The Battelle Engineering, Technology and Human Affairs (BETHA) Endowment
Previously Funded Projects

2014-2015

The Columbus Sound Track Project: Engaging Citizen Scientists to Map Noise Levels in Columbus OH
Lawrence Feth (Speech and Hearing Science)

Noise can deleteriously affect learning, quality-of-life, biodiversity and health. This project will use a citizen-scientist approach to create a noise-map of the Columbus metropolitan area. Members of the public with smartphones will be able to download a free app to measure noise levels tagged with GPS coordinates. COSI will host an interactive display allowing users to explore noise levels in different Columbus locations at different times of day. The display will also be available for exploration online. This project will engage the public in the scientific process and raise awareness of possible implications of different levels of noise.

Culturally Relevant Reading Instruction for Urban Learners Using Voice Activated Computer Assisted Instruction (CAI)
Ralph Gardner III (Educational Studies)

Reading is an essential skill for school success. Poor reading skills place children at risk for school failure and substantially impair long-term possibilities for social mobility and economic success. Currently, the state of Ohio mandates retention of all third grade students who fail the state reading tests. This research combines innovative computer assisted instruction (CAI) using voice recognition software and culturally relevant reading materials to improve the reading fluency and comprehension of first and second grade urban learners at risk for reading failure. The project is designed to demonstrate the effectiveness and applicability of this CAI intervention in urban schools.

Toy Adaptation Program: A Plan for Continuation and Growth
Rachel Kajfez (Civil, Environmental and Geodetic Engineering and Engineering Education Innovation Center)

Many engineering students struggle to connect engineering and societal impact. The Toy Adaptation Program (TAP) meets this need by providing hands-on engineering experiences (workshops, labs, and community service sessions) that allow students to apply their technical knowledge while adapting electronic toys for children with disabilities. While the experiences for students allow them to connect concepts related to circuits, soldering and reverse engineering to societal impact, the experiences themselves result in adapted toys that can be donated to toy libraries and families in need. These outcomes allow this program to not only benefit engineering students but also the community.

Mediated Spaces and Human Experience: Using Locative Technology to Enhance Presence and Place
Maria Palazzi (Advanced Computing Center for the Arts and Department of Design)
The One Ohio State Framework initiative recommends connecting ideas and information throughout the university. Enhancing connections between spaces and inhabitants supports this goal. Digital media and mobile devices augment our relationship to our environments with otherwise invisible evidence of history and culture. Seeding spaces with beacon technology will embed new layers of mediated information in Sullivant Hall to be delivered at contextually relevant locations, thereby exploring how locative technology as a form of presence design can best connect people with history, local culture and the university.

2013-2014

Engineering, Technology, Human Affairs, and Social Justice: From Columbus to Colombia
Kevin M. Passino (Electrical and Computer Engineering)

Engineering can improve “human affairs” by promoting social justice via new technologies tailored to the needs of disadvantaged communities, and education to build technological capacity. This project is focused on: (i) cross-cultural K-12 STEM Outreach in Columbus and Colombia; (ii) technology development for people who are poor or homeless in Columbus; and (iii) technology development for engineering laboratories in disadvantaged universities in Colombia. Results will be used in a course and book on humanitarian engineering.

Harnessing Education and Technology for Environmental Detection (HEATED)
Bryan G. Mark (Geography and Byrd Polar Research Center)

A Maymester course where a diverse group of students design and build a device to collect geo- and time-tagged temperature data when deployed on moving vehicles, and to create a database, to store and assimilate data collected by the device. This project will result in a device prototype; an innovative, replicable course; data to better understand urban heat islands; and a multidisciplinary team prepared to continue research through other funding opportunities.

ITS STEM
Joan M. Herbers (Evolution, Ecology and Organismal Biology)

An Institute for The Study of Science, Technology, Engineering, and Mathematics (ITS-STEM) to serve as an intellectual hub for scholars who study the social, ethical, legal and educational challenges presented by science and technology. ITS-STEM will provide a forum for faculty to explore how the cultures of science and technology affect their work. Activities include a colloquium series, an outreach program and acquisition of external funding.

