



HensonNews

SPRING 2023

Produced by Salisbury University's Henson School of Science and Technology

From the Henson Dean's Office



Greetings from the Dean's Office of the Henson School of Science and Technology!

It is no secret that the curriculum in science, technology, engineering, and mathematics is challenging. The faculty in the Henson School have always held

high standards of achievement and rigor, ensuring that our students continue to be sought after by employers and graduate schools. A key component of maintaining those standards is providing support for those students who struggle. The faculty in the Henson School have been implementing several academic innovations, both curricular and extracurricular. This edition of our newsletter describes just some of those efforts. If you would like to learn more about how you could help support the students of the Henson School, please email hensonschool@salisbury.edu and have a great spring!

– Dr. Michael Scott, Dean



The Chemistry Support Center

The Chemistry Support Center (CSC) was established in fall 2021 as a standalone facility in Blackwell Hall 235 to offer tutoring and academic support for all students enrolled in chemistry courses at SU, regardless of major. The CSC is open Monday through Friday during both spring and fall semesters. Students can simply drop in during open hours to get assistance with their coursework. They do not need an appointment. The CSC hours are linked to on the sidebar of Chemistry Department website – www.salisbury.edu/chemistry.

The CSC is staffed by chemistry faculty and student tutors. We provide approximately 30 hours per week of homework help, study support and tutoring for most chemistry courses, particularly for lower division courses such as CHEM 101, 121, 122, 221 and 222. The CSC complements faculty office hours and helps to lower the barrier for students to get help with their classes. Because of the central location on campus and open hours, students can simply show up anytime they need help or need a place to study.

In addition to help with classes, the CSC provides a comfortable place for students to study, with whiteboards and periodic tables, as well as computing and printing resources. In collaboration with the Center for Student Achievement, we offer study skills workshops for all CHEM 121 students at the beginning of each semester. Students are introduced to all the support resources available to them on campus. They also learn about effective study strategies, how to find information for their courses, and how to develop a study plan for the semester. In the evenings and on weekends, the CSC provides space for Chemistry Department social events, including the Cort Scholars Celebration and movie nights!

Continued

Use of the center has skyrocketed since its opening, with an average of nearly 400 student visits per month. Feedback from both students and faculty has been overwhelmingly positive. Last fall, almost 55% of enrolled chemistry students stopped by the CSC at least once for support. The largest groups of student users are from the pre-nursing, biology, exercise science and chemistry programs. CHEM 121 and 221 are the most popular courses for which students seek help.

With the CSC open and thriving, we are now beginning to collect data on the impact that the CSC has on student success in chemistry courses. We hope to share that data with Henson School faculty in the near future. Stay tuned! We would greatly appreciate Henson faculty spreading the word about the CSC and encouraging their students and advisees to stop by for help with their chemistry coursework.

Discover the Math Emporium

The Math Emporium is SU's math and computer science tutoring center. Located in the Guerrieri Academic Commons 201, the Math Emporium is open for walk-in tutoring of our 100- and 200-level MATH and COSC courses. Tutoring sessions begin the second week of classes, and we are staffed from 9 a.m.-8 p.m. Monday through Thursday and 8 a.m.-4 p.m. on Fridays.

The Math Emporium saw an influx of students last fall. With over 600 visits from students from more than 20 courses throughout the semester, students are utilizing the Math Emporium for help understanding concepts, completing better homework assignments and achieving greater success in their courses. Our largest groups of attendees come from MATH 140: College Algebra and Trigonometry and MATH 201: Calculus I, with significant groups of students from MATH 155: Modern Statistics with Computer Analysis, MATH 160: Introduction to Applied Calculus and MATH 135: College Algebra.

Many of our students are repeat visitors, seeking assistance multiple times throughout the semester, highlighting that once they have visited the Math Emporium, they are likely to continue to use this resource.



