SCHOOL OF ENGINEERING AND COMPUTER SCIENCE

Bits & BYTES

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CS Students Participate in Data Mine Projects at AstraZeneca and Evonik

SECS is proud to announce that our Computer Science students have been accepted to work on multiple Data Mine projects this academic year.

Earlier this month, Dr. Maxwell Omwenga and two Computer Science students, as part of the Data Mine program, has the pleasure of visiting the AstraZeneca plant in Mt. Vernon, IN *(COVID-19 vaccine company, how cool is that!!!)*. They had a tour of the facility, and it was a great opportunity for them to establish connections with the team there. The students, Ghaya Mtimet (Junior) and Abdelrahman Elaraby (Sophomore) are working with AstraZeneca through Data Mine to develop an app to support the plant's operations. The experience has been incredibly beneficial so far.

Andrew Thompson (Sophomore) was recently accepted to work on a Data Mine project at Evonik, where he will work with Evonik Engineers to create a dynamic program that will generate Materials of Construction Matrices to determine compatibility using corrosion rates, temperatures, and concentrations.

The Data Mine, which originated at Purdue University, is currently in its seventh year. It has now been expanded to several partner institutions across the USA, inviting students from Indiana universities beyond Purdue West Lafayette to participate, including students from the University of Evansville. The Data Mine provides a meaningful, rigorous, impactful Early research experiences for students in Computational Science, Data Science, and Statistics. Data Mine has become more than just a program and is now a full-fledged model for student engagement. The Data Mine . Students who participate in the Data Mine enjoy many benefits:

- The Data Mine model empowers the students to excel early in their careers.
- The communal environment is conducive to student collaboration. The students can easily share their ideas, perspectives, tools, and approaches while problem solving
- The Data Mine equips learners from any major or program to develop data competency skills within their field of specialty. .
- The diverse range of majors increases the students' ability to solve real-world challenges.
- Students in the program can make sense of large, complex data sets using model data analysis environments, tools, libraries, and methodologies.
- These skills allow graduating students to differentiate themselves from their peers as they seek job opportunities.

CARING CULTURE

ACTIVE ACADEMICS

EXTRAORDINARY EXPERIENCES

Associate Dean's Corner

Dear Members of the School of Engineering and Computer Science (SECS) Community,

You might have noticed the theme of this newsletter is focused on highlighting our students' achievements. We are thrilled to share the latest developments and accomplishments from our students. Our students have truly been shining, whether it's working on exciting data science projects with AstraZeneca and Evonik or presenting research on machine learning and procedural generation at prestigious conferences. These experiences are helping them build skills and connections that will serve them well in their careers.

We have our new 2024-25 Engineering Ambassadors, who will play an integral role in student recruiting and outreach. These outstanding students will share their experiences with prospective students, inspiring the next generation of engineers, computer scientists, and construction managers.

Our Senior Design Teams have started the preliminary work on their projects, such as the Lake Talahi Dam project, design of a Formula One car, and the Thermosiphon project. These projects provide hands-on, real-world experience that will prepare our students for successful careers in engineering and beyond. You will be getting monthly updates on their progress.

Enjoy reading this newsletter and please send your suggestions, comments and noteworthy news that can be included in the upcoming issues.

Sincerely,

Suresh Immanuel, Ph.D., P.E.
Associate Dean and Professor
School of Engineering and Computer Science

INTRODUCING OUR 2024-25 ENGINEERING AMBASSADORS

Engineering Ambassadors are Engineering and Computer Science students who assist the School of Engineering and Computer Science with recruiting and outreach efforts. They spend time each week sharing their UE experience with prospective students by writing cards or by meeting with them while they are here on a campus visit.

