



Inside this Issue:

Cover Story2-4
Department News.....5-6
Outreach & Recruiting.....7
Spotlight.....8
Noteworthy Happenings.....8-9
Research News.....10-11
Automation Projects.....12
Graduation.....13

Dates to Remember for Spring Semester:

- Spring Classes Begin at 4pm on Monday, January 9
- Job Fairs: February 8 & March 2
- March 13-17 Spring Break Week
- Capstone Presentations, April 27th
- IME Advisory Board Meeting, April 28th
- May 16 Commencement

Cover Story: IME Welcomes New Faculty Members

COVER STORY: IME Welcomes New Faculty Members

We were very excited to welcome three new faculty members to the IME department this fall; Dr. Diana Lopez-Soto, Dr. Reza Maleki, and Dr. Harun Pirim. Each bring stheir own unique skills and experiences to share with both students and colleagues.

Dr. Diana Lopez-Soto

Dr. Lopez completed her Ph.D. in Engineering Sciences in 2016 at Monterrey Tech, Monterrey Campus, and in 2019 attended Purdue University as a visiting researcher at the Regenstrief Center for Health Engineering (RCHE). At that time, she worked on one of the most significant problems in many countries, including the U.S.: The crisis of opioid use disorder. Her academic career has been at Monterrey Tech in Mexico, where for the past five years, Dr. Lopez worked as a professor and researcher for the Industrial Engineering Department at the School of Engineering and Sciences.



Dr. Lopez has always been good with numbers. She enjoys math puzzles, problem solving, and the process of deducing solutions from a situation. This led her to a career in engineering.

When asked why she chose NDSU, Dr. Lopez stated she was impressed by NDSU's status as an R1 institution, which for her meant more opportunities for research and teaching. During her application process, Dr. Lopez encountered kind and candid people who are committed to the success of the department. For her, this was also an important reason for choosing NDSU.

Dr. Lopez's research focuses on building data-driven solutions to support the decision-making process. Some topics of interest to her are healthcare systems engineering and analysis, public policy analysis, process analysis and improvement, operations management, and supply chain efficiency. Dr. Lopez is currently working on two research projects; the first is related to healthcare and focuses on the cause-effect analysis of resistance to antibiotics and the second is related to the analysis of the supply chain of food crops and the deterioration in post-harvest storage facilities. Dr. Lopez is passionate about research because, for her, it is more than just a way to contribute to the scientific literature. Research has been her own path for evolving as a person. Working with healthcare projects, for example, has been a way that has redefined some of her previously held beliefs, assumptions, and stereotypes. Sharing these projects with students has allowed Dr. Lopez to show how, through research, there is always something a person can do to generate the change they want to see in our society.

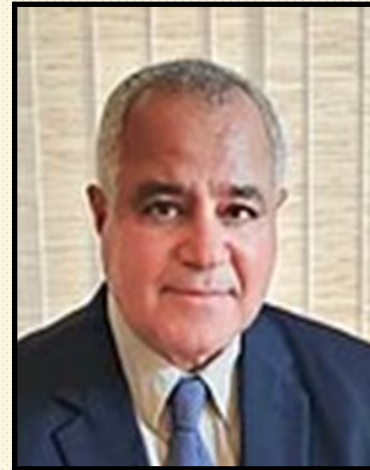
Dr. Lopez is excited about the challenges and the learning opportunities that await her here at NDSU. Now that she has completed teaching her first course here at NDSU (IME 480—Production and Inventory Control) her plans are to start putting building her research team, meet and work with professors, and also connect and collaborate with companies to create projects.

Welcome Dr. Lopez!

