Winners
Thomas J. and Sandra H. Malott Innovation Award
Senior Capstone Design, Fall 2014

Out of 21 teams, 5 finalists selected by external review judges and students, winners selected by external review judges.

First – Doggie 6th Sense – Obstacle Alarm Trainer for Blind Dogs.

The purpose of Doggy 6th Sense was to create an object sensing dog harness to allow blind dogs to navigate the world independently. The device consists of a service dog harness, two ultrasonic sensors, and a power box unit. A single 9-volt battery is the source of power for the device. When the device is switched to the ‘ON’ position, the ultrasonic sensors will detect objects within a 15-30cm range. As the dog approaches the object a beep sound can be heard from the power box. The harness can be worn comfortably by the dog at all hours of the day, as there is a sleep mode if the dog is not moving. This harness allows blind dogs to live independent lives.


Our project is a bike rack that uses vertical space to store bikes. The intent is for the Skyrack to be used in public and commercial areas where ground space is limited. The bike is lifted overhead to allow for pedestrians to utilize the space below. It uses an assisted counterweight system to relieve the user of having to lift the bike. A rotational dampener controls the descent velocity of the counterweight making the operation of the system safe.

The user is able to lock his/her bike while it is in the lifted position with their provided bike lock. This prevents anyone other than the owner of the bike to tamper with the Skyrack. A foot pedal is pressed to lower the bike into a position where the user is within arm’s reach of the bike allowing for them to pull the bike down the rest of the way. When the bike is lowered an automatic locking mechanism keeps the bike in the down position while the user removes their bike.

The Skyrack contains 5 different subsystems that are uniquely designed to serve a specific function while working together to create a simple yet elegant design.

Third – Vinyl Revival – Aesthetic Wall-Mounted Vinyl Record Player.

There is a growing market of younger vinyl enthusiasts who are starting to collect records. The new audience has a huge interest in the aesthetics of the player and on the artistic value of the physical record itself. It is because of this desire that we have designed a wall-mounted record player that will play and display the vinyl. The design features a custom made linear tracking arm that secures the vinyl as it spins while in a vertical position. Inside the tracking arm, the needle cartridge glides
along two tracks as it reads the record. This system will ensure that the appropriate force is applied by the needle into the record groove but will minimize the forces along the track, which could cause wear on the record. The housing is a round shape made of wood for both aesthetic and acoustic purposes. It is large enough to store all electronic components, while remaining small enough to enhance the beauty of the records. The player is able to spin the record at 33 1/3, 45, and 78 rpm, takes advantage of Bluetooth technology, and uses rechargeable batteries to allow for mobility and freedom from cords.

**Student Choice Award – Keady’s Kleaners – Autonomous Robot for cleaning Mackey Arena.**

An automated robot that can remove trash from the stands of Mackey Arena and push them to the aisles for easy removal by cleaning staff. The robot uses proximity sensors to maintain appropriate distances from seats and walls, is able to navigate the complex shape of Mackey Arena, and can change shape to pass obstacles such as stairs.