

ENSI INFORMER

College of Science and Engineering, Department of Engineering Sciences
M O R E H E A D S T A T E U N I V E R S I T Y

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Engineering Sciences Says Farewell to Dr. Eric Jerde and Wishes Him the Best in His Future Retirement Endeavors

It has been very busy for the Engineering Sciences department since the last meeting. The new Engineering Department building is progressing. Presently the faculty and staff are working with the architects to lay out equipment in the labs. This is a slow, but necessary, step that is coming along in a timely manner. Kim Oatman has reported that the planned groundbreaking is still on schedule for late fall of this year sometime in October or November.

In addition to the Engineering Sciences building President Morgan announced that there is a good chance that Morehead State University will receive \$90 million more dollars to build another building on campus to replace Baird Hall, the music building, and the Combs building, the School of Business. This new project will hopefully allow students from the Engineering Sciences department to get some real-world experience with this project as they did with the Engineering Sciences building with respect to any surveying that may need to be done.

Dr. Eric Jerde has done a great job being the Chair of the Engineering Sciences department. Presently he has overseen two search committees. One of the committees was for a new Geophysical Science Instructor and the other is for a new Department Chair. Presently, there is no official word on who was selected and who has agreed to come to Morehead State University. Other aspects of his tenure as the department chair have been the integration of five separate units into one department. Those five units are Engineering, Computer Science, Physics, Earth Science, and Space Science. In addition to the units themselves, curriculum from each unit is being compared to reduce unnecessary duplication of classes. This will be a slow, but necessary process, and with the assistance of the faculty this will ultimately benefit the students. Eric worked to help merge the two-unit budgets, he created committees to address creating a unified FEP. He is working with both units to finalize new curriculum maps that will include tracks to help serve the students as a whole and to help market the department to prospective students. He tasked a committee early on to create the department name. All of this while teaching classes and performing his daily duties as department chair. He has also brought four individuals from the space science center over to the department as full-time faculty in the department whereas before they were teaching for us part-time. He has tried to be familiar with all the new department faculty members and curriculums. With his new vision for Engineering Sciences this will allow the department to flourish in the future thus ensuring that the department will continue to grow.

James Bradley
Facilities and Lab Manager
Engineering Sciences Department
College of Science and Engineering
Editor, ENSI Informer Magazine

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ENSI STUDENT spotlight

Olli Uusikartano and Gunnar Gross are students that are doing research in the area of communications with CNC controls. Their project is being overseen by Dr. Jorge Ortega-Moody and addresses the critical issue of inefficiencies and delays caused by CNC machine errors and stoppages. These interruptions often go unnoticed for extended periods of time, leading to increased downtime and decreased productivity. The primary goal is to develop a system capable of remotely detecting machine errors and stoppages, thereby minimizing downtime and increasing productivity. Additionally, we are implementing a predictive maintenance approach to identify which machines require more/less maintenance. By using advanced data analysis techniques and machine learning algorithms, we will be able to provide insights into maintenance repairs, increasing the overall efficiency and reliability of CNC operations.



Gunnar Gross



Olli Uusikartano

MILL DATA



X Position	8.97
Y Position	4.11
Z Position	4.09
Spindle RPM	0

LATHE DATA



X Position	13.85
Y Position	4.24
Spindle RPM	100.09

ENSI FACULTY spotlight

Wilson González-Espada published two peer-reviewed articles last fall semester.

The first one, co-authored by Dr. Blankenship (MATH), Belinda Candra, and Logan Pennington (URFstudents) is titled “Children’s Understanding of Analog Time Keeping: Longitudinal View and Potential Misconceptions” and can be found in the Journal of the Kentucky Academy of Science, volume 84. The article quantifies the ability of a sample of 1,932 students in grades 3-12 to tell time using numbered and numberless analog clocks.