Student-developed Sustainable Housing Solutions in Central America
Howard L. Greene (Engineering)

Senior capstone students in multiple disciplines engage with university partners and residents in Honduras to develop and deploy a sustainable, replicable housing solution for the rural poor. Activities encompass conducting focus groups, developing concepts, designing and building prototypes, business plan development and building a pilot Honduran residence. The experience provides a transformational Educational opportunity that fosters interdisciplinary collaboration while allowing students to comprehend firsthand the global context of the solutions they develop.
2012-2013

**Big Data and the Social Future**  
*Peter M. Shane (Law)*

A multidisciplinary conference on the potential for new enterprises grounded on "big data" to improve economic, social, and political life. The program would publicize the potential of "big data" enterprises in Columbus, and raise awareness of key law and policy issues. Potential topics include big data as an economic driver, challenges to privacy and information security, big data infrastructure requirements, and big data as it relates to government accountability, health care, and the urban future.

**The End and the Beginning of Everything**  
*Shane Mecklenburger (Art)*

*The End and the Beginning of Everything* is a collaborative art-science initiative between the OSU Departments of Art and Astronomy, the University of Chicago Department of Astrophysics, Chicago's Adler Planetarium and the Advanced Computing Center for the Arts and Design (ACCAD). Accelerating technologies are amplifying astronomers’ ability to model and observe, expanding our understanding of life and the universe. This initiative guides young artists in creatively interpreting astronomical research for a public contemporary art exhibition.

**Narrowing Technology Gaps between Ohio State and Eastern Africa Using Mobile Electronic Data Capture and Analysis System for Zoonotic Diseases Research and Training**  
*Wondwosen Gebreyes (Veterinary Preventive Medicine)*

This project aims to provide opportunities for OSU students and faculty members to conduct a research outreach using *Mobile Electronic Data Capture and Analysis System* for monitoring foodborne pathogens in Eastern Africa. The proposed study aims to 1) narrow the technology gap and to facilitate scientific networking between OSU and eastern Africa partners; 2) enhance interactions among producers, scientists and policymakers; and 3) improve the livelihood of poor urban and peri-urban livestock producers in minimizing zoonosis.

**Understanding Asia through Religion and Art: Creating Finding Aids and Search Tools for a Database of Original Source Materials**  
*Patricia Sieber (East Asian Languages and Literatures)*

Understanding Asia, particularly through its religions and belief systems, is an imperative in today's global environment. This project will create "finding aids" for the online database of approximately 262,000 photographs in OSU's Huntington Photographic Archive of Buddhist and Asian art. Currently aimed at scholars with advanced knowledge, the Archive can vastly extend its reach to multidisciplinary and multi-level audiences through enhanced search capabilities, fostering education about Asia, and creating a template for other databases.
2011-2012

Communicating Health Sciences: Emerging Challenges and Opportunities for Public Engagement  
*John Barnard (Pediatrics)*

The promise of modern health science will be realized only if it is understood and adopted by an appropriately informed public. The media is a key factor in creating understanding. We propose two public colloquia, one on personal genomics and the other, nanomedicine, involving health care scientists, science communication experts and journalists. The result will be a unique discourse leading to greater understanding and better communication strategies in these two important emerging areas of health care.

SistaAction: Black Girls Creating Digital Futures  
*Elaine Richardson (Teaching and Learning)*

The SistaAction project proposes to enhance the critical media literacy skills of urban Black middle school girls in an afterschool mentoring setting, by providing them with access to digital and internet technology tools and assistance in the creation of self-authored counter narrative media productions that support wider representation of empowering images of young women. While work is local, this work addresses a national and global problem through which girls of color experience socialization into oppressive race and gender roles through mainstream mass mediated popular culture.