COVER STORY: Meet Our New Faculty Members

Dr. Reza Maleki

Dr. Maleki is an alumnus of NDSU. He received his B.S. in IME in 1981, M.S. in IME in 1982, and Ph.D. in Engineering in 1989. Dr. Maleki has 37+ years of professional experience; which includes serving in four universities and working as a consultant with diverse manufacturing companies. He is a registered professional engineer, certified manufacturing manager, academic associate of Avraham Y. Goldratt Institute, and Lean Bronze Certified Practitioner. He has also completed the requirements for and received certification in Lean Leadership. Included in Dr. Maleki's publications is the book, "Flexible Manufacturing Systems-the Technology and Management"; published by Prentice-Hall. Prior to North Dakota State University, he attended Casper College in Casper, Wyoming, where in 2021 he was recognized as one of the 25 exemplary alumni during the College's 75th anniversary.



When asked why he chose the field of engineering, Dr. Maleki explained that in his years attending secondary schools there was heavy emphasis on technical training and awareness of engineering education. The technical school he attended was on the same campus as a major engineering school. In addition, there was always an appreciation of and an impact of engineering education. Collectively, all of these had an impact on Dr. Maleki's decision to become an engineer.

Coming to NDSU was like a homecoming for Dr. Maleki. He expressed that while a student here, the impact the faculty had on him and the help he received were outstanding. Ultimately, he enrolled in graduate study and received his MS and Ph.D. After many years of teaching and practicing industrial engineering, Dr. Maleki joined IME at NDSU. After teaching here for 11 years, he left to work as a senior business advisor working with manufacturers in North Dakota and west central Minnesota. This year there was an opportunity to come back to IME and Dr. Maleki is back doing what he loves, working with students. Dr. Maleki serves as a professor of practice with a heavy focus on teaching. That being said, he has always been interested in helping students in conducting applied work on behalf of business and industry clients.

As a former student of NDSU's IME program, Dr. Maleki benefitted from the very positive interactions he has had with faculty and their roles in helping him achieve his educational and professional goals. This has truly been the foundation for Dr. Maleki's passion of working with and serving the students helping them to achieve their fullest potential.

Dr. Maleki feels IME is a great and supportive department to serve in and fulfill his teaching responsibilities. He is most looking forward to as many opportunities as possible to help the department with many of its strategic goals which include, but not limited to, increasing enrollment.

Welcome back Dr. Maleki!

COVER STORY: IME Welcomes New Faculty Members

Dr. Harun Pirim

Dr. Pirim received his Ph.D. in Industrial and Systems Engineering from Mississippi State University. His research interests include mathematical programming and network clustering applications in biological and social sciences. In relation to graph theory and discrete optimization, his recent work focuses on social media network analysis to distinguish people with certain traits, network clustering to predict functions of hypothetical proteins, and functional brain network analysis to predict the existence of the disease. He has published several papers in reputed journals and conference proceedings and written book chapters. He edited two books on data clustering and graph theory and has served as a reviewer for many journals.



Dr. Pirim chose the field of engineering because of his love of mathematics and logic. In his home country, Turkey, students whom are interested or gifted in the area of math are encouraged to enroll in engineering programs. Later, Dr. Pirim's interests shifted to engineering in relation to social sciences.

When asked why he chose NDSU, Dr. Pirim stated the faculty on the IME website gave him an impression of a small yet well-versed faculty with whom he could easily collaborate. He was also impressed with Fargo's good reputation, friendliness, well-established k-12 education, and short commute times.

Dr. Pirim is very involved in his research. He is eager to understand system-component or whole-part relationships with respect to connectivity of the system and closeness/affinity between system components. The fields he is interested in this regard are discrete optimization, graph machine learning applications in computational biology, social science, and neuroscience. Recently, Dr. Pirim has been working on three distinct problems: network clustering of hypothetical proteins in bacteria genome, functional connectivity analysis of brain networks, and social media analytics.

In simple terms, Dr. Pirim is interested in the beauty and perfection of life. Ideas, tasks, teams and systems have contributed to this inspiration. He is passionate about ascribing meaning to both minute and large-scale affairs in his life. He is inclined to understand the power of adaptive perception and good intention.