Wilson González-Espada

The second article summarizes the history and ongoing efforts of a group of astronomers from the University of Arizona (Sóley Hyman), Harvard University (Allyson Bieryla), and Universidad del SagradoCorazón (Wanda Díaz-Merced) interested in helping blind students experience the 2024 total solar eclipse using sonification. The publication, titled “Sounds in Sunlight” can be found in The Science-Teacher, volume 90, a publication of the National Science Teachers Association aimed at high school students.

In addition, Kaitlyn Nelson (Early Scholars Program) and Alexandria Black (Craft Academy), two of Dr. González-Espada’s research fellows, presented at the Kentucky Academy of Science and were selected to represent the state in the 2024 American Junior Academy of Science meeting in Colorado. Kaitlyn studied weather misconceptions among college students, and Alexandria explored randomness issues in radioactive decay simulations for high school students.

ENSI FACULTY/STUDENT spotlight

Dr. Heba Elgazzar and Dalton Hensley (CS Senior) have a research poster on “Spiral: A New Novel Programming Language for Software Development” that was presented recently at the 2024 Posters-at-the-Capitol held on March 5th, 2024.



Heba Elgazaar

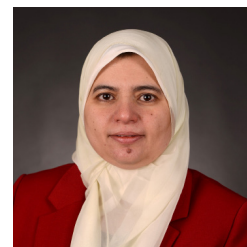


Dalton Hensley

Dr. Elgazzar and Dr. Rashad received a funding contract for NCAF-C 003-2023 Cybersecurity Workforce Innovation, National Centers of Academic Excellence in Cybersecurity via University of Louisville Research Foundation, Inc.



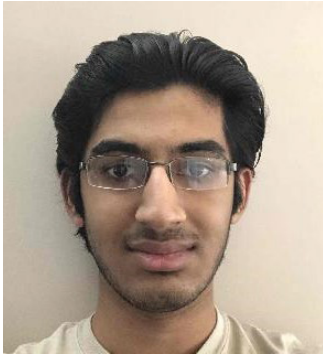
Sherif Rashad



Heba Elgazaar

ENSI ALUMNI **spotlight**

Recent Computer Science graduates were hired after completing internships and coops during their study in the CS program. Thanks for our industrial partners for supporting our students and providing these valuable internships and coops opportunities that paved the way for starting a successful professional career path for new graduates:



Mann Patel

**Mr. Mann Patel
SRC Inc.**

Mann was graduated recently from the Computer Science program in Fall 2023 and accepted an offer from SRC Inc. He started to work with SRC Inc. as a Software Engineer in January 2024 after graduation. Mann completed a successful internship as a software engineering intern with SRC Inc. in Summer 2023, which exposed him to many new technologies and gave him valuable working experience in the areas of software engineering and machine learning. Congratulations, Mann!

**Ms. Danielle Kossler
Cumming Creative Group
(CCG)**

Danielle was graduated recently from the Computer Science program in Fall 2023 and accepted an offer from CCG. She started to work with CCG as a Junior Software Developer in January 2024. Danielle started at CCG as a summer software developer intern in 2023 and went from being a summer intern, to a part-time worker over her last semester of college, and then to a full-time junior software developer after graduation. Congratulations, Danielle!



Danielle Kossler

**Mr. John Reichenbach
DXC Technology**



John Reichenbach

John was graduated recently from the Computer Science program in Fall 2023 and accepted an offer to start to work full-time with DXC Technology. John completed two successful internships with DXC Technology in Summer 2022 and Summer 2023 during his study. John was responsible for creating various monitoring and data analysis tools which were used by the performance engineering team to analyze and monitor data. The internship opportunities helped him apply the programming techniques and practices that were learned in class to a real-world problem and develop solutions that are still being used. Congratulations, John!

Caiwen Ding Receives NSF Career Award



Caiwen Ding

Congratulations to Caiwen Ding for receiving the prestigious NSF CAREER award for his project, "Algorithm-Hardware Co-design of Efficient Large Graph Machine Learning for ElectronicDesign Automation".

