WINTER 2021

DEPAUL CENTER FOR DATA SCIENCE

DePaul | COLLEGE OF COMPUTING AND DIGITAL MEDIA

Faculty and Students News

- Dr. Bamshad Mobasher received a DePaul Academic Initiative Pool Summer Research grant of $5,000 from 2020-2021 on the topic Power of the Few: Analyzing the Impact of influential Users in Collaborative Recommender Systems.

- Dr. Thiruvarangan Ramaraj received a DePaul Academic Innovation and Growth (AGIF) grant of $100,000 for three years on the Computational Biology and Applied Bioinformatics (CoBaAB) Lab.

- Dr. Alexander Rasin received a DePaul Academic Innovation and Growth (AGIF) grant of $23,179 for one year on the topic Interactive and Integrated Radiological Image Search (IRIS).

- The graduate assistant of CDS, Hao Wu, presented the Center's project — Using Bayesian Improved Surname Geocoding Method to Impute the Missing Race/Ethnicity in the Chicago Department of Public Health COVID-19 – at the virtual Health Equity & Social Justice Conference on Friday, November 6th, 2020.

- Bhooma Shivakumar, a graduate student in Data Science at DePaul University, has become a finalist at the Student Data Challenge on Urban Travel Time, Speed, and Reliability organized by the National Academies of Sciences, Engineering, and Medicine — Transportation Research Board (TRB) Joint Subcommittee on Travel Time, Speed, and Reliability. In this project, Bhooma and her advisor Dr. Ilyas Ustun analyzed the effect that COVID-19 has had on driving behavior in Austin, Texas. The project will be presented at the 100th Annual Meeting of TRB to be held virtually on January 26th, 2021.

New Publications

- M Mansoury, R Burke, B Mobasher. Flatter is better: Percentile Transformations for Recommender Systems. Under review: ACM Transaction on Interactive Intelligent Systems. 2020

- D Jannach, B Mobasher, S Berkovsky. Research directions in session-based and sequential recommendation. User Modeling and User-Adapted Interaction: The Journal of Personalization Research. 30 (4), 609-616, 2020

- M Mansoury, H Abdollahpouri, M Pechenizkiy, B Mobasher, R Burke. Feedback Loop and Bias Amplification in Recommender Systems. Proceedings of the 29th ACM International Conference on Information and Knowledge Management (CIKM 2020). October 2020

- H Abdollahpouri, M Mansoury, R Burke, B Mobasher. The Connection Between Popularity Bias, Fairness, and Calibration in Recommendation. Proceedings of the 14th ACM Recommender Systems Conference (RecSys 2020). September 2020

Business Analytics

- **Analyzing Trade and Operational Trends of Businesses**

  Description: Fortune 500 companies typically have multi-national operations that require the shipping of goods across international boundaries. Such shipping is essential for global trade but has impacts on energy consumption and emissions. By analyzing these companies and their trade patterns, we are able to assess the company's impacts in these areas. We are also able to conduct scenario analyses to forecast trade and shipping decisions in the future. However, while various data sources are available regarding total domestic and international trade volumes, there is a gap in company-specific data. The goal of this project is to develop company-specific trade data and to visualize insights using the data. This is a joint project between DePaul University and Argonne National Laboratory.

- **Emerging Trends in Food Delivery**

  Description: COVID has dramatically impacted how people shop. There is more e-commerce activity now than ever before. The goal of this work is to develop a quantitative understanding of how COVID has impacted last-mile delivery in urban areas — how much more activity is there, what are the traffic patterns that result from this activity in different areas of the city? The work should focus on Chicago, and it should focus on either change in (1) delivery services from large parcel carriers, including UPS, FedEx, and Amazon; or (2) delivery service by contractors — people like you and me who are picking up groceries, food or other items and delivering these goods to homes (e.g., GrubHub, Instacart, and others). #2 is preferred. This is a joint project between DePaul University and Argonne National Laboratory.

