economics course, Work Psychology, Evolutionary Psychology, and an Introductory Irish History course. I would highly suggest studying abroad if you have the opportunity.

Psychology Electives

Abnormal Psychology, Work Psychology, Evolutionary Psychology

Internship: Market Analysis and Planning Intern for Hub Group (Summer 2018)

I analyzed data essential for evaluating company growth. I looked at the historical data from previous years and compared it to the current data; this process helped other teams look into forecasting for future seasons. I also aided in weekly tasks essential for data collection. This internship allowed me to improve my Excel skills, and I learned how to use SQL.

What matters most to you about the department or the Illinois Tech community?

Most professors here are very approachable, which makes it easy for me to seek help when I need it. I also like how helpful and encouraging the math professors are.



Plans for the Future

I'm thinking of going straight to work right after graduating. However, the idea of going to graduate school has come across my mind a few times.

ILLINOIS INSTITUTE OF TECHNOLOGY

DEPARTMENT OF APPLIED MATHEMATICS

Math Hawk – Margaret Hoeller

Mathematics PhD Candidate, Univ. Illinois–Chicago

Margaret Hoeller – My Hawk Flight



Student Organizations and Activities
Co-founder of the Association for Women in Mathematics (AWM), member of the Lacrosse team, Rock Climbing Club, Acapella
I joined the Rock Climbing Club freshman year after not climbing anything but trees and became club president my sophomore year. It has been so rewarding to expose more students to the sport.



Margaret (Mimi) Hoeller

Major: Applied Mathematics
Hometown: Tinley Park, Illinois

Minor: Biology
Graduation Year: Spring 2019

My name is Mimi. While at Illinois Tech, I fell in love with research and am interning at the Nevada National Security Site (NNSS) on a nuclear nonproliferation research project. When I wasn't studying, I played lacrosse, went rock climbing, and helped start the Illinois Tech student chapter of the Association for Women in Mathematics (AWM).

My academic interests include statistics, data science, and mathematical biology. I found math very challenging throughout high school, but when I reached calculus, I really enjoyed it. No matter how long it took for me to understand a concept, I had no trouble engaging with it until I figured it out. The past four years have only reinforced this.



Math Electives
Fourier Series and Boundary Value Problems, Computational Methods for Ordinary Differential Equations, Regression, Stochastics, Complex Analysis, Linear Optimization, Abstract Algebra

Biology Electives
Genetics, Cell Biology, Human Physiology, Biology Colloquium, Bioinformatics

Projects

In my Introduction to Math Modeling course, I helped create a model for predicting the home base of a serial killer. In my Regression course, I helped make a predictive model for Olympic track and field times. For the 2017 Mathematical Contest in Modeling, I helped make a model of skywaves.

Internship: Ryerson Metals (Fall 2018)

I laid the groundwork for a linear optimization decision model for product logistics.

Research

I briefly worked with Professor Jean-Francois Pombert on a bioinformatics project in the summer of 2017. I processed genetic data and generated Hidden Markov-based models of protein evolution and queried them against known proteins looking for homologs. I am continuing the work I started that summer on indirect physical sensing at the NNSS.

Internship: Nevada National Security Site (Spring 2019)

- I work for the semiautonomous contractor to the Department of Energy (DOE) whose responsibility is to steward the NNSS.
- When a national lab wants to experiment with nuclear materials, the NNSS may be one of the only locations where that is possible, and all data and equipment is owned by the contractor.
- The contractor is able to submit employee-driven research projects that are relevant to the National Nuclear Security Administration missions.
- I am working on one such project under Dr. Aaron Luttmann, which supports the defense nuclear nonproliferation mission by analyzing (and hopefully) classifying activity around nuclear experiments.

Plans for the Future

Work at the NNSS for a year

Go to grad school for a Ph.D. in applied mathematics

What matters most to you about the department or the Illinois Tech community?

How involved the professors are. I genuinely felt that they cared about the academic success of the students. I knew if I needed help or wanted to talk about ideas that they were open to it.

