

School of Emerging Technologies
Call for Proposals for Seed Funding

Introduction

Technology is changing how we look at the world. All areas have been affected- science, liberal arts, humanities, the health professions, communications, business and the fine arts have all experienced significant technology induced change. These changes are blurring and erasing traditional disciplinary boundaries and creating new interdisciplinary areas of studies. Work in these emerging areas requires interdisciplinary teams that bring very different skill sets to the same problem. However, interdisciplinary collaboration is filled with difficulties, especially in its early stages. Finding the right people and the right external support structure is often much harder when one moves outside of the traditional disciplinary boundaries. To that end, the SET will support teams of interdisciplinary faculty in the early phases of collaborative projects. Two kinds of projects are of particular interest:

- Projects that foster the development of new innovative, interdisciplinary courses and degree and non-degree programs in fields involving emerging technologies. These projects could address the anticipated technical workforce needs of the region and/or integrate the study of social/cultural, environmental and ethical issues as well as specific technologies.
- Projects that facilitate interdisciplinary research and creative collaborations that focus on the study and application of emerging technologies in addressing public and individual needs, including quality-of-life enhancements.

The purpose of this funding is to support faculty at the very first stages of a collaborative effort and/or faculty with nascent collaborations that are ready to grow into a larger effort. The seed money is meant to enable these collaborations to blossom into larger, self-sustaining projects capable of competing for external support.

Projects should be in the area of emerging technologies. We take an expansive view of emerging technologies, and the Appendix contains both a list of previously funded projects as well as an illustrative list of promising project areas.

Projects should cross traditional disciplinary boundaries, and should be collaborative. These collaborations can take the form of faculty teams from different colleges or departments within Towson, or can take the form of Towson faculty collaborating with experts from government or corporations.

Project proposals that are integrated into degree programs and/or courses at Towson University are encouraged.

The SET may be able to assist faculty by identifying potential external or internal collaborators; be sure to contact the SET well before any due dates.

The Office of Academic Innovation and CIAT Lab are able to provide assistance to faculty designing new curriculum and instructional and assessment approaches. They are especially interested in projects that have the potential to create new or to improve current majors, minors, tracks, and/or concentrations.

Timeline

Projects will be supported for up to two academic years, starting no earlier than July 1, 2019 and ending no later than June 30, 2021.

Important Dates:

January 23, 2019: SET Seed Funding Panel
March 1, 2019: Deadline for proposal submissions
May 1, 2019: Expected notification of funding decisions
July 1, 2019: Expected project start date
June 30, 2021: Latest project completion date.

SET Seed Funding Panel

Date: 12:00 to 2pm, January 23, 2019

Location: YR459, Computer and Information Sciences Department Conference room

School of Emerging Technologies invites faculty who are interested in applying for or who have received SET seed funding to attend the SET Seed Funding Panel on January 23, 2019. The panel will provide a supportive setting for faculty who are interested in applying for SET seed funding to communicate and learn from faculty who have successfully implemented SET supported projects.

Lunch will be served at 12:00 followed by panel discussions. Please save the date and RSVP to Andrea Chenowith (achenowith@towson.edu) by January 16, 2019 if you plan to attend.

Budget

Funds can be used to provide start-up funds for equipment or supplies, or to provide support for undergraduate or graduate research assistants for the summer, the academic year, or both. Funds can be used to support travel by undergraduate students, graduate students, and faculty, however such travel must be directly related to the project. Funds can be used to support faculty summer salary, but no more than \$7,000 can be spent on any individual faculty member's summer support with no more than \$3,500 available in any single summer.

Funding requests can be made in any amount, however projects will only be funded if sufficient funds are available; larger funding requests will need to provide a more compelling justification for funding than smaller requests.

The university's budget for 2018-20 has not been completely determined and the amount of money available to support these projects will be determined by the university's budgetary approval process.

If your project is selected for seed funding, the SET Program Coordinator, Andrea Chenowith, will be your point of contact for disbursement of your awarded funds for all project costs, including but not limited to faculty payment, equipment and supply purchases, and student employee hiring,

Required Proposal Elements

1. Cover sheet
 - a. Includes project title, signatures of each faculty member, together with their chairperson(s) and dean(s).
2. Project Narrative
 - a. No more than five pages, single spaced 12 point font with 1" margins.
 - b. It should clearly describe the proposed research project, its significance, and its relationship to emerging technologies.
 - c. It should explain the roles of the different members of the project team.

