Entrepreneurial Leadership Academy
Fellows and Project Areas
2011-2012

Jessica Huber, jhuber@purdue.edu - Scholar
Department of Speech Language and Hearing Sciences, Associate Professor – Scholar
I am interested in developing technologies to improve quality of life for individuals with Parkinson’s disease (PD). In particular, I am interested in developing methods to improve communication and reduce falls. As a participant in the Entrepreneurial Leadership Academy, I plan to continue to develop a wearable device aimed at improving communication in individuals with PD. I also plan to continue to develop a software-based treatment for cognitive and balance changes associated with PD. Finally, I would like to begin to form a strong interdisciplinary research group which could eventually lead to a center grant in the study of behavioral treatment of PD.

Omid Nohadani, nohadani@purdue.edu - Scholar
Industrial Engineering, Assistant Professor
Optimization in its broad definition and robust optimization in engineering problems in particular is the research area of my interest. In a real-world problem, an optimized solution may perform sub optimally when errors are encountered. In this context, I am working on algorithms for cancer radiation therapy that are immune to unexpected errors. The treatment of a solid tumor is typically divided in three stages, namely imaging and data collection, treatment planning, and delivery. Currently, each stage is treated as a separate optimization problem with its own constraints. My goal is develop a novel systems approach that takes a holistic angle and connects all three stages to each other and regard the therapy as one system.

Josh Alexander, alexan14@purdue.edu
Department of Speech Language and Hearing Sciences, Assistant Professor
Individuals with severe to profound mid- to high-frequency hearing loss have limited audibility for important speech information. Consequent the knowledge I learned during my participation in ELA, I am in the process of obtaining a provisional patent on a digital signal processing algorithm that I developed that re-codes inaudible high-frequency information in lower frequency regions where hearing loss is less severe. My technique was explicitly designed with this population in mind and preliminary data collected on normal-hearing listeners has demonstrated its superiority over other processing techniques. The first goal of my ELA project is to demonstrate the effectiveness of the algorithm against multiple controls using hearing-impaired listeners and to investigate the usefulness of the algorithm for a larger population of individuals with less severe hearing loss. The second goal of my ELA project is to find ways to introduce my findings to interested partners in industry.

Ji-Xin Cheng, jcheng@purdue.edu
Biomedical Engineering, Associate Professor and Chemistry, Associate Professor
Ji-Xin Cheng has commercialization interest in two projects. The first one is development of multifunctional micelles for repair of injured neuronal tissues in spinal
Cord injury, brain injury, post surgery, and stroke. This project is currently funded by State of Indiana spinal cord and brain injury program and also funded by the Coulter Foundation, through collaboration with Xiao-Ming Xu in IUSM. The second one is development of intravascular vibrational photoacoustic endoscopy for detection of vulnerable plaques, through collaboration with Michael Sturek in IUSM.

Okan Ersoy, ersoy@purdue.edu
Electrical and Computer Engineering, Professor
Infrastructure for Early Detection, Monitoring, and Decision Making in Environmental Disasters by Remote Sensing, Machine Learning and Signal Processing
High resolution mapping of land and/or ocean features, and classification of features by their spectral and spatial signatures are beneficial for early detection, monitoring, mitigation, and decision making in a wide range of environmental disasters and health epidemics. These include geomorphic studies, pollution detection and classification, algal bloom monitoring in seaways, earthquakes, land degradation, biodiversity depletion, atmospheric and air pollution, water quality contamination, droughts, tornadoes, hurricanes, algal blooms, volcanoes, urban pollution and congestion, forest fires, soil erosion, global warming, ecological changes, and an array of biogenic and anthropogenic disasters. Early detection, warning and monitoring (EDWM) systems for natural and man-made hazards have especially become of crucial significance to help protect the environment and our well-being.

The major goals of our project will be to generate an infrastructure to combine algorithmic work with software, data-intensive fast computing resources, and embedding them in a specially designed fast computing system, networked with major remote sensing systems initially at Purdue and later globally to address major issues in remote sensing/decision making research and development for EDWM systems.

Our expertise is in statistical signal/image processing, machine learning and pattern recognition algorithms for remote sensing, especially with multispectral and hyperspectral images, fast computing and software development for data intensive applications. With this background, we will target establishment of national and international collaborations both academically and through company contacts.

Kevin Hannon, hannonk@purdue.edu
Basic Medical Sciences, Associate Professor
I have created interactive, self-guiding web, Iphone and Ipad-based self-examining applications. I am currently putting these in front of students and getting feedback. I am interested in commercializing these apps.

William Hutzel, hutzelw@purdue.edu
Mechanical Engineering Technology, Professor
Professor Hutzel is working on a number of projects with commercialization potential in the area of high performance buildings. One technology is a patented cold climate heat pump that is being demonstrated for the Department of Defense. Another topic is a biowall, which is a living plant wall that is integrated into the HVAC system for a building. A prototype version of the biowall was featured in Purdue’s entry for the 2011 Solar Decathlon, an international competition where teams of university students designed, built, and demonstrated a solar-powered home. Purdue’s INhome (short for
INdiana home) earned a 2nd place finish in this prestigious competition (www.purdue.edu/inhome).