ILLINOIS INSTITUTE OF TECHNOLOGY

DEPARTMENT OF APPLIED MATHEMATICS

Math Hawk – Joanna Czopek

High School Math Teacher – Kenney High School (Chicagoland)

Joanna Czopek – My Hawk Flight



Joanna Czopek

Hometown: Chicago, Illinois
Major: Applied Mathematics

Graduation Year: Fall 2019
Minor: STEM Education

Hi! My name is Joanna Czopek and, as of Fall of 2019, I completed my undergraduate degree within 3.5 years. During my time at the university, I was a member of Machine Learning @ Illinois Tech (ML@IIT) and the Association for Women in Mathematics (AWM). AWM assists members in dealing with the stigma and the undermining of the capabilities of women in STEM, and it provides resources and a safe space for enhancing our experiences and intellectual growth.

I love the mathematical field, and I am interested in Mathematical Finance, especially Mathematical Modeling. I have worked in a variety of fields, ranging from being a waitress at a local Polish restaurant, serving customers as a currency exchange teller, and even being a sales clerk at a bakery. However, the most valuable working experience had to be my Student Teaching Internship. All of these experiences, both personal and academic, have shaped the person I am today. They have helped me become the teacher that I am. That being said, since the beginning of January 2020, I have been teaching at a high school in the Midway area, and based on the progress I've made, I couldn't be happier.



Student Organizations
Events Coordinator of the Association for Women in Mathematics (AWM),
Education Chair of Machine Learning @ Illinois Tech (ML@IIT)

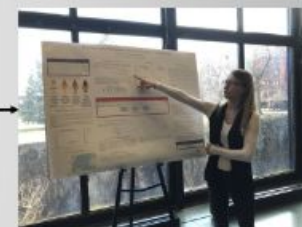


Math Electives

Mathematical Modeling, Regression, Computational Algebraic Geometry, Combinatorics, Numerical Linear Algebra, Case Studies and Project Design; Insurance Risk and Stock Analyses

Project: The Transmission of the Ebola Virus

I created various discrete and continuous models, especially making use of discrete dynamical systems for analysis of an epidemic's growth over countries of Africa in 2014. I was able to approximate the transmission rate, length of infection, the dosage equilibrium of a theoretical cure, optimized delivery routes, and was able to portray the results and simulations through code in MATLAB/Mathematica.



STEM Education Electives

Analysis of Classrooms, Middle and Secondary Curriculum/Foundations, Instructional Methods/Strategies, Inquiry and Problem Solving, Advanced Methods for Inclusive Instruction & Practicum

Student Teaching Internship

I worked with two mentor teachers to plan lessons with heavy emphasis on differentiation to enhance the learning of individuals as well as engagement in the classroom and with the material.

- Created more hands-on activities that the students could engage in.
- Developed instructional materials and plans that are consistent with current cognitive and social theories on student development, which allowed differentiation for student needs as well as flexibility between teaching styles.
- Implemented useful strategies in the mathematics classroom, including 3 reads, creating a diagram, logical reasoning, finding a pattern, and working backwards to meet student needs.

Golden Apple Scholar

- Participated in 500 hours of classroom experience and instruction across various school settings in Chicago, Illinois including DePaul University and St. Xavier University.
- Engaged in pre-teaching seminars addressing concepts such as balanced literacy instruction, inquiry-based learning, cultural competency, growth mindset, as well as civic engagement and professional expectations.
- Took part in collaborative learning and co-teaching to enhance the learning experience for students, from planning and preparation to managing the classroom environment, as well as professional responsibilities.
- Interacted with students and peers, creating and implementing ideas to promote classroom culture.

What do you like about mathematics, and what matters most to you about the math department?

Mathematics is universal language. People all over the world are able to communicate through mathematics, unlocking the most interesting aspects of our world. I truly enjoy topics such as Combinatorics and Mathematical Modeling. It is amazing what we can portray to others, using mathematics. For example, how will a new flu outbreak effect the US? Mathematicians hold the answers in simulations and models that can help us predict and possibly reach a future favorable outcome!

Also, the math department itself department is one of a kind. What other department meets for cookies, tea, and a chat (usually about mathematics, occasionally about other things we are up to) once a week?! Everyone is very supportive of your aspirations, and it is amazing to be surrounded by people who think like you.

Plans for the Future

My plan for now is to teach. It is currently where I am happy. However, I aspire to further my education, working towards my master's degree. That is seen in my near future. As of now, I plan to live my life to the fullest, travelling at every occasion that I get.



Your Questions?

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