- d. It should clearly explain how the project will continue beyond the initially supported period, including a plan describing how the project will become self-supported through external funding.
3. List of References
 - a. All proposals must be supported by references to appropriate peer reviewed literature.
4. Budget and Budget Narrative
 - a. This should describe how the funds will be used and provide appropriate justification. If equipment or supplies are to be purchased, then the narrative should provide an itemized list.
 - b. If the project is receiving funding from another source, or if the proposers are applying for funding from another source, then the proposal should provide complete details. This should include the total project budget, the component to be provided by the SET, and a justification why the contribution from SET is essential to the project's success.
5. Curriculum Vitae for each faculty member or external principal on the project. Faculty should include their history of external grant proposals.
6. Potential Reviewers
 - a. Proposers should provide names and contact information for three (or more) potential external reviewers for their proposal. These can be faculty or industry experts, and should be free of potential conflicts of interest. Proposed reviewers cannot have collaborated with the personnel on the proposed project within the past three years on a paper or a grant proposal. Proposed reviewers cannot have served as an advisor or a student of any of the personnel on the proposal.

Review Process

The SET Director and the SET Faculty Advisory Committee will select two anonymous reviewers for each proposal. These reviewers will be content experts in the area of the proposal. The reviewers may be faculty from Towson, faculty from other institutions, or experts from industry or government. Reviewers will be free from potential conflicts of interest. No one will be selected as a reviewer who has collaborated with the personnel on the proposed project within the past three years on a paper or a grant proposal. Reviewers will not have served as an advisor or a student of any of the personnel on the proposal.

Reviewers will be asked to evaluate the proposal on each of the following criteria:

- Are the proposed activities interdisciplinary and related to emerging technologies?
- What is the intellectual merit of the proposed activities?
- What is the broader impact of the proposed activities?
- Is the budget appropriate for the project and does it make the best use of available resources?
- What is the potential for the proposed activities to become self-supported through external funding?

The intellectual merit of proposals designed to improve teaching includes awareness of the relevant research literature.

The broader impact of the proposal includes the impact of the project on underrepresented populations, both students and faculty.

After reviewing the reports of the reviewers, and guidance from the SET Faculty Steering Committee, the SET Director will make the final funding decisions.

Submitting the Proposal

Proposals should be submitted to Andrea Chenowith (achenowith@towson.edu) in the School of Emerging Technologies prior to the deadline. Electronic submissions are preferred for all documents, save for the signed cover sheet.

The Reporting Process

Awardees will submit short interim reports on the results of their project by January 15, 2020, June 15, 2020, and January 15, 2021. Awardees will submit a final report on the results of their project no later than September 15, 2021. These reports may be made public. Reports should be submitted electronically to both Jinjuan Feng (jfeng@towson.edu) and Andrea Chenowith (achenowith@towson.edu).

Questions

Proposers are encouraged to discuss their ideas with the Director of the School of Emerging Technologies, Jinjuan Heidi Feng (jfeng@towson.edu, x43463).