Estimating Power, Performance, and Area (PPA) earlier in the electronic design automation (EDA) flow would improve the Quality of Results (QoR) and reliability in chip design. The classical analytical or heuristic methods can be challenging to fine-tune, especially for complex problems. Machine learning (ML) methods have proven to be effective in addressing these

problems. Graph Neural Networks (GNNs) have gained popularity since they are among the most natural ways to represent the fundamental objects in the EDA flow. However, with increased design complexity and chip capacity, an increasing performance gap exists between the extremely large graphs in EDA and the insufficient support from general-purpose hardware, such as mainstream graphics processing units (GPUs). This project aims to expedite the large graph machine learning on various EDA tasks, through a full-fledged development of efficient and scalable computing paradigms. This project's novelties are EDA domain knowledge-aware graph machine learning, training acceleration, and algorithm-hardware co-design and optimization. The project's broader significance and importance include: (1) to advance the field of machine learning in chip design, highlighted in National Artificial Intelligence Initiative; (2) to deepen the understanding of interactions among EDA domain knowledge, graph learning, and GPU acceleration; (3) to enrich the computer engineering curriculum and promote participation from undergraduates, underrepresented groups, and K-12 students in STEM fields through relevant programs.

The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the National Science Foundation's most prestigious awards in support of early-career faculty who have the potential to serve as academic role models in research and education and to lead advances in the mission of their department or organization.

ENSI NEWS **spotlight**

Rowan County High School Engineering and Theater Group

On March 29, 2024, the Rowan County High School engineering and theater students came to Morehead State University to get a tour of the Theater Department and the Engineering Sciences department. After arriving on campus the first stop for the students was the Theater Department. After that stop Leeann Akers, STEM Assistant Director, brought them to Reed Hall 105 for a presentation from the Engineering Sciences department. Tyler Ward gave a presentation about the opportunities within the Computer Science area. Next, Dr. Tathagata Ray gave a presentation about the Engineering area within the department. After his presentation, Dr. Ray showed the students his wind tunnel and earthquake research project. The students seemed to be interested in the wind tunnel as Dr. Ray was demonstrating it. Afterwards, the students were shown the robotics lab, the 21st Century Manufacturing and Automation Lab, and the construction lab. The students were also given a presentation about each of these labs and all questions that were asked was answered. As the students were leaving they seemed to enjoy the presentations.



Dr. Tathagata Ray is explaining his wind mitigation research using a wind tunnel for his research and how it can become a very useful tool for future building constructions in an effort for the building industry to go more green. He turned the wind tunnel on and demonstrated how it is being used in his research and the students seemed to be interested in what he was doing.

ENSI ADVISORY BOARD **spotlight**

Justin Lane New Advisory Board Chair-Elect



Justin Lane

At the April 12, 2024, Advisory Board meeting hosted by the Engineering Sciences department Justin Lane, the Operations Project Manager for Thoroughbred Engineering, volunteered to become the next Advisory Board Chair-Elect. I am sure that with Chase Johnson's help that Justin Lane will be more than prepared to take over as the new Advisory Board Chairman. Congratulations to Justin in his new role.

REGIONAL EKTSA AT MOREHEAD STATE UNIVERSITY

Morehead State University's Department of Engineering Sciences (ENSI) hosted the 27th annual Technology Student Association (TSA) Regional Competition on February 9, 2024. Attendees included 317 students and teachers from 11 High Schools (Mason County HS, Rowan County Senior HS, Menifee County HS, Powell County HS, Carter County CTC, Fleming County HS, Ashland Blazer HS, Bryan Station HS, Raceland HS, Russell ATC, and Morgan County HS) and 4 Middle Schools (Ashland MS, Raceland Worthington MS, Rowan County MS, and East Carter MS). The students participated in different events based on the concepts covered in the students' courses in Engineering Technology Education. The purpose of this regional event is to prepare and evaluate the participating student's projects before going to the state competition. The Regional competition allows the students to improve their projects for state competition based on the feedback they receive from ENSI faculty, staff, and MSU student volunteers.