- **Changes in Trucking Fleets Over Time**

  Description: The Federal Motor Carrier Safety Administration (FMCSA) is the agency of the Department of Transportation (DOT) responsible for monitoring and developing safety standards for commercial motor vehicles operating in interstate commerce. The Motor Carrier Management Information System (MCMIS) is a computerized system whereby the FMCSA maintains a comprehensive record of the safety performance of the motor carriers (truck and bus) and hazardous materials shippers who are subject to the Federal Motor Carrier Safety Regulations (FMCSR) or Hazardous Materials Regulations (HMR). This is a joint project between DePaul University and Argonne National Laboratory.

Transportation Analytics

- **Transportation Data Analytics**

  Description: This research area includes analyzing how people move from point A to point B. This can include congestion and speed on the transportation networks, how traffic patterns change over time, how short-term or long-term events affect these changes (construction, large social gatherings, the addition of new roads or public transport, etc.), choice of transportation mode, large external factors such as Covid-19 impacting the transportation, etc. Transportation analytics can be combined with other data sources such as demographic, social, health, economic, employment, and more to make the analysis richer and more meaningful.

  Transportation analytics is an area rich in data visualization, geospatial analysis, and time series analysis. Other possibilities include Deep Learning application in connected and autonomous vehicles, safe driving analysis (safety belt, distracted driving, etc.), bike transport and bike infrastructure, road safety and vehicle crash analysis, etc.

Image Analysis and Classification

- **Species Classification in Images from Motion Triggered Cameras**

  Description: This project focuses on developing models that will be able to detect animals in images and identify the species. Since 2010, Lincoln Zoo researchers have set up motion-trigged cameras four times per year (spring, summer, fall, and winter) for 28 consecutive days at roughly 100 sites (city parks, cemeteries, golf courses, and forest preserves). These sites fall along a gradient of urbanization and range from downtown Chicago to about 23 miles outside of the city. They use these data to understand where species prefer to live in Chicago and to determine how urban land cover influences the species choices. However, the rate at which the data is collected far surpasses the rate at which they are labeled, and to date, there is a huge backlog of unlabeled images. Thus, automated machine learning ad deep learning models are needed to minimize the need for a human to label the images.

For any of these projects, interested students can contact Dr. Ilyas Ustun at iustun@depaul.edu

MORE INFO: 🌐 HTTPS://CDS.CDM.DEPAUL.EDU/PROJECTS

DEPAUL CENTER FOR DATA SCIENCE

ALUMNI PANEL

2021

This panel with featured alumni from the DePaul Data Science Program provides guidance to students by sharing their educational experiences at DePaul, as well as how they built a career path that led them to the successful positions they currently have. Students and faculty members affiliated with the Data Science Center will be participating in the event.

• • • • •

FEBRUARY 19, FRIDAY 4:00 PM TO 5:30 PM CST
VIRTUAL EVENT

Meet Alumni

AAREN STUBBERFIELD

Manager of Data Governance and AI at Ingredion Incorporated

KE FENG

Data Scientist at Aon

LAURA FLOYD

Marketing Science Partner at Facebook

TAIHUA (RAY) LI

Data Scientist at AWS

RSVP: https://forms.gle/J6JQAssxm6uTANQo6

More Info: DSC@DEPAUL.EDU
HTTP://CDS.CDM.DEPAUL.EDU

FALL ACTIVITY

Research Showcase Event

The CDS Research Showcase event was successfully hosted on November 9, 2020. Five projects were presented by our students. Over 40 students and faculty joined this virtual event. You can find the recorded video of this event at:
https://youtu.be/GBJ2sRe6o80
If you are interested in any of the projects, please do not hesitate to contact the professor or the CDS at dsc@depaul.edu. For more projects, please see our website at https://cds.cdm.depaul.edu/projects/.

01

COMPUTER-AIDED PROGNOSIS OF AGE-RELATED MACULAR DEGENERATION

Speakers:
- Yiyang (Ian) Wang, PhD. Computer Science Student
- Hao Wu, MS Data Science Student

Professor: Dr. Daniela Raicu

02

COVID-19 BIOMARKER DETECTION IN CHEST X-RAYS

Speaker: Mirtha Lucas, PhD. Computer Science Student
Professor: Dr. Daniela Raicu

03

DOES THE USER HAVE A THEORY OF THE RECOMMENDER?