Appendix: Examples of Previously Funded Projects

- *Voice Writing Center for Radio Captioning*, Elyn Sheffield (Psychology), 2012-2014.
- *Clinical Teacher Preparation for 21st Centuries Literacies*, Barbara Laster (Educational Technology & Literacy), 2013.
- *Permanent Outdoor Kinetic Light Instruments*, Jenn Figg (Art), 2013-2014.
- *Pesticides in Kenya: Field Mapping and Laboratory Studies*, Clare Muhoro (Chemistry), Jeremy Monn (CGIS), 2013.
- *Developing an Effective and Safe Odorant-Baited Trap to Control for House Crickets*, Vonnie Shields (Biology), 2013-2014.
- Mapping the distribution of *Oplismenus hirtellus* subsp. *undulatifolius* (wavyleaf basketgrass) a recent invader in Maryland forests: A citizen-science initiative, Vanessa Beauchamp (Biology), Sidd Kaza (Computer Science), Josh Dehlinger (Computer Science), 2013-2015.
- Using large datasets to quantify and visualize the movement rate of road salt pollution from impervious surfaces to streams, Joel Moore (PAGS), Mike McGuire (Computer Science), 2013-2015.
- Validation of Head Impact Sensors and Real Time Head Impact Kinematics in Sport, Michael Higgins (Kinesiology), 2014-2015.
- Big Data Mining and Modeling to Develop Effective Strategies for Consumer Co-Design Online Social Networks Initiatives, Phillippe Duverger (Marketing), Nam Nguyen (COSC), 2014-2016.
- Perovskite Metal Oxides for Green Energy Applications, Rajeswari Kolagani (PAGS), Grace Yong (PAGS) 2014-2015.
- Effects of Climate on Human Capital Development in Peruvian Children: A Geospatial Investigation, James Manley (Economics), Paporn Thebpanya (Geography), 2014-2016.
- ArmStrokes: Mobile phone-based rehabilitation games and support system for stroke survivors, Katherine Ziying Tang (COSC), Sonia Lawson (Occupational Therapy and Occupational Science), Jinjuan Heidi Feng (COSC), 2014-2016.
- The development of an interdisciplinary bridge course in Healthcare Systems Design and Implementation, Niya Werts (Health Science), Subrata Acharya (COSC). 2015-2016.
- The Guitar Like Object: A Computer Extended Performance Instrument, Thomas Ciufu (Music), 2015-2016.

- “Moving” Sleep to the Forefront of Exercise Science, Devon Dobrosielski (KINES), Tamara Douglas-Burton (Interprofessional Health Studies), 2015-2016.
- Geospatial Investigation of Community Navigation and Well-being for Older Adults, Kendra Heatwole Shank (OCTH), Virginia Thompson (GEOG), 2015-2017.
- Improving health aging through assessment of energy expenditure and physical activity with a mobile metabolic system, Nicolas Knuth (KINES). 2016-2017.
- Investigating the Reading Process Using EMMA, Christina Pelatti (SPPA), Maria Liwanag, Prisca Martens (Elementary education), & Ray Martens (Art), 2016-2018.
- Enhanced Optical Trapping and Imaging Using Gold Nanostructures for Catalysis: An Interdisciplinary Approach, Mary Devadas (Chemistry) Jia-An Yan (Physics), 2016-2018.
- Fostering Awareness and Resiliency on Topics of Mental Health and Wellbeing in College Students: A Joint Initiative between Academic Affairs and Student Affairs, Karen Eskow (Family studies and community development), Leigh Carter (Counseling Center), Donna Cox (Health Science), Lisa Beasley (Family studies and community development), Jonathan Mattanah (Psychology), Lilian Odera (Counseling center), Karen Oppenheimer (Disability Support Services), 2017-2019.
- Designing and Implementing a Connected Learning MOOC to Support Writing Teachers' Professional Learning, Sarah Lohnes Watulak (Educational technology and Literacy), Vicki McQuitty (Elementary education), 2017-2019.
- Bifunctional Catalysts for Hydrogen Release from a Storage Material with Promise for the Transportation Sector, Tim Brunker (Chemistry), Thomas Rhoades (Economics), Shuhua Ma (Chemistry), 2017-2019.
- Developing an AR and mobile game based mathematical learning approach for 8th grade students, Chris Cornwell (Math), Lin Deng (Computer and Information Sciences), Jing Tian (Math), Victoria Phillips (Math), 2018-2020.
- Optimizing pediatric emergency department care for patients with an ASD and their families, Jennifer Kouo (Special Education), Ziyang Tang (Computer and Information Sciences), 2018-2020.
- The Association Between Lower Extremity Biomechanics and Injury in Collegiate Athletes: A Markerless Motion-Capture System Based Study, Peter Lisman (Kinesiology), Nathan Wilder (Athletics), 2018-2020.
- Expert Elementary teachers' small group discussion strategies in post-investigation science and post-testing engineering discussions with Avatars, Pamela Lottero-Perdue (Physics, Astronomy, Geoscience), Laila Richman (Special Education), 2018-2020.