Pictured (Left to Right):

Ghaya Mtimet (CS),

Tiffany Martindale (CS),

Luke Gramza (CE),

Patrick Albright (ME),

Christopher Martin (ME),

Jillian Tretter (CE), and

Anelise Fellers (CS)

IMPORTANT DATES

October

1 FASFA opens

12-15 Fall Break *no classes*

17 Majors & Minors Fair 4:00 pm (Eykamp)

18 Midterm Grades are due

19 Purple Visit Day

21 Late Start Classes Begin

21 Advising for Winter Intercession, Spring & Summer begins

28 Registration for Winter Intercession & Spring begins

November

1 Admission Early Action Deadline **Purple Visit Day**

8 **Last Day to drop with a course with a "W"**

Attention Engineering Alumni

The UE School of Engineering and Computer Science is seeking Alumni to assist in various areas in support of the school:

- Guest Lectures
- Recruitment
- Adjunct Professors
- Serve on Advisory Councils

If you are interested in supporting SECS in any of the areas listed, please contact Dr. Suresh Immanuel via e-mail (ss476@evansville.edu).

Senior Design Teams

CE 495 SENIOR DESIGN TEAM

This year's Civil Engineering Senior Design team is comprised of 5 members: Nicholas Collins, Baylee Essert, Henry Hall, Aiden Krutchen, and Erika Phillips. The team is working on the Lake Talahi Dam.

UE ACES RACING TEAM

This year's Aces Racing Team is being led by 5 ME Seniors: Kaleb Werner, Nick Taylor, Sam Morgan, Jakob Grundbacher, Dani Santos Lopez, Gracie Davidson, Kaylee Ivy, & Owen Bryant. They will be working on a Formula One Car Design.

THERMOSIPHON TEAM

This year's Thermosiphon team is being led by two seniors: Essa Ahmed and Swarup Bhatta. They are getting things setup to start their research.

More 2024 Summer Highlights

SECS students were asked "What did you do this summer?" Several of our students shared their summer experiences with us. It is exciting to see the great work our students are doing in their communities! Here are a few of the stories shared with us.

Beau Baldwin
Civil Engineering Class of 2028

This summer I interned at SABIC, assisting their Engineering and Project Management department with turnaround activities. Here's a picture of a small group of us (I'm in the bright blue jumpsuit) inspecting a steam line used in the manufacturing process of plastic pellets. SABIC is the primary plastic provider for John Deere green plastic and DeWalt yellow plastic as well as responsible for shipping different kinds of plastic worldwide.

Andrew Thompson
Computer Science /Statistics and Date Science Class of 2027

I This summer, I had the opportunity to present a research paper at the 24th Annual IEEE International Conference on Electro Information Technology in Eau Claire, Wisconsin. My paper, titled "Text Extraction and Classification for Automated Balance Sheet Data Entry," focused on utilizing machine learning techniques to streamline accounting data entry. Collaborating with Dr. Maxwell Omwenga and Dr. Benjamin Johnson, the paper explored how traditional machine learning techniques could be used as a solution for automating balance sheet data entry. This research was published over the summer, after the conference.

I also attached a photo of myself (center) and some others from UE at the conference!

Pictured (Left to Right): Dr. Maxwell Omwenga, Andrew Thompson, Alejandro Malla.

Luke Gramza
Civil Engineering Class of 2026

This summer I interned with HNTB at the Indianapolis Office with the water services department. Much of the work I did was associated with the Lead Service Line Replacement operation with the Evansville Water and Sewer Utility. Working alongside amazing engineers for my second summer in a row provided me with critical professional development skills and continued learning of the water utility field. I am looking forward to working at HNTB next summer!

We took this group photo of HNTB Interns at the Soldiers and Sailors Monument in Downtown Indianapolis.

Reese Doran
Construction Management
Class of 2028

Over the summer I traveled to Europe where I was able to visit London, Dublin, and North Wales. It was a fantastic experience, and I can't wait to go back whenever I go to Harlaxton.