Speaker: Muheeb Faizan Ghori, PhD. Computer Science Student
Professor: Dr. Jonathan Gemmell

04

THE IMPACT OF COVID-19 ON TRANSPORTATION IN AUSTIN, TEXAS

Speaker: Bhooma Shivakumar, MS Data Science Student
Professor: Dr. Ilyas Ustun

05

ANALYZING COVID-19'S IMPACT ON MELBOURNE, AUSTRALIA'S TRANSPORTATION NETWORK

Speaker: Jennifer Franks, MS Data Science Student
Professor: Dr. Ilyas Ustun

STUDENT GROUP

DePaul Data Science Group (DDSG)

The DePaul Data Science Group serves students with an interest in data science and analytics. Our goal is to support success in the program and in the job search process by:
- Connecting DS students with industry professionals, alumni & faculty
- Providing advice about the program
- Providing supplemental skills training
- Providing job search preparation information unique to data science & analytics

We do this by organizing:
- Workshops & skills training
- Company presentations
- Panel discussions with data scientists & analytics professionals
- Social events & Networking
- Hackathons

New Board Members

Professional: Currently, Seth serves as a Vice President for Northern Trust Corporation. He is responsible for business services including governance, reporting and analytics for Corporate & Institutional Services-Asset Servicing. He also has a passion for technical product development, graphics-based data analytics, and process optimization.
E-mail: sdowling@depaul.edu
LinkedIn: https://www.linkedin.com/in/sethrdowling/

Seth R. Dowling
Co-President

Professional: Pramathesh is pursuing his MS degree in Data Science with concentration in computational methods. He pursued his bachelor's degree in Information Technology from Gujarat Technological University. He was working as a software developer in JVD Machines, Ahmedabad, Gujarat for 1 year. After that he decided to gain more knowledge and make a good career as a data scientist, so he left his job and started studying again.
E-mail: pramatheshshukla05@gmail.com
LinkedIn: https://www.linkedin.com/in/pramathesh-shukla-1044051b2/

Pramathesh B Shukla
Co-President

Professional: Raquel will be an IT Consultant at Microsoft, starting in Fall 2021. She recently graduated from DePaul University with a bachelor's degree in Finance. Now, she is pursuing her master's degree in Data Science in computational methods. As a member of the student board committee, her mission is to empower other students by building connections with other students, professors, and panelists through the events hosted. She sees this as an opportunity to grow within the tech field, and help others grow as well.
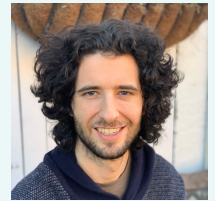**E-mail:** raquelcadenap@gmail.com
LinkedIn: https://www.linkedin.com/in/raquelcadenap/

Raquel Cadena
Event Manager

STUDENT GROUP

Professional: Tyler graduated from Indiana University with a bachelor's degree in Economics, an honors certificate through the Liberal Arts and Management Program, and a minor in political science. After graduation, Tyler served one year as assistant controller for his family's restaurant businesses before moving to New York City to become a data analyst at a PR firm. Tyler moved back to Chicago after two years in New York to become the controller of his family's businesses. To prepare for the role, Tyler enrolled in the CFA and is currently awaiting to take the level three CFA exam. Tyler looks forward to contributing his financial knowledge and experience as a controller to serve the community at DePaul through the Data Science student group. Tyler hopes to find further opportunities to support his communities by applying his data science skills as well.

E-mail: tlboudart@gmail.com   **LinkedIn:** https://www.linkedin.com/in/boudart/

Tyler Boudart
Treasurer

Professional: Currently, Maggie is a Product Analytics Manager with Egencia, the business travel platform of Expedia Group. She is responsible for analyzing product features that can improve conversion rates or improve the user experience. She is also involved with the Business Volunteers for the Arts program with the Arts & Business Council of Chicago. Maggie received a Bachelor of Arts in Communication from Loyola University Chicago and is currently a Master of Science candidate in Data Science with a focus on Computational Methods from the DePaul University School of Computing and Digital Media.