Dr. Pirim is enjoying his first semester at NDSU and is looking forward to continuing to engage with his students through inspiring and joyful classroom activities. Also, he is excited to integrate his research experience with teaching.

Welcome Dr. Pirim!

Department News

Fall Semester

To start the new academic year off right, the IME department held a picnic to welcome students back to campus. It was wonderful to see faculty, students, and staff together again ready to begin a new semester.



Staff Additions to the Department

Dan Whitney was hired to replace Armon Myrick in the machine shop. Armon retired in December. Dan comes to us with 30+ years of experience in industry. He graduated from St. Cloud Technical College in 1990 with a Machining/CNC Programming degree. He has worked as a CNC machinist, CNC programmer, and Production Manager. Dan has served many industries including precision granite, aluminum and magnesium die casting, OEM automated food packaging and OEM automated pharmaceutical packaging equipment. Dan will be teaching IME 330 Manufacturing Processes and IME 430 Process Engineering. In the future, he will begin teaching IME 335 Welding Technology.



Jared Hineman is our new Assistant Director of the Great Plains I-Corp Hub. Jared is an NDSU alumni and comes to us with many years of entrepreneurial experience. He finds great fulfillment in helping others to turn their ideas into enterprise business. Jared will be responsible for overseeing the Great Plains region and helping spread awareness for the hub. Over the next couple months, he will be building out his team and get the hub ready to host their first Cohort this March.



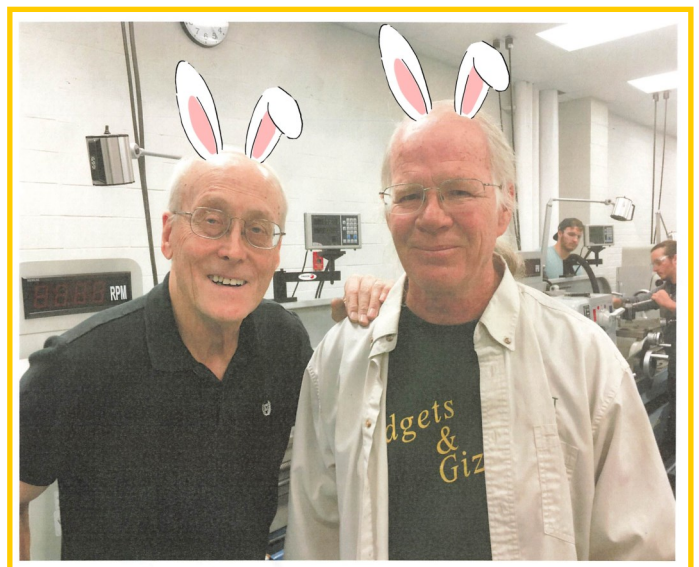
Armon Myrick Retires After 20 Years of Service to NDSU

Armon Myrick retired on December 31 after twenty years of service to NDSU. Armon began his career at NDSU in 2003 working part-time in the machine shop. Later he began working with the mechanical engineering motorsports team in the evenings for a year. He worked in the psychology department for a short time before joining the IME department. Armon worked for 2 years as a seasonal employee in IME before being hired full time in 2007 as a lab technician and instructor. During his time at NDSU, Armon was also successful in leading a team of engineering and computer science students to compete and excel at the NASA Robotic Mining Competition.

It has been said of Armon that he doesn't teach the easy way, he encourages active thought and troubleshooting to help the students not only excel in the classroom, but to help them excel in life. Armon has not been only an instructor here at NDSU, he has been a mentor to many students throughout the years.



When asked what he has appreciated most in working at NDSU, Armon stated the students have kept him young in thought and the staff has helped keep him engaged. Armon expressed he will greatly miss the interaction and endless banter with staff members. It goes without saying that Armon will very much be missed by everyone in the IME department. We wish Armon all the best in his retirement. He has worked hard and it is well deserved.



Outreach and Recruiting

Manufacturing Day

Beth Dahl traveled to Jamestown and Dickinson ND this past October to represent the IME department at Manufacturing Day in Dickinson and Career Day in Jamestown.

