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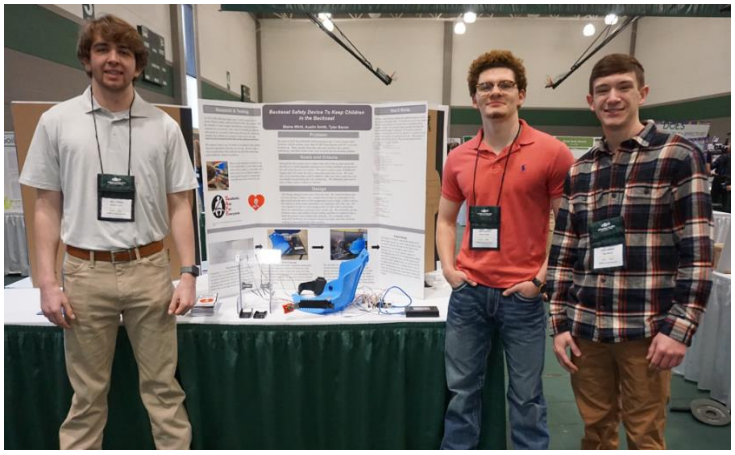
On Saturday March 5th, the Engineering Senior Design students presented their projects at the Central Alabama Science & Engineering Fair at UAB. Our students began the school year by brainstorming hundreds of problems in order to create live-improving solutions. The students did an incredible job this year of creating their final working prototypes. I have attached a table with pictures and descriptions of the students' problems and solutions. When you read through these design descriptions, you may wonder why these solutions have not already been invented. These students have worked extremely hard, spending countless hours researching, designing, 3D modeling, programming, building, and troubleshooting their solutions. We are extremely proud of the hard work and dedication of this group in their effort to improve the lives of others. The first four teams will move on to compete in the Alabama State Science and Engineering Fair. Please scroll down to read about our students' amazing projects, and be sure to congratulate them on their hard work.

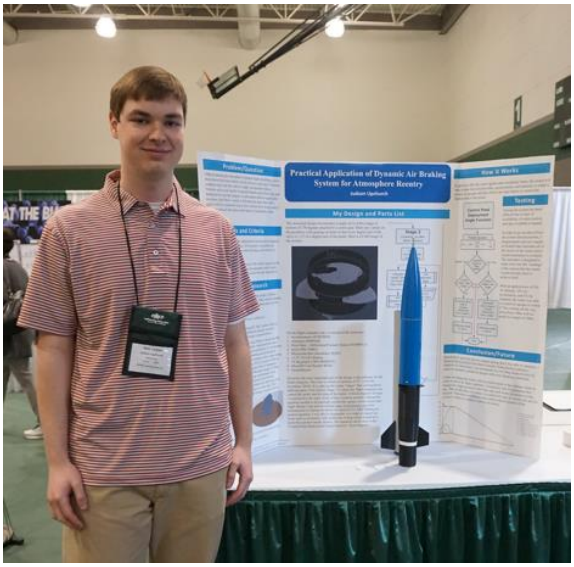
Project Team	Project Description
 **Emergency Solar Power Battery** Adam Ruf received 1st place in the Energy and Transportation category. He advanced to the State Science and Engineering Fair.	Have you ever been without power for a large amount of time? Adam has designed a possible solution. In severe storms many people can lose power. Adam engineered an easily transportable solar tracking battery system. This system can be provided to residences to place in their yards to generate power during the day by having a solar panel track the sun and charge up a set of batteries. At night the system can be rolled into the house and can be utilized to power LED lights, radios, and charge electronics.
 **Automatic Stop Sign Intersection** Shelby Stowe, Hollis Prosser, and Kaylee Brooks received 3rd place in the Energy and Transportation category. This team advanced to the State Science and Engineering Fair.	Have you ever pulled up to a 4 way stop sign intersection and been unsure of when it is your turn? Shelby, Hollis, and Kaylee designed a system that monitors the intersection and evaluates whose turn it is. They utilized a system of ultrasound sensors to detect the cars and then created a program to determine the correct order for cars to proceed through the intersection. Their system includes LED lights around the sign that change from red to green when you should proceed.



Children's Back Seat Safety System

Tyler Bacon, Blaine Whitt, and Austin Smith received 2nd place in the Energy and Transportation category at the Central Alabama Regional Science and Engineering Fair. This team advanced to the State Science and Engineering Fair.

These students designed a system that would notify drivers/parents if parents if their child becomes unbuckled in the back seat or if they come out of the seat. This team utilized a sensor to ensure that the seat belt was correctly buckled. They also included a pressure switch that would indicate if the child was no longer seated. If either of these two devices are triggered, indicator lights on the dash will light up to alert the parents/driver. Future upgrades will notify parents if the child is left in the car by mistake.



Rocket Control System

Judson Upchurch received 2nd Place in the Engineering Category at the Central Alabama and Regional Science and Engineering Fair. He advanced to compete in the Alabama State Science Fair.