Appendix: Emerging Technologies

We take an expansive view of what constitutes an emerging technology. Potential topic areas include

- *Construction Management and Technology*: integrating project management with construction technology, especially newer innovations such as “green” technologies associated with Leadership in Energy and Environmental Design (LEED) certification, and Building Information Management Systems (BIMS).
- *Biotechnology, bioinformatics*: are just two examples of life sciences fields that present opportunities to launch interdisciplinary research programs, which can interface with our Molecular Biology, Biochemistry and Bioinformatics (MB3) academic program.
- *Geo-Spatial Technologies*: refer to technologies used for capturing, storing, retrieving, manipulating, analyzing, and displaying information about features or phenomena that occur on the earth’s surface. These technologies include geographic information systems(GIS), remote

sensing, and global positioning systems (GPS). Geographic information science is the rapidly growing multidisciplinary science behind the development and application of these technologies.

- *Nanotechnology*: deals with the control of matter on the sub-micron scale as well as the fabrication of devices on this same length scale. It is a highly multidisciplinary field, drawing from many disciplines including chemistry, applied physics, and materials science.
- *Health Informatics*: deals with the collection, storage, and use of health care information, including the use of devices that collect and store personal health data (e.g., heart rate, blood pressure) and allow for appropriate usage by medical personnel.
- *Assistive Technologies*: use software and/or hardware to improve accessibility for individuals with perceptual, cognitive, and motor impairments and/or differences.
- *Interactive Living Design*: combines faculty expertise to design living spaces for diverse needs. This could involve architectural design, computer interface, visual design and other factors. Smart living spaces are designed to be livable for individuals who have mobility limitations.
- *Environmental Design*: develops physical environments, both interior and exterior, to meet functional needs focused on humans' interface with their environment. ED ranges from the microcosm of designing small objects for everyday use, to landscape architecture, engineering, industrial design, interior design and fashion design. The essential aim of environmental design is to produce places, products and services in a way that reduces the use of non-renewable resources, minimizes environmental impact, and relates people with the natural environment.
- *Ethics and Human Enhancement Technologies*: is devoted to the study of the social implications of scientific and technological progress and the impact of emerging technologies on individuals and societies. Soon, artificial intelligence, nanotechnology, genetic engineering and cognitive science may allow human beings to transcend the limitations of the human body. Life spans may extend well beyond a century, human senses and cognition may be enhanced, and humans may have greater control over their emotions and memory. Human bodies and brains could be merged with computers. These future scenarios raise many ethical challenges that will require an educated citizenry prepared to confront them.
- *Gaming development*: involves the study of mathematical game theory and artificial intelligence (AI) techniques. In a multiple-agent and competitive environment, one uses heuristics, pruning techniques and AI search algorithms to seek optimal strategies, to describe rational and intelligent behavior, and to make serious decisions in situations as diverse as bankruptcy proceedings, product pricing, national defense, health care and emergency preparedness.
- *RFID technologies*: are increasingly critical to the efficient operation of large, complex enterprises. While the use of radio-frequency identification hardware is already widespread, new and more efficient and effective software applications may be developed for different industries. Furthermore, the adoption of RFID technology is currently limited to high-value items, so research into lowering the unit cost through RFID chip development or software solutions could be revolutionary.

This list should be considered illustrative rather than exhaustive, and we encourage proposals in other emerging technologies areas.

Appendix: Goals of the School of Emerging Technologies

1. Support and enhance existing courses and academic degree programs throughout the university that relate to emerging technologies and their social, environmental and ethical implications.

2. Foster the development of new innovative, interdisciplinary courses and degree and non-degree programs in fields involving emerging technologies – programs that address the anticipated technical workforce needs of the region and integrate the study of social/cultural, environmental and ethical issues as well as specific technologies.
3. Produce college graduates and postgraduates with marketable skills and potential for career growth in technology-driven fields.
4. Stimulate and facilitate interdisciplinary research and creative collaborations that focus on the study and application of emerging technologies in addressing public and individual needs, including quality-of-life enhancements.
5. Collaborate with entities in the region in identifying key technological areas of focus that would benefit from university involvement in designing and developing innovative processes and products.
6. Establish strong partnerships with area community colleges to insure seamless transitions for students desiring a four-year degree that focuses on an area of technology.
7. Establish K-12 outreach initiatives to encourage more students at the pre-college level to pursue technology-based careers.
8. Collaborate with private and governmental partners in the region to address the professional development needs of their current technical workforce.
9. Serve as a catalyst to make technology and issues related to technology integral parts of the undergraduate educational experience spanning both general education and major course offerings.
10. Promote understanding among all Towson students of the ethical implications of current and future technologies and identify and address ethical issues confronting technology professionals.