According to the Dickinson Press, more than 575 students attended Manufacturing Day. This event is a good opportunity for students to engage with universities and industry leaders to learn more about the manufacturing field.



STEM Event

Dr. Diana Lopez and Beth Dahl participated in the 5th Annual Brain-STEM event at Concordia College. More than 300 Ben Franklin 7th graders attended the event and had the opportunity to select from 21 workshops. The Event promotes diversity in stem where students can meet with role models from different backgrounds while learning about new careers.

Dr. Lopez and Beth presented an activity on paper airplane construction to emphasize the importance of all aspects of engineering—quality control, material, cost, project management and working together to develop a design that would fly further than competing teams.



Visit to Bogota, Columbia

In late November, Dr. David Grewell and Dr. Kambiz Farahmand travelled to Bogota, Columbia to meet with faculty and staff at three universities in the area. They were able to visit Universidad de los Andes, Pontificia Universidad Javeriana, and Universidad Sergio Arboleda. The potential for transfer students is of great significance with over 1,700 IME students in attendance at los Andes.

The purpose of the visit was to build relationships and collaborate with these universities on a 2+2 program for IME and ME programs. A 2+2 program would allow their students to complete their first two years at their home university, and then transfer to NDSU to complete the next two; thus earning a degree in both countries. Students from Los Andes are required to learn a 2nd language, which is usually English, so the language barrier will not be as difficult as 2+2 programs in the past. Currently, their university is re-mapping their curriculum and we will be translating syllabus information.



Spotlights....

#NDSU Intern Spotlight: Matt Scott

Matt Scott, an industrial engineering student, was featured in the #NDSU Intern Spotlight. Matt interned with Doosan Bobcat in Bismarck, ND. Matt stated he chose to work with this company because Bobcat always has many interns, so he knew he wouldn't be alone and he's only heard good things about the company.

When asked what his favorite part of the internship was, Matt stated, "My favorite part of my internship so far has been learning about the job-force, and learning things I could never learn in the classroom through hands-on experiences". Matt expressed the most challenging part of interning at Doosan Bobcat was learning the terminology and utilizing best practices to get results.

Matt was also asked what advice he would give a student who is in the process of applying for an internship, he mentioned soft skills. Matt feels communication skills and being personable can often times be more important than what experience you have.



Noteworthy Happenings...

Research Experience for Undergrads (REU)

The Department of Industrial and Manufacturing Engineering provides undergraduate students a chance to participate in fundamental and applied research opportunities in the fields of sustainability, logistics, operational research and human factors. The students can gain hands-on experience with supply chain management, OR, optimization, additive management, automation, manufacturing, quality and reliability, and simulation.

Last summer we welcomed Daniela Ruiz Lopez to campus as part of the *REU* program. Daniela is a biomedical and industrial engineering student at Universidad de los Andes in Bogotá, Colombia. . While here, Daniela conducted research focused on studying the prediction of Attention Deficit Hyperactivity Disorder (ADHD) in children 6-8 years old according to their symptoms, socio-economic factors and academics through Machine Learning techniques. She collaborated with Dr. Pirim Harun and Dr. David Grewell on this research project.



NDSU Giving Day 2022

NDSU alumni, friends, students, staff and faculty raised nearly \$1.4 million and secured nearly 1,600 unique gifts on the seventh annual NDSU Giving Day, held Nov. 29. Leading up to Giving Day, benefactors committed more than \$950,000 in matches and challenges to amplify the impact of gifts. Thank you all for your generosity!



Noteworthy Happenings...

Spencer Duin Classroom Visit

On November 18th, Dr. Spencer Duin visited IME 480. Dr. Duin graduated from NDSU with a B.S. in Industrial Engineering in 1965. He went on to have a highly successful career at Westinghouse and Eaton Corporation. During his career, Dr. Duin oversaw the implementation of cutting edge industrial engineering techniques and managed thousands of employees. He shared with students some of his experiences and how he succeeded in running large companies. Spencer received the IME Recognition of Excellence Award in 2019 for his outstanding achievements!