ROBOTICS NEWS

Undergraduate Research Projects in the R.E.A.L. Robotics Lab

Exploration of Dead Wheel Odometry on Wheeled Robots

Corey Phillips

The primary goal of this research project was to explore motion of wheeled robots by diving into PID controllers, dead wheel odometry, and to create a simulator of motion for wheeled robots.

Weed Removal Through Laser Technology and Robotic Automation

Daniel Bradley

The primary goal of this research project was to explore an alternative method of weed control via a laser-mounted robot that can target and destroy weeds through automation. During the semester, they designed and prototyped a four-wheeled robot that use laser technology as a possible method of weed control. The robot is now ready to be used for other projects, property of the REAL Robotics Lab.

How to Build an Entire CPU with Logisim Software

Zakary Holliman

They started building the physical version using hardware components. They researched and studied several advance topics of computer architecture and embedded systems.

Wetland Litter Detection

They are creating an algorithm that could detect the presence and location of litter in multispectral images taken from a drone. They began by creating a script that aligns the different spectral bands into RGB and infrared images. They used the library developed by Micasense, the manufacturers of the camera.

ROBOTPuppet: Use of 3D-Printed Puppets to Drive More Complex and Articulated Manipulator

ROBOTPuppet is a method to create inexpensive, tabletop-sized robot models to provide teleoperation input to full-sized robots. It provides a direct physical correspondence from the device to the robot, which is appealing because users form an immediate "mental mapping" of the input-output behavior. They observed that untrained users can immediately exploit tactile and physical intuition when controlling the puppet to perform complex actions the target robot. A prototype ROBOPuppet is built for a 6DOF industrial manipulator and tested in simulation and on the physical robot.

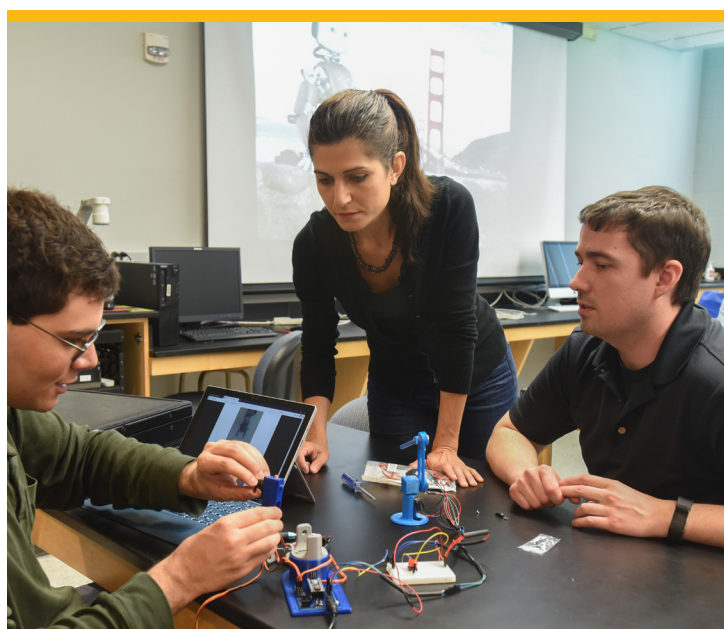
Robots Under Construction

Cooler Cooler Cooler is designed to be an autonomous robot that follows a user's phone based on the phone's GPS location. This wheeled robot can drive around a cooler filled with drinks to various locations on a flat surface and possibly various terrains.

Fedor is an autonomous toy Nerf turret that can shoot nerf bullets to an object given by the user as input. The robot is to work autonomously and recognize this object in its vicinity and then target it.

Garbot is a robot that can drive and pick up small pieces of litter and deliver it to a disposable area. The robot consists of a 3D-printed, four-wheeled car with a 3D-printed mobile manipulator plus a gripper mounted on it.