Have you seen what SpaceX has done in the rocketry world? Judson has designed his own rocket flight control system. This device utilizes a series of sensor to predict the rocket's height. Judson designed and created a deployable petal system that can be activated to slow down the rocket in order to reach a specific altitude. This system also includes a controllable parachute that will control the rocket's speed for landings.

Plastic Bottle Recycling System

Anna Eubanks received honorable mention in the Environmental category at the Central Alabama and Regional Engineering and Science Fair.

Have you ever noticed how many plastic bottles that accumulate daily in a school, concert, or stadium? Anna did, and she designed a system that will allow users to separate the bottle caps from the bottles. The bottles go through a shredding device that grinds the bottles into small recyclable pieces. She tested her device and it reduced the volume by 80%.

Automatic Golf Ball Feeder System

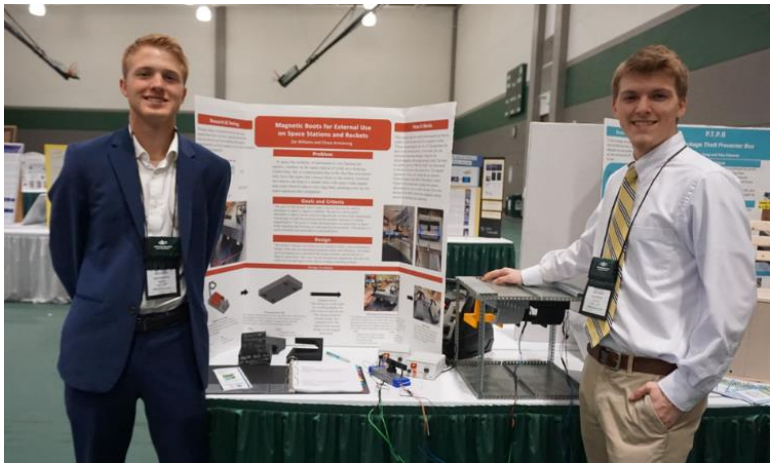
Carter Parker, Owen Swinney, and Addison Lockhart received honorable mention in the Engineering category at the Central Alabama and Regional Engineering and Science Fair.

Tired of having to tee up your golf ball while at the driving range? This team has your solution. They have engineered a device that holds a large number of golf balls. The user activates the device with a foot switch – when the device is activated, one ball is fed and placed onto the tee, where it waits to get hit by the club.

Arthritis Assistive Device

Laura Phillips received honorable mention in the Medical Category at the Central Alabama Regional Science and Engineering Fair.

Do you know someone who suffers with arthritis? Laura does and she was determined to find a way to provide some help to her grandmother. Laura designed a system of devices that makes holding pens, pencils, toothbrushes, forks, spoons, paintbrushes, and other objects comfortable for the user.



Magnetic Space Boots

Chase Armstrong and Zach Williams received honorable mention in the Engineering Category at the Central Alabama Regional Science and Engineering Fair.

Chase and Zach are working on a project to present to NASA. They designed a system that would allow an astronaut to walk on the outside of a structure using magnetic boots in space. This system is designed to ensure that one of the boots is always magnetized and to prevent the user from accidentally disengaging both boots at the same time.

Dog Anxiety System

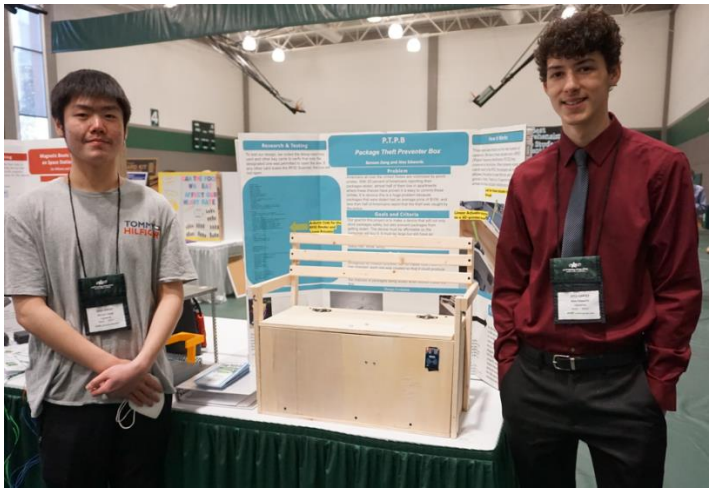
Morgan Greenhaw and Savannah Ryle presented their project in the Engineering Category at the Central Alabama Regional Science and Engineering Fair.

Does your dog have anxiety? Do you feel guilty leaving your dog home alone? Morgan and Savannah were concerned about this issue. They designed a device that can listen to see if the dog is barking. Their device gives the dog a treat when it has gone a set period of time without barking. They are planning to add an owner notification and camera system onto their design.