Society of Women Engineers

Society of Women Engineers (SWE) held their annual conference in Houston, TX on October 20—22. This is the world's largest conference for women in engineering and technology. A conference goer stated there are very inspirational speakers who have all made a difference for women in engineering, as well as a ton of opportunities to learn more about how to navigate in this male dominated field.

The NDSU SWE chapter is very active with community outreach events, supportive networks and professional development. If you are interested in joining or want to learn more, please reach out to President, Samantha.stickler@ndsu.edu



IME SWE members: Miranda Salmon, Megan LaLonde, Brooklyn Kelsch



I-Corps Great Plains Region

NDSU has been awarded a 14 million dollar grant from the National Science Foundation (NSF) to be used over the next five years to establish an I-Corps Hub. This Great Plains Innovation Corps (I-Corps) will provide entrepreneurial training for scientists and engineers with the goal of moving ideas to commercialization.



The IME department chair, Dr. David Grewell, will serve as the director of the I-Corps Hub, oversee the Hub activities and coordinate the efforts of all eight of the Hub's partners. Dr. Grewell stated, "As a regional Hub, it's critical that multiple institutions are successfully integrated to ensure coverage across the entire region and to represent the specific needs of their respective areas. NDSU's experience at leading the CB² center provides a unique perspective on how to successfully bring together the multiple institutions in the HUB. The I-Corps program has a proven record of being an economic catalyst. The team of institutions that represent the Great Plains region was highly cooperative and enthusiastic during the proposal concept development and I have absolute confidence that the Hub will quickly grow on many levels and the region will benefit from its economic impacts."



Dr. David Grewell

The Hub is made up of the following universities:

- North Dakota State University
- The University of North Dakota
- South Dakota State University
- South Dakota School of Mines and Technology
- Dakota State University
- University of South Dakota
- University of Wyoming
- University of Nebraska Omaha



State Senator, Ron Sorvaag, spoke at the news release on October 14, 2022

GOALS OF GREAT PLAINS REGION I-CORPS

Training: Deliver regional I-Corps training at partner institutions and staff national instructional teams.

Expansion: Identify, recruit and support teams for regional I-Corps training and recommend teams for the national Corps program. Grow the Hub by identifying new member institutions.

Evaluation, assessment, and research: Collect and analyze data from participants in the regional program to evaluate and improve the Hub's performance and conduct entrepreneurial research.

CB² Annual Fall Meeting

The Center for Bioplastics and Biocomposites (CB²) held its fall meeting November 15-16 at the Kimberly Clark Corporation Headquarters in Roswell, GA. A welcome reception was held first on November 14th to gear up for the two day meeting. There were a total of 76 attendees, 56 in person and 20 virtually.



The first day of the conference involved listening to PI's (Principal Investigator) present their proposals to the IAB (Industry Advisory Board) members. During the second day, the IAB members had another chance to hear PI's speak briefly about their proposals. The proposals were then voted on to choose which of those would be awarded money for their 2023 projects. In total, there were 18 proposed presentations. Of those 18, 12 were awarded a total of \$814,818.

The Little –Known Nylon: Nylon 59 Properties, ISU/UGA, Erick Conchran/Jason Locklin

Natural Fiber Reinforced Nylon-Based Composites for Under the Hood Applications, WSU, Vikram Yadama

Bio-Based Core-Shell Impact Modifiers to Increase Toughness of Composites and Adhesives, ISU/Eric Cochran

Exploration of Bio-Based Functional Building Blocks for Durable Coatings, NDSU, Dean Webster

Investigation of the Marine Degradability of Polymers of Interest to IAB members, UGA, Branson Ritchie

Bio-Based Coatings for High-Performance Flexible Paper Packaging Application, UGA, Suraj Sharma