Sub Fish is a novel design and cost-effective robotic fish that is capable of exploring and navigating through underwater environments. The robot has a streamlined and thin body shape, allowing it to move efficiently through the water. It is powered by three electric servo motors and is driven autonomously by the Arduino. The robot is equipped with two ultrasonic sensors for detecting obstacles.



Franchi Research Project with External Collaborators

Dr. Giulia Franchi, Computer Science Department, was awarded a grant by the Bailey Wildlife Foundation for the project “A Global Defense for Coral Reef Wildlife: Creating Carbon-Negative Habitat – Year Four” – it is anticipated that the project will be funded for another year.

Franchi has worked as a co-principal investigator on this project for a year, integrating a calcium carbonate precipitation system into an automated control system and designing the Coral Defense app to control the full system from a cell phone. Partners on the project were Dr. Elizabeth North, Dr. Jeff Cornwell, Dr. Michael Gonsior, Dr. Matt Gray, Dr. Andrew Heyes, Scott Hunsicker, Dr. Hali Kilbourne, Dr. Yantao Li, Dr. Willam Nardin, Michael Owens, Dr. Allen Place, Dr. Johan Schijf, Dr. Greg Silsbe and Julie Trommatter from University of Maryland Center for Environmental Science; Dr. Ryan Hoover from Maryland College of Art; and Dr. Khrupa Vijayaragavanm from University of South Dakota.

Gulls Robotics Club Activities

The VEX Robotics Competitions presented by the Robotics Education and Competition Foundation is the largest and fastest growing middle school, high school and university robotics program globally. Each year, an exciting engineering challenge is presented in the form of a game. In this competition, teams design, build and program robots to compete at tournaments. At tournaments, teams participate in qualifying matches where two randomly chosen alliances of two teams each compete for the highest team ranking. VEX teams design and build a robot to play against other teams in a game-based engineering challenge. Classroom STEM concepts are put to the test as students learn lifelong skills in teamwork, leadership, communications, and more.

CLUB ACTIVITIES INCLUDE:

- **February 4, 2022:** Hosted a virtual high school competition in SU
- **February 5, 2022:** Hosted an in-person – but closed to public – University competition. The GULLS team competed and won with the UMBC team.
- **February 13, 2022:** The GULLS team went to Queens, NY, to compete.
- **February 27, 2022:** Hosted a High School Vex tournament: 19 teams participated.
- **March 13, 2022:** Hosted a University School Vex tournament: 12 teams participated.
- **May 2, 2022:** The GULLS team went to Dallas, TX, to compete on the 2022 VEX Robotics World Championship where they classified 17th over 40.
- **January 26, 2023:** The GULLS team went to Pennsylvania to compete.
- **February 10, 2023:** The GULLS team went to Queens, NY, to compete.
- **February 18, 2023:** Hosted a High School Vex tournament.
- **February 19, 2023:** Hosted a University Vex winter tournament.
- **February 25, 2023:** The GULLS team went to Indiana to compete.
- **April 26, 2023:** The GULLS team plans to go to Dallas, TX, to compete on the 2023 VEX Robotics World Championship.

A Census of Stellar Companionship

Henson Seminar with Nick Troup

Wednesday, March 29

Henson Science Hall 243, 4 p.m.

The fifth phase of the Sloan Digital Sky Survey (SDSS-V) is now in full swing with its first public data release, DR18 (the 18th overall for SDSS), going live this month. New robotic hardware now installed on the telescopes in both hemispheres will enable SDSS-V to be the first truly all-sky spectroscopic survey. SDSS-V builds upon a legacy of data going back over 20 years, all available to the public, so if you are looking for large datasets to play around with, go to sdss.org to see all Sloan has to offer.

As leader of the Milky Way Mapper Binaries Science Working Group, Dr. Nick Troup, Physics Department, is looking forward to future data releases where he'll be able to take advantage of multi-epoch spectroscopy to characterize a variety of binary star systems, as well systems with substellar (i.e., "failed star") companions. To hear more about this, come to the Henson Seminar on March 29!



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