ARE YOU CONSIDERING HARLAXTON?
Harlaxton students come from all walks of life, different universities, and can study with us from gap year onward. Have an immersive study abroad experience in an inspirational setting. It will be one of the best decisions you ever make! Most SECS Students go in the Fall of their Sophomore year. Apply now for Fall 2025.

HARLAXTON

Astrid Miranda Named 2024 ASCE Student Ambassador

Civil Engineering Junior, Astrid Miranda, was selected to represent UE and other Region 4 Student Chapters to the ASCE. ASCE Student Ambassadors represent ASCE on their campuses and through social media, promoting Society events and resources that can help their fellow students advance their careers.

Astrid is one of 27 ASCE Student Ambassadors this school year, ready to share with the world all the coolest parts about being a civil engineering student in 2024.

Computer Science Students Present Research Projects

Name: Aaron Tucker

Title: Procedural Generation of Harmonic Information Utilizing Wave Function Collapse

Abstract: Generative tools used as aides alongside developer created content for subjects such as textures, game maps, and audio, have seen intense growth within the last decade due to the increasing demand to generate these resources quickly alongside advancements in machine learning and novel algorithms. Despite major advancements in these fields, the growth in the subdiscipline of procedurally generated musical content, such as procedurally generated compositions, has stagnated, and remains inaccessible or unfeasible in a number of ways. This paper attempts to address this issue by illustrating and developing a novel approach to procedurally generating music, done through specialized application of the Wave Function Collapse (WFC) algorithm, which generates highly complex procedural content resembling relatively small input data. This allows novel information with a specific harmonic style to be generated from data alone or controlled extensively by a user, or a combination of both. While this process does not account for more intricate details of musical information, such as melody and dynamics, there is potential in expanding this process to account for these finer details and shows promise in aiding composers with preexisting musical knowledge in a positive manner as well as further investigating the potential benefits of constraining compositional processes.
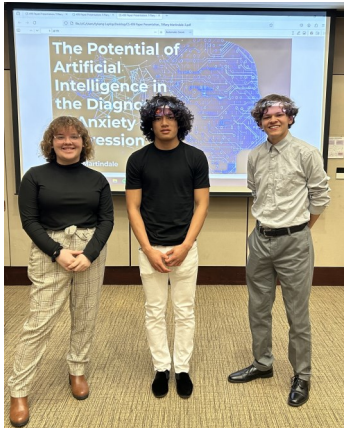
Name: Tiffany Martindale

Title: Unveiling the Potential of Artificial Intelligence in the Diagnosis of Anxiety and Depression: Bridging Gaps and Ethical Considerations

Abstract: Mental Health disorders affect nearly 12.5% of the global population, constituting a significant stress within the healthcare system. Anxiety and depression are the most prevalent disorders and require timely and accurate diagnosis for the securing of effective treatment. The integration of artificial intelligence (AI) into mental health diagnosis displays promising changes and answers to challenges in accuracy, accessibility, and efficiency. However, several gaps exist, including the practical integration of AI into routine clinical practices, ensuring model interpretability, and various ethical concerns. This research aims to bridge these gaps, providing insights into the development and deployment of AI tools for mental health diagnosis. A synthesis of related work proves AI's unlimited potential in improving mental health diagnosis, focusing on expert involvement, ethical considerations, and diagnostic accuracy. The methodology employs a Feedforward Neural Network (FNN) using two data sets from the U.S. Department of Health and Human Services. Performance evaluation using the FNN demonstrates a very strong correlation of 0.99 between reported symptoms of anxiety and/or depression and the receiving of mental health care. The findings aim to contribute practical and scalable solutions to improve mental health outcomes, reduce stigma, and enhance the overall well-being of individuals worldwide.