Water Barrier Mechanisms in Bio-Based Polymers, NDSU/UGA, Andriy Voronov/Sergiy Minko

Improved Understanding for Water Permeability in Bio-Based Materials, NDSU, Bakhtiyor Rasulev

Development of Bio-Based VOC-free Powder Coating Resin Systems, WSU/ISU, Jinwen Zhang/Eric Cochran

Utilizing Hemp Hurd, Improving Hemp Hurd Performance as Filler in Plastic Manufacturing, NDSU/UGA, Ali Amiri/Breeanna Urbanowicz

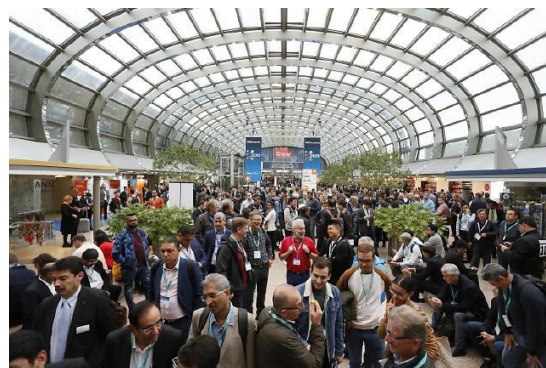
Development of Hempseed Oil-Based Lignin-Containing Isocyanate-Free Polyhydroxyurethanes as Recyclable Plastics and Foams, WSU, Baoming Zhao

Chemical Recycled PLA Based Monomer as High-Performance Additive for Nylon Based Blends and/or Composites, WSU, Yu-Chung Chang

Three new companies joined CB² and will become members in the 2023 term; Cargill, Indiana Soybean Alliance Inc. and PlantSwitch. This brings the total membership to 30.

K-Show 2022 Germany

K 2022 was held October 19th—26th in Dusseldorf, Germany. This event is the “World’s No. 1 Trade Fair for Plastics and Rubber”. This year’s show welcomed approximately 3,330 exhibitors and 224,000 visitors. Our IME Chair, Dr. David Grewell, was able to attend the event.

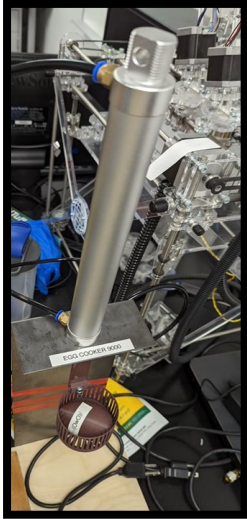
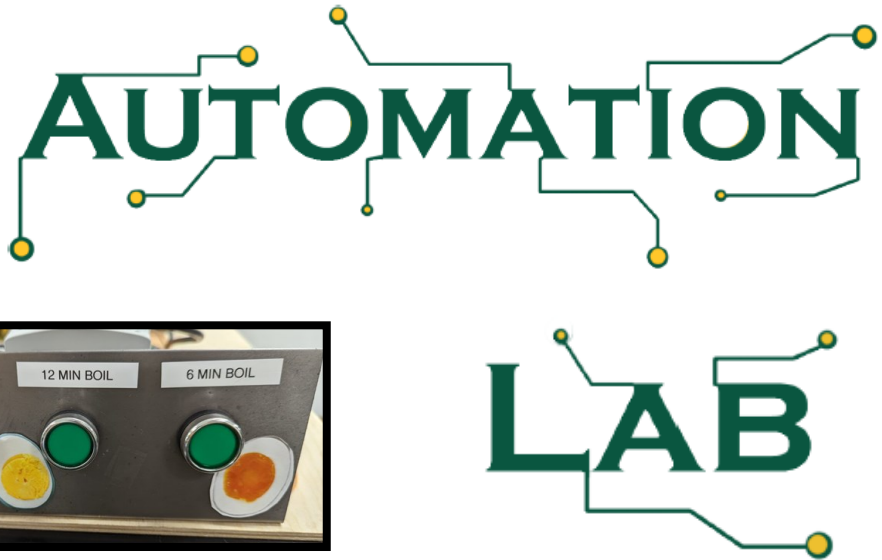