Qing Jiang, qjiang@purdue.edu
Foods and Nutrition, Associate Professor
I am interested in commercialization of the use of new vitamin E metabolites as anti-inflammatory and anticancer agents. Our recent studies have shown that long-chain carboxychromanols, which are novel metabolites from different vitamin E forms, have unique anti-inflammatory and anticancer activities by inhibition of multiple key proinflammatory pathways. We are in the process of testing these effects in relevant animal models. These projects are currently funded by an R21 and R01 grant from National Institute of Health.

Suresh Mittal, mittal@purdue.edu
School of Veterinary Medicine, Comparative Pathobiology, Professor
Professor Suresh Mittal’s research programs are in the area of vaccines against infectious diseases, cancer gene therapy, Modulation of innate immunity, and cancer prevention. Recently he has started working on a novel dietary supplement, which seems to have properties that are important in cancer prevention. He is keen to conduct studies to evaluate the potential of this novel dietary supplement in cancer prevention. If the outcomes are as expected, we will work towards commercialization of this technology.

Corey Neu, cpneu@purdue.edu
Biomedical Engineering, Assistant Professor
Magnetic Prototyping in 3D (MAP3D): Our group uses magnetic fields to align collagen fibers for tissue engineering applications. We use a novel process, termed MAP3D, to create collagen-based scaffolding with ultrastructural organization that resemble native tissues.

Andy Tao, taow@purdue.edu
Biochemistry, Associate Professor
I am interested in commercialization of a platform technology developed primarily in my research lab that has led to two initial products for the analysis of protein phosphorylation that relates to many human diseases. In particular, I am interested in understanding the progress, including putting together a good business plan, fundraise, market analysis and financial strategy.

Steve Wereley, wereley@purdue.edu
Mechanical Engineering, Associate Professor
I have two potential ELA projects that I'm considering. The first is derived from my current small business, a business designing and making programmable Lab-on-Chip devices. This started as a previous Burton Morgan business plan competition winner and grew into its own small business—with a couple SBIRs helping to get things going. The second idea derives from my work with the oil spill in the summer of 2010. I came
up with a way to estimate the size of an oil spill based on images of the flowing oil. I have some ideas for products to commercialize related to that process.

PREPP Fellows

Jeffrey Ackerman, ackermaj@purdue.edu
PREPP Doctoral Fellow
The goal of this project is to develop an elastically-suspended load suspension for legged robots. The Department of Defense, including DARPA and its contractors, is very interested in using robots to assist soldiers on the battlefield and to augment their capabilities. Elastically-suspended loads have the potential to significantly reduce the energetic cost of locomotion, increasing a robots' operating time, speed, or load carrying capacity. More generally, elastically-suspended loads have the potential to increase the energy efficiency of locomotion for humans, animals, robots, exoskeletons, and vehicles. I have developed designs to utilize this technology in multiple robots, a vehicle suspension, an exoskeleton battery suspension, a load-carrying satchel, and a novel baby carrier.

Jonathan Beever, beeverj@purdue.edu
PREPP Doctoral Fellow
Ethics-education, widely construed as both RCR (responsible conduct of research) and moral reasoning, has been mandated at the levels of both institutions and national funding agencies. But while RCR has been institutionalized at Purdue and other institutions, the latter has not; yet, it is perhaps even more central to the working life of the researcher. The Purdue Lectures in Ethics, Policy, and Science is a proven and successful method of bioethical education, discussion, and collaboration created to engage and educate scientists, ethicists, and policy-makers. The Lectures include a robust seminar series, interdisciplinary collaborations, and a host of targeted online resources related to topics in bioethics. My project has been to develop a plan to modularize the Lectures for implementation by other institutions and development into a larger hub network of resources related to specifically to bioethics education.

Anton Iliuk, ailiuk@purdue.edu
PREPP Post-doctoral Fellow
During my time as a Ph.D. student in Dr. Andy Tao’s lab (current ELA Fellow), we have developed a number of novel technologies that are designed to fulfill the currently unmet customer needs in the research field of phosphorylation analysis. To better address this demand, Dr. Tao and I have recently formed a start-up company (within Purdue Research Park) named Tymora Analytical to realize our inventions into deliverable products. My objective in the program is the commercialization of Tymora’s two proprietary technologies: PolyMAC for mass spectrometry-based phosphorylation analysis, and pIMAGO for ELISA- and Western Blotting-based phosphorylation analysis. More specifically, I hope the program will assist me with the better understanding of the commercialization process, definition of our target market, formulation of licensing agreements, fundraising, as well as sales and marketing strategies.
Bum Chul Kwon, kwonb@purdue.edu
PREPP Doctoral Fellow
Goal of project: The goal of my PREPP project is to deliver a head-tracking-based content stabilization technique called ReadingMate to treadmill users at the gym. ReadingMate can track one’s head movements and stabilize the position of contents on a computer screen. Using the system, a user can read a book while running on a treadmill. My PREPP project is particularly interested in finding out an appropriate business model for ReadingMate.
Current focus of work: My current focus of work is to evaluate the system with potential users.