Concussion Notification System

Sarah Prince, Madison Morris, and Fran Mann presented their design in the Medical Category at the Central Alabama Regional Science and Engineering Fair.

Do you know someone who has suffered from a concussion? This team designed a notification device that can be worn by the user. The device utilizes accelerometers and an LED notification system that alerts users if they have experienced a significant impact to their head and need to be checked out by a doctor. Future improvements will include a self-inflating air bag system to help to prevent a possible concussion.



Package Security System

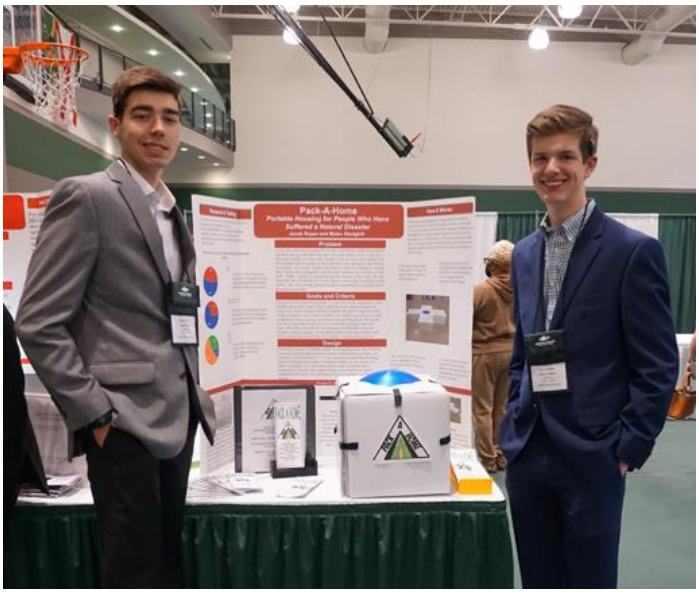
Benson Jiang and Alex Edwards presented their design in the Engineering category at the Central Alabama Regional Science and Engineering Fair.

Do you have a lot of packages delivered? Are you concerned about package theft? Benson and Alex designed a package security box that is disguised as a bench. The bench sits on your porch and will only open for the owner and delivery drivers. Delivery drivers swipe a secured card that will unlock the box and allow them to securely place your packages inside. Future additions to the design will send a notification to the owner showing that a delivery had been made.

Heat Stress/Stroke Notification System

Madelyn Brasher presented her design in the Medical Category at the Central Alabama Regional Science and Engineering Fair.

Do you know someone who has suffered from heat stroke or heat stress? Madelyn does, and she wants to make sure that it can be prevented. Heat stroke/stress is a serious problem in the summer, especially in the South. Madelyn has designed a device that will constantly read the temperature of the user. The system will notify the wearer with a series of lights and LEDs if their body temperature is rising into a condition that could cause heat stress or heat stroke.

 **Runner Safety System** Mitchell Phillips and Teague Edwards presented in the Engineering Category at the Central Alabama Regional Science and Engineering Fair.	Have you ever gone running at night? Mitchell and Teague designed a system that monitors for car headlights from the front and rear. When car headlights are detected, their system activates an LED lighting system to warn drivers of the runner in front of them. This system also notifies the runner if a car is approaching them from behind.
 **Easy Set-Up Emergency Shelter System** Malen Stodghill and Jacob Roper presented in the Engineering Category at the Central Alabama Regional Science and Engineering Fair.	Tornadoes and hurricanes are prevalent here in the South. Many people can suddenly lose their homes in these disasters. Jacob and Malen were concerned about this problem and set out to design a temporary housing system that could be easily transported and set up in disaster areas. This shelter is a box that contains furniture and necessary supplies. The box unfolds into a fairly large temporary home with a solar dome roof to provide power. This shelter can be utilized until homes can be rebuilt.

Baseball Glove Injury Prevention Device
Zach Simpson presented in the Engineering Category at the Central Alabama Regional Science and Engineering Fair.

Ever wonder how catchers can catch those 90+ mph fast balls without injuring their hands? Zach is a catcher and knows the problem first hand. Zach designed and engineered a device that goes inside the catcher's mitt to cushion the impact of the baseball to the catcher's hand.

Building Safety Alert System by Cole Bailey

Ever been in a hotel, hospital, or large building when tornado sirens go off? Cole designed a Building Safety Alert System. His system will be placed in large buildings and schools to alert occupants of the proper exit to take in emergencies. In case of a fire, it would direct people to the exits that would be away from the fire. In case of a tornado, it would direct people to the designated safe areas. In a shooting situation, it would direct people away from the gunfire.

Wheelchair Shopping Cart Attachment Device by Elijah Bell, Kesler Rogers, and Colby Little

Do you know of anyone who is in a wheelchair? This team designed a device that would make shopping easier. This device connects a wheelchair to a standard shopping cart to make shopping easier. This device also includes an expandable reaching device that will allow users to access groceries from higher shelves.