The Hot Topics of K 2022:

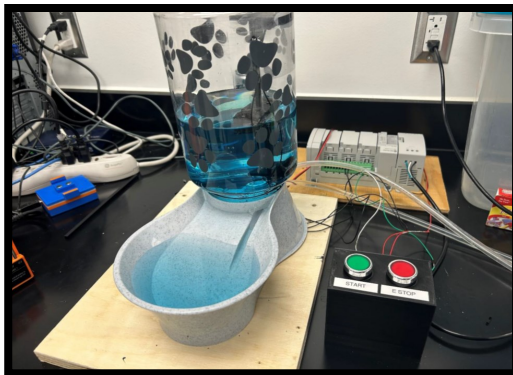
At the last edition of K three years ago, exhibitors already unanimously emphasized the need for operational and closed cycles along the complete material chain. Never before had the industry been so unanimous in addressing an issue and working so cohesively on solutions for environmental compatibility, resource conservation and waste reduction. This development has accelerated since then. K 2022 provided impressive proof that this industry assumes responsibility and that plastics in the future will be part of the solution rather than a problem. And this is precisely why the three hot topics of K 2022 were Circular Economy, Climate Protection and Digitalization.

Automation Projects

In IME 482 (Automated Manufacturing Systems), students learn how to use automation software such as Fusion 360, tools, and equipment such as plc's (programmable logic control). The course is taught by Dr. Lokesh Narayanan and involves a final group project which requires designing a simple automation system. The following designs are from the fall semester.



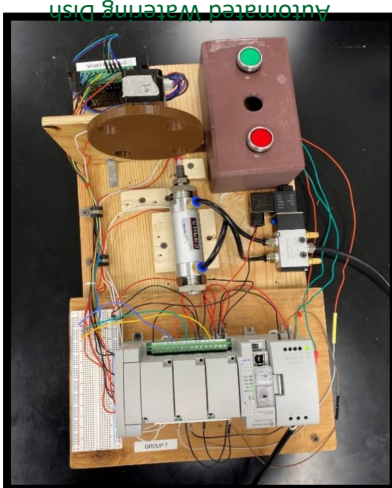
Automated Egg Boiler



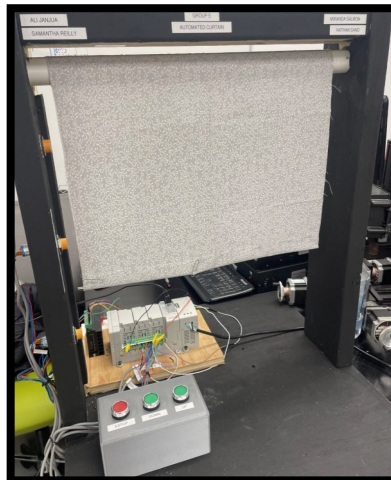
Automated Watering Dish



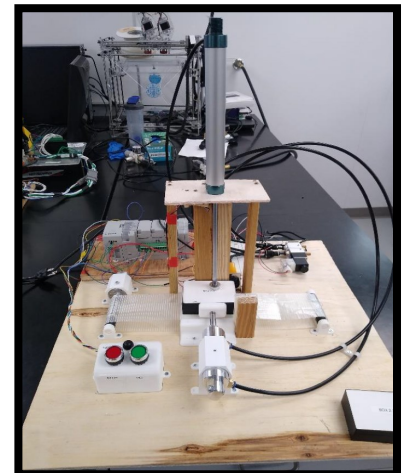
Automated Can Crusher



Automated Part Cleaning Brush



Automated Curtain



Automated Drill

Congratulations to all of our fall graduates!



