

BOARD OF REGENTS OF THE UNIVERSITY OF WISCONSIN SYSTEM

**Research, Economic Development, &
Innovation Committee**

Webex Videoconference

Thursday, April 8, 2021

10:30 a.m. – 11:45 a.m.

- A. Call of the Roll
- B. Declaration of Conflicts
- C. Approval of the Minutes of the February 4, 2021 Meeting of the Research, Economic Development, and Innovation Committee
- D. UW-Stout: How a Polytechnic Applies 21st Century Technology in the Development of Innovative Solutions to Support Wisconsin Workforce and Economic Growth
- E. 2021 UW System Regent Scholar Grants

April 8, 2021