The event began with the EKTSA regional student officers conducting the TSA opening ceremony before dispersing throughout the Adron Doran University Center to compete in different events.

In the High School competition, Carter County CTC had an impressive performance with 18 different awards including ten first place, five second place, and three third place. Bryan Station came in a close second with sixteen different awards including six first place, eight second place, and two third place awards. Morgan County students won twelve awards including six first place, three second place and three third place, while Russell County ATC pulled in ten awards including seven first place, one second place and two third place. Students from Rowan County won six awards with two first place, two second place, and two third place awards. Mason County took four awards with one first place, two second place and one third place awards. Powell County finished with two second place awards, while Fleming County had one first place and one second place finish. Ashland Paul Blazer and Raceland-Worthington each finished with one second and one third place award. Menifee County had one third place award.

In the Middle School Competition, Rowan County had 12 awards with six first place, four second place and two third place. Raceland-Worthington garnered six awards including four first place, and two second place. Morgan County had two first place awards, while Carter County had one first place and one second place finish. Ashland finished with one second place and one third place award.

The EKTSA Regional Student Officers closed the regional competition by holding an awards ceremony and extending special thanks to the Department of Engineering Sciences faculty including Dr. Nilesh Joshi, Dr. Sherif Rashad, Dr. Anindita Paul, Dr. Steve Stubbs, Dr. Qingzhou Xu, Dr. Cheng Cheng, Dr. Wilson Gonzalez-Espada, Police Chief Merrell Harrison, Officer Mike Trent, Mr. Asim Chaudhry, organizers Mr. James Bradley and Mr. Jason Stepp, and student volunteers for hosting and judging the events.

ENSI/COLLEGE spotlight

To create a positive rewarding environment not only for students, but for the faculty as well, there have been several faculty members that have been promoted to tenure status. They are as follows:



Dr. Katelyn Kaufman
Agriculture
Associate Professor



Dr. Joshua Qualis
Mathematics
Associate Professor



Dr. Lisa Wallace
Nursing
Associate Professor



Dr. Shannon Smith-Stephens
Nursing
Associate Professor



Dr. Melissa Mefford
Biology/Chemistry
Associate Professor



Dr. Kevin Adkins
Engineering Sciences
Associate Professor

Please join me in congratulating them and recognizing their accomplishments as they continue to excel in their careers at Morehead State University. This is a another step in their professional growth that will benefit not only themselves, but the students and other faculty and staff members around them. By fostering a continuously growing environment among the faculty and staff this will set a great example for students to follow in their futures and will thus help to ensure that Morehead State University can and will make a positive impact on the world around them now and in the future.



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The 2024 ATMAE Annual Conference will be held on October 28-October 31, 2024, at the Plaza Hotel in Las Vegas, Nevada.

The Engineering Sciences Department hosted the annual EKTSA Eastern Regional Competition on Friday, February 9, 2024. Faculty, staff, and students also attended the State TSA competition held on March 18 and 19, 2024, and served as Judges.

For 2024, MSU once again made the rankings of U.S. News & World Report as one of the Top 20 public regional universities in the South. MSU is ranked #19 in public regional universities in the South. This is the 8th consecutive year MSU has made the Top 25 (highest rank was #15 in 2023) and marks Morehead State's 20th consecutive year as a top-ranked institution.

In the University Regional South Category, U.S. News & World Report also recognized MSU as one of the Best Undergraduate Teaching (#13), Best Colleges for Veterans (#16), Best Value Schools (#28), and Top Performers on Social Mobility (#83). Our academic programs and services are ranked at the state and national levels.

For more information go to <http://www.moreheadstate.edu>