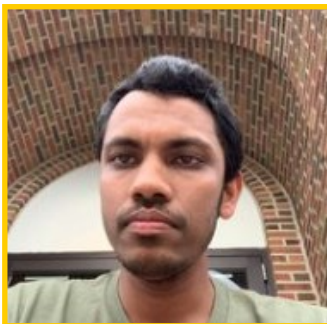
This fall's graduation ceremony was unfortunately impacted by severe weather conditions. The University moved ahead with the ceremony despite blizzard conditions and a no-travel order. Due to the weather and dangerous road conditions the ring ceremony was cancelled and many graduates and family members were not able to make the ceremony. Graduates were given the option to walk during the spring semester commencement.

Fall Undergrads:
IE&M – 6 graduates
Mfg – 9 graduates



Graduate Students:

PhD Recipients:



Arup Dey

Dissertation Title: Advanced numerical modeling in Manufacturing Processes

Arup is now an Assistant Professor at Navajo Technical University in Crownpoint, NM

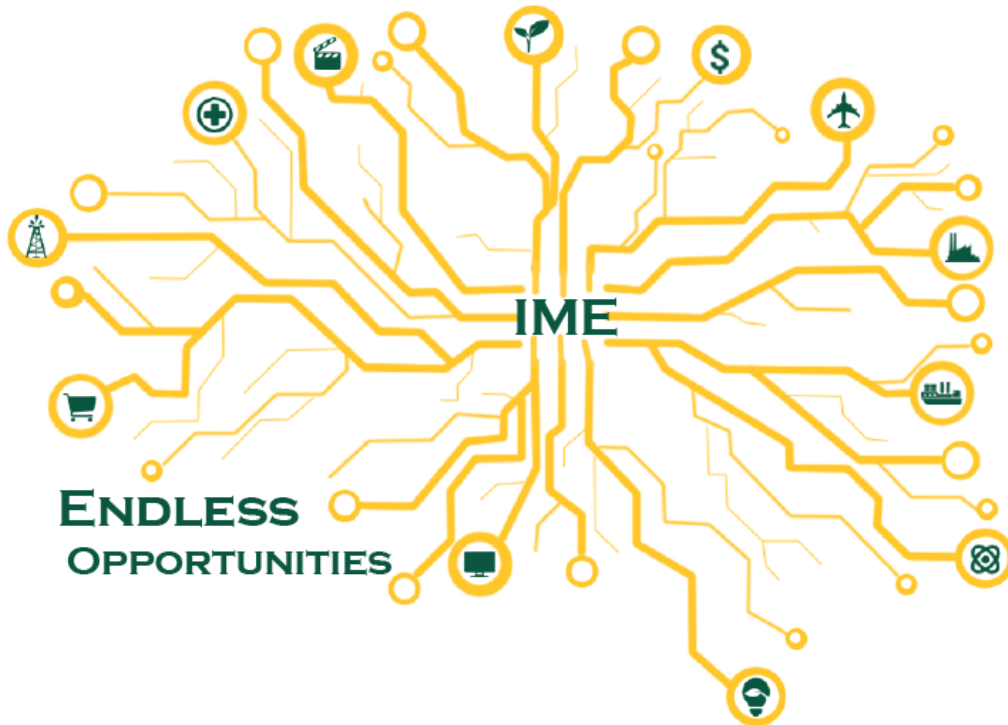


Ameneh Forouzandeh Shahraki

Dissertation Title: Predictive reliability analysis and maintenance planning of complex systems working under dynamic operating conditions

Ameneh is now working with eBay as a data scientist

We are so proud of you



Looking for more information about the IME department
or past newsletters?

Check us out on our website at: [NDSU.edu/ime](https://www.ndsu.edu/ime)
Or follow us on Instagram!



Industrial & Manufacturing Engineering
NDSU Department 2485
1315 Centennial Blvd
Fargo, ND 58102

Phone: 701-231-9818
E-mail: bethany.a.dahl@ndsu.edu