

Multidisciplinary teams of graduate students in engineering, management, industrial design, and textiles engaged in 10 market-driven projects. During the semester, each project team must research and understand market needs, conceptualize and design a new solution, develop and prototype the relevant product/service components, and create a viable go-to-market plan for their new solution. Under the direction of the PIL faculty group, teams take a learn-by-doing approach to critical tasks such as voice of customer, technical analysis, concept design, and prototyping. The projects showcased tonight reflect new product ideas that address real market needs through innovative solutions. The summaries below highlight the innovation challenges faced by each team. We hope you enjoy interacting with the teams and seeing their ideas!

Team #1 – “Pack Tracker” – Animal Activity Monitor

This project is designing a low-cost pet activity monitor that will enable pet owners to achieve a healthy lifestyle for their dogs. Pet owners gain as well since their exercise level can increase with a more active pet. When partnered with a pet food company, the innovative pet monitoring system helps promote a healthy pet lifestyle through increased activity, better eating, and easy tracking of health improvements.

Team #2 – “Tueri” – Bicyclist Safety Enhancement

Biking safety is a major concern for millions of bicyclists. Knowing which bike routes are more safe, plus the ability to detect and avoid possible collisions from approaching vehicles (even from behind), would address many of the safety issues associated with biker accidents and injuries. The team’s concept improves cyclist visibility, devises an innovative approach to sense oncoming traffic, and promotes a safety-conscious sharing of bike route information within the cycling community.

Team #3 – “Notch” – Scoring Solution for Corn Hole Game

Corn Hole is a popular game played throughout the country at football games, family gatherings, and a variety of outdoor venues. Despite the game’s relative simplicity, a common problem is the inability to keep track of accurate scores during play. The objective is to develop an easy-to-use scoring system whereby players can confidently track their corn hole scores, even when game play extends over a long time period with interruptions and the variety of distractions often encountered during a corn hole contest.

Team #4 – “Human Power” – Power Supply and Physical Storage for Long-Distance Cyclists

Avid bicyclists taking long-distance rides often need power for a variety of devices. Lighting, GPS devices, and cell phones are all useful for performance and safety, but drain power over the course of a long ride. This becomes particularly problematic if riding an unfamiliar route, or during night. The team’s solution uses the cyclist’s movement for controlled power generation, with the added feature of physical storage.

Team #5 – “Dropark” – Private Parking Space Sharing

Short-term parking is problematic in many urban areas. Besides public garage space or paid street parking, many privately-owned spaces could be shared (for a fee) with those looking for a place to park. An innovative parking solution gives commuters the ability to search available private parking spaces in real time, based on their location, on a short-term basis. A smart app allows parking space owners to set flexible rates and availability schedules, with automatic detection of parking space usage.

Team #6 – “PhysikAware” – Physical Therapy Monitoring Device

Physical therapy exercises are often assigned for patients to complete at home. Sometimes results are ineffective due to non-compliance or improper routines being performed. Physical therapists need a way to track patient activity and monitor progress. This project develops a new monitoring solution, based on smart sensors, which allows therapists to monitor a patient’s progress, detect the range of motion, record exercise data, and analyze the information to adapt treatment plans for an improved recovery process.

Team #7 – “Reveal” – Augmented Reality Game

Augmented reality technologies enable a new wave of fun and engaging interactive games. This project uses an innovative game app that enables augmented reality by viewing, with a smart phone, a specially tagged printed image on something simple like a restaurant menu or tray table paper. When the printed image is viewed with the eye, it appears as a normal image, but when viewed with the phone, 3-D game images are revealed that are animated and interactive. Users can play alone or compete with their friends.

Team #8 – “Skopa” – Smart Measuring Scoop

This project is developing an innovative “smart scoop” system used for serving, weighing, and recording food measurement and distribution. A primary application is precise measurement and data logging of specialty ingredients, such as nutritional supplements or cooking ingredients. It will also support nutritional studies, especially in developing nations, where experts need to provide evidence-based dietary advice based on accurate measures of various foods being prepared and distributed.

Team #9 – “Peace Link” – Seizure Monitoring Device

There are nearly 500,000 children in the United States with epilepsy, and thirty percent of new epilepsy cases each year in the US are children. This project is developing a seizure monitoring device that provides a durable, comfortable, and inconspicuous method to alert parents and caregivers of a child’s seizure onset. Improved monitoring can give parents/caregivers better ease of mind and sense of control over the child’s safety and progress with medication. A smart app allows real-time alerts, and seizure tracking over time.

Team #10 – “Rhythm” – First-Responder Safety Monitor

This project’s goal is to provide firefighters and their supervisory personnel with an integrated, intelligence-driven platform to enhance first-responder safety during an emergency call. The innovative solution consists of biometric heart rate sensors integrated into a firefighter’s suspenders to monitor and report heart rate and other cardiac events in real time. The information is displayed on a control center dashboard, enabling fire crew officers to take quick action if the firefighter’s health is in danger.

The faculty team includes Professors John McCreery (Management), Troy Nagle (Biomedical and Electrical Engineering), Ola Harrysson (Industrial Engineering), John Muth (Electrical Engineering & Power America), Christian Hölljes (Design), Jon Bohlmann (Management), and Tom Snyder (Electrical Engineering & NC IoT)

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