TIPS FOR ACADEMIC SUCCESS

UNIVERSITY OF EVANSVILLE
PUBLIC SAFETY TIPS
Staying Safe on Campus
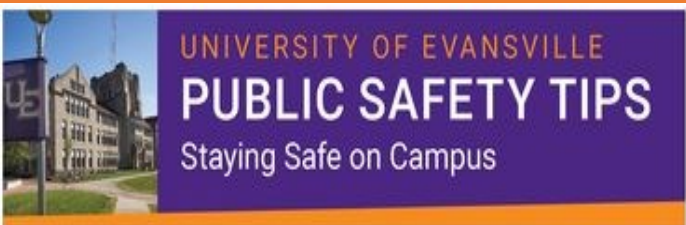
Campus safety is key to making sure everyone has a secure and supportive college experience. By following these tips while navigating the campus— like walking in pairs, using well-lit paths, and utilizing campus safety apps— you can help protect yourself and keep our community safe and healthy.

1. Walk in pairs!
Avoid walking or jogging alone, and avoid working or studying alone at night in computer labs or isolated areas of campus buildings.

2. Know the location of assistance poles
Assistance telephones have been placed in strategic locations around campus. They are recognizable by the blue lights on top and "Assistance" on the sides of the poles. Car problems? Need a ride? Not feeling well? Use the assistance poles.

3. Why walk? Ride instead!
If working or studying late, there is no need to walk alone. Call Public Safety for escorts across campus late at night.

4. Give Public Safety a heads-up!
Call or chat with Public Safety and let them know if you are going to be working late at night after regular hours or on weekends.

5. Stay in well-lit areas
For your safety, try to stick to well-lit areas while walking on campus—they help you see and be seen more easily. Bright, well-lit spots also make the environment feel safer and more inviting.

6. Stay aware of your surroundings!
Avoid distractions like texting or listening to loud music. Stay alert to what's happening around you.

RAVE GUARDIAN
Stay safe on campus.

Download the app today!

You can reach the Office of Public Safety via the RAVE Guardian app.

No matter what situation you're in, UE's Office of Public Safety is one click away from providing the help and resources you need — 24 hours a day, seven days a week.

Office of Public Safety
On-campus: 6911
Off-campus (including Stone Center): 812-488-6911
Public Safety (non-emergency): 812-488-2051
Facilities Management: 812-488-2775

UE University of Evansville

SCHOLARSHIP OPPORTUNITY

Indiana Department of Transportation

News Release

INDOT seeks applicants for Engineering Scholarship

INDIANAPOLIS, Ind. – The Indiana Department of Transportation (INDOT) is seeking applicants for its Engineering Scholarship Program. Recipients receive financial assistance, as well as opportunities for paid employment during summer breaks and upon graduation.

Students must be accepted or enrolled full-time in one of Indiana's accredited Civil Engineering schools. The program must also be certified by Indiana's Accreditation Board for Engineering and Technology (ABET). Eligible universities with ABET-certified Civil Engineering programs include Purdue University, Purdue University Fort Wayne, Purdue University Northwest, Rose-Hulman Institute of Technology, Trine University, University of Evansville, University of Notre Dame, University of Southern Indiana, Indiana State University and Valparaiso University.

INDOT's scholarship program offers $3,125 per semester or $2,083 per trimester for up to five years of post-secondary Civil Engineering education. Scholarship funds may be applied to educational expenses, fees, and books. In return, recipients have the opportunity to work at INDOT in full-time, paid positions during summer breaks and upon graduation.

Learn more about the INDOT Engineering Scholarship Program and the application process at indotscholarship.in.gov. Applications for the 2025-2026 school year must be emailed or postmarked by Sunday, December 31, 2024.

INDOT ENGINEERING SCHOLARSHIP
APPLY TODAY!

DEADLINE **DEC. 31**

$3,125 PER SEMESTER OR $2,083 PER TRIMESTER FOR UP TO FIVE YEARS OF POST-SECONDARY CIVIL ENGINEERING EDUCATION

PAID SUMMER INTERNSHIP

PRIORITY HIRING AFTER GRADUATION

INDOTSCHOLARSHIP.IN.GOV