Re-visioning Light in Our Lives: A Holistic and Sustainable Approach  
*Mary Tarantino (Theatre)*

The study of light is often compartmentalized, isolated into physics, installation art, theatrical/entertainment, engineering, and sustainability. *Re-visioning Light in Our Lives* brings together individuals from Architecture, Engineering, Theatre, ACCAD, and outside project partners and consultants to examine lighting as it informs human needs, energy efficiency, and structures. Student teams will engage the community in outreach research inquiries and construct site-specific installations, testing contemporary lighting applications with an emphasis on lighting function and quality.

Seeds of Learning: Creating a Language Sciences Pod at COSI  
*Laura Wagner (Psychology)*

This project will create a research "pod" at the Columbus Center for Science and Industry (COSI) dedicated to the study of language. Ohio State faculty will conduct state of the art research studies inside the pod using museum visitors as research participants. Trained Ohio State students will provide educational explanations to adult and child visitors, promoting understanding of language sciences and the scientific process more generally.

2010-2011

E3 Lab: Sustainable Development Solutions for Energy, Economy and Equity in Africa  
*Charisma Acey (Architecture)*

The proposal establishes E3 Lab, a local energy solutions incubator for household alternative energy technologies in sub-Saharan Africa. The Ghana Sustainable Change program would examine biodigesters, a low-cost method of renewable energy production from the anaerobic digestion of organic waste. Using geographic information systems (GIS) students and community leaders would prioritize locations for siting biodigesters, as well as tracking adoption and diffusion. The E3 internet portal will enable ongoing communications between community members and study abroad participants.
Dance Fort: An Interactive Archive of Choreographic Process  
Bebe Miller (Dance)

For decades, the traditional method of an artist's choreographic legacy has been in the documentation of the finished work: videotapes of performance, photographs, etc. With Dance Fort we seek to create opportunities for artists and scholars to inscribe history in a living way and, using existing and emerging technologies, create archives that are dynamic and equally useful to the current and next generation, shifting the paradigm of an artist's archive from artifact to artwork.

Exploration of the Geometry and Cosmology of the Newark Octagon Earthworks  
Alan Price (Design, Advanced Computing Center for the Arts and Design)

This project is for the design of an interactive computer application for analysis and understanding of the geometric relationships of Ohio's Newark Octagon Earthworks to observations of the Moon and Sun. The simulation model will be used for research and to educate the public about these ancient sites in Ohio, and how scientific thinking and observation played an important role in the culture of ancestral Native America.

Reaching for the Moon: Technology for At-Risk Preschool Children  
Kathy Cabe Trundle (Teaching and Learning)

This project assesses the efficacy of using software to develop young children's computer skills and understanding of targeted science and mathematics concepts. Preschool teachers will be provided with professional development opportunities to develop their understandings of concepts and technology skills. The outcomes are increased teacher preparation and school and technology readiness for young children. This readiness is especially important for at-risk learners; without it they fall behind upon kindergarten entry, especially in STEM pathways.

2009-2010

Development of Globally Competent and Socially Engaged Engineers: International Collaborative Design Project for Aerial Detection of Landmines  
James W. Gregory (Mechanical and Aerospace Engineering)

The proposed project is a student-designed and constructed remote-control air vehicle for rapid, aerial detection of landmines. This project will develop technology that directly benefits society, and serve as a context for the development of future leaders in engineering who possess an integrated worldview of technical excellence, service, and global citizenship. A broad impact will result from citizens and students of eastern and western societies discussing the interface between technology and society via videoconference.
Reading the Code: Genetic Literacy Across the Middle School Curriculum
Richard J. Voithofer (Educational Policy and Leadership)

This project addresses the emerging need for genetic literacy. Through the creation of a problem-based learning computer simulation, this project will provide a learning technology for middle school students that crosses mathematics, science, and social studies. The ultimate outcome of this project is to help the leaders, STEM workers, and citizens of tomorrow to begin to understand the positive and negative impact of the growing body of genetic knowledge and increasing capacity for genetic manipulation.