E-mail: mwolff7@depaul.edu   **LinkedIn:** https://www.linkedin.com/in/magwolff/

Maggie Wolff
Social Media

Professional: Danyah is currently a third year undergraduate student at DePaul University where she is pursuing a major in Data Science and a minor in Computer Science and Statistics. She also has a passion for machine learning and AI and hopes to continue developing her interests further. As a member of the Data Science Group, Danyah wants to encourage students to take part in events and social activities to learn more about data science and also to make connections with each other. She hopes to get students involved and take part in events and networking. The Data Science Group is perfect for students who are looking for a community of individuals with similar interests rooted in data.

E-mail: danyahkhan17@gmail.com   **LinkedIn:** https://www.linkedin.com/in/danyah-khan/

Danyah Khan
Social Media

Professional: Dawei received a Bachelor of Engineering in Bioengineering in China and a Master of Science in Cellular and Molecular Biology at the Illinois Institute of Technology. He is currently enrolled in MS in Data Science at DePaul University and will become a graduate assistant tutor at CDM in Jan 2021. He commits himself to seek students' needs and combine them with any available help from experienced people. Making real change is what Dawei is interested in most, and he figured that the Data Science Group is a great way to make contributions.

E-mail: dwang55@depaul.edu   **LinkedIn:** https://www.linkedin.com/in/daweiwang216

Dawei Wang
Liaison (Industry /Career/Alumni)

Professional: Hima worked as a Senior Associate in Wipro. She was responsible in identifying and analyzing fraudulent money transactions in the one of the online payment apps. She received a bachelor's degree in Mechanical Engineering in India and is currently pursuing her master's in Data Science in computational methods.

Hima Barla
Inclusion & Diversity

More Info: ⊕ HTTPS://CDS.CDM.DEPAUL.EDU/DATA-SCIENCE-STUDENT-GROUP/

PrBecky Jacob

PrBecky Jacob is a MS Data Science graduate of 2018 and a Data Scientist at Sprout Social, a social media management SaaS company. An Austin native, Becky began her career at a small market research firm serving as the voice of science for website A/B testing and optimization. She left that job to pursue her graduate degree in data science at DePaul University. As a member of Sprout Social's Data Science and Growth teams, her primary role was to build out an efficient and fully robust testing platform for in app experiments as well as email and general website optimization. She also worked on subscriber and prediction models, as well as work with Neuro-linguistic programming. When she is not busy sciencing data, Becky can be found avoiding cooking at all costs, and running (slowly jogging) around parks throughout Chicago.

How did you decide on the MS Data Science and DePaul University?
I was really interested in data and pretty interested in coding. I did some googling, and kept coming across 'Data Science' as an emerging industry. It sounded like the exact combination of things that interested me! I knew I wanted a DS graduate program in a major northern city (I wanted to give winter a try), and a program that was in the CS school (as opposed to a business school) - since that was the area I needed to improve on most. DePaul checked all those boxes!

How did the MS Data Science prepare you for your career?
When hiring data scientists, companies are usually looking for a good combination between coding ability and comprehension of the math underlying ML algorithms. I feel like DePaul walked that line pretty well. When I graduated I wasn't an expert coder, but I was well equipped to complete interview challenges. Similarly, I'm not a mathematician, but the math courses in this program were very important for understanding what's happening under the hood of any model.

What is a typical day like on your job? What exactly do you do?
Throughout the program, people joked that 80% of data science is preprocessing and 20% is modeling. In the real world it may end up being more like 90/10. No company has perfect data, and depending on the makeup of your team you can spend a lot of time cleaning up data, hunting down data, and engineering features for your model. You may also spend a good bit of time on data engineering tasks, like working with databases, ETL, etc. This all depends greatly on the company you're at - but you should be prepared to not do modeling 8 hours a day.

What was your career path that led you to your current position?
I started out with a market research degree. But I knew I wanted to do more with data, so I found a role as a data analyst at a market research firm. When I realized how much I loved that job, I decided to go to graduate school to continue my career progression. I've been at my current company for 3 years. I started as a Data Scientist part way through graduate school and am now a Senior Data Scientist.

RESEARCH MISSION

To promote collaborative research among DePaul faculty in a variety of areas, including machine learning, text mining, NLP, health informatics, image analysis, recommender systems and database systems.

CONTACT US

✉ dsc@depaul.edu

🌐 http://cds.cdm.depaul.edu/

🐦 https://twitter.com/DePaulCDS

🏠 243 S Wabash Ave, Chicago, IL 60604