

IPD SPONSORED PROJECTS

The IPD program will be self-sponsoring four product development projects for 2009. Although 17 industry partners will be participating in the program this year, the directors have decided to fill our project roster with this new type of project. These projects have been brought to us by faculty and professional experts who recognized a need in the market for the projects proposed. Each project will be assigned 2 competing student teams. Each team will have a faculty advisor and an expert/mentor to look to for guidance. Participation in these project teams is especially encouraged in students who would describe themselves as self-directed, self-motivated, self-starters.

IPD Assisted Living Safer Kitchens As the US population ages there is a continually growing need for appropriate housing for seniors. Retirement Communities are being built in record numbers as senior citizens wish to live independently for as long as possible. Architect Joyce Lenhardt, whose firm Lenhardt Rodgers Architects in Ft Washington, PA specializes in the design of senior living environments has identified several areas in which the design of these facilities is constrained by the lack of appropriate product choices. One of these areas is kitchen design. The need for kitchen equipment and appliances with built in safety features becomes more and more apparent each time the firm designs a new facility.

A full service Retirement Community is also known as a CCRC which stands for Continuing Care Retirement Community. These have been developed to provide a continuum of care from Independent Living to Assisted Living to Nursing Home facilities all contained on the same campus. As residents age they may move from one level to another depending on their need for care. One of the gauges is the need for assistance in such Activities of Daily Living (ADL) such as taking medicine, dressing, or bathing. Residents are generally reluctant to move as it means downsizing to smaller accommodations and learning to live in a new place and all that comes along with living in a new place. Therefore, the trend today has been toward allowing residents as much as possible to "age in place" and to be able to stay in their Independent Living apartments for as long as possible. Kitchen safety is of large concern. As people age, they may become more forgetful or may develop physical limitations which make using the kitchen more difficult or less safe. The goal of this project is to understand these issues and develop a product which addresses the need.

IPD Chair for Autistic Students There is a known need for a chair for individuals with autism who engage in repetitive rocking behavior which creates a particularly high level of stress to the structure. This chair would need to withstand the rocking of the individual and also provide other sensory input in the process. Due to the force and tenacity of the behavior, the chair would also need to stay in place and ensure safety for the "sitter". Finally, this design would potentially suit multiple uses for individuals with autism who have similar but variable sensory needs.

Constituents: National Autistic Society, National Alliance for Autism Research, Families for Early Autism Treatment, Center for the Study of Autism, Eden House, Spectrum Center, and local groups such as the Autism Support Network

IPD Musical Instrument Tone Quality Device Beginning and intermediate students playing brass, woodwind, and bowed string instruments often produce a poor sound quality. Even if they practice on a regular basis, they may not be able to hear the quality of the sound they are producing

when playing their instrument. Without being able to recognize sounds as “bad” or “good” the student musician is less likely to improve. This problem may be addressed by designing a device or system that will provide immediate feedback. If the device or system can “hear” and recognize the quality of the sound; respond in a way that compares the student’s sound with the “ideal,” then the student can add “more air,” adjust embouchure, adjust bowing technique, etc. and recognize improvements to the sound.

While each musical instrument is unique, the basics of the new device will be the same: 1) Identify the characteristics that make the played note unique for a trumpet, an oboe, a clarinet, violin etc. 2) Store for reference the characteristics for an ideal sound for the instrument. As experts will say, every great musician has her/his unique sound. For example, the system may contain an “amalgam” or average characteristics of professional players. 3) The characteristics of the student sound (quantity and energy of harmonics for example) will be compared to the ideal. 4) Through some kind of real-time feedback, convey to the student player the differences and possibly suggest techniques for improvement.

Other points:

1. The feedback for this device is crucial.
2. This device should be of appropriate size and shape.
3. The analysis of the sound is not new. There are many such devices.
4. The comparison of the student’s sound with the ideal sound and the feedback is unique.

IPD Recycling Cell Phone Cameras Home surveillance systems, property security cameras, nanny-cams, baby and elder monitoring have all become commonplace needs and there are multiple products and services available in the marketplace to fulfill these needs. Many providers offer full service video monitoring but reliable, effective, lower cost solutions may not be as easy to find.

This project will focus on designing a low-cost, motion-activated, solar-powered, security device featuring a digital camera combined with a spotlight. The innovative approach is to recycle cell phones equipped with cameras and integrate them into this new product. The new device could be designed to send the photo to another cell phone or a computer. A small solar panel would charge the cell phone and the battery for the light.

While this idea is very early stage and many issues will need to be fully investigated, a major focus will be on the wide range of digital image quality and whether the variances in quality and age of the recycled cell phones can be effectively employed. The idea is to use off-the-shelf technology integrated into a new, low cost solution. Assembly issues will be important to the business plan but one possibility might include the assembly being done at a facility staffed by disabled people