Service Learning and Technology Transfer in Veterinary Public Health and Biotechnology: OSU-VPH-Biotech Eastern Africa
Wondwossen A. Gebreyes (Veterinary Preventive Medicine)

More than two-thirds of emerging infectious diseases are zoonotic. OSU initiated a consortium in Eastern Africa where zoonotic diseases cause significant burden but technological capacity is lacking. While OSU has successful programs in infectious diseases, students are lacking global perspectives and first-hand exposure. Using the “One Health, One Medicine” approach, we propose to conduct service learning activities to enhance OSU students’ practical knowledge while contributing to control of zoonotic diseases and build biotechnology capacity.

Shifting Centers: Creative Collaboration in and outside of Africa through Cyberlearning and Ubiquitous Technologies
Esther Marian Baker-Tarpaga (Dance)

African and American contemporary choreographers use cyber technology and web-based communities as a space for artistic exchange and innovation. This proposal seeks funding for the development of an online performance symposium. Funds will be used to support research meetings with key collaborators, internationally recognized, award winning artists in Senegal, South Africa, Morocco, and Kenya. The symposium content will be determined by the research and creative work of the artists and students collaborating and contributing to the project.

2008-2009

Antibiotic Resistance Transmission through the Global Food Chain: Public Health Impact and Intervention Strategies
Hua Wang (Food Science and Technology; Microbiology)

The rapid emergence of antibiotic resistant (ART) bacteria is becoming a major public health threat. Our studies found that ART non-pathogenic and “beneficial” bacteria were highly prevalent in conventional food products, and the food chain has become a significant community-based avenue transmitting ART to humans. We seek Battelle support for education/extension activities (international conference, food safety video, publications) to reveal the global health impact of ART bacteria and explore strategic breakthroughs to control the problem.

Enhancing Interest in Science and Technology by Engaging High School and Undergraduate Students in Real-Time Research Projects
Parwinder S. Grewal (Entomology)

Ensuring the vitality of the nation’s scientific and technological enterprise requires that we tap the talents of all citizens. The goal of this summer program is to enhance student interest in science, technology, engineering and mathematics (STEM disciplines) by immersing them in ongoing, OARDC research projects. By opening the doors to underrepresented high school and undergraduate students from rural areas, the program will influence future leaders and effectively engage OSU in the community.
“Every Reader, Every Writer Has a Story” focuses on the importance of preserving literacy stories, especially for groups whose literacy history has been ignored. These presentations and workshops acquaint audiences with the Digital Archives of Literacy Narratives (DALN), the first public, online repository to preserve personal accounts of how individual citizens, families, and communities learn to read and write, how literacy shapes their lives. The DALN supports historical, educational, and community research on literacy.

Influence of Culture, Society, and Religion on the Practice of Veterinary Medicine in Thailand: The Anatomy, Habitat, Health, and Behavior of Asian Elephants

Nongnuch Inpanbutr (Veterinary Biosciences)

The proposed project is to develop an audiovisual program revealing how culture, social, and religion influence the practice of veterinary medicine in other countries such as Thailand. This educational program also includes anatomy, habitat, health and behavior of Asian elephants. This program will increase cultural sensitivity and enhance awareness of cultural diversity for students and elevate the quality of education on Asian elephants. This will promote International Studies at OSU, nationally, and globally.

The Virtual Pasture

Michael J. Mercil (Art)

The Virtual Pasture is a project for the Department of Art with the College of Food, Agricultural and Environmental Sciences and the Wexner Center for the Arts. Beginning in spring 2009, The Virtual Pasture reanimates the central campus landscape with a small flock of sheep grazing off-site, but streaming through images transmitted live to a video monitor installed outside the Wexner Center to face the Oval. The project includes working with OSU Extension’s 4-H Youth Program to produce a documentary video. Through these and related activities, The Virtual Pasture creates a visible public forum for a variety of issues regarding the local production, marketing and distribution of food in an increasingly industrialized, mechanized and technology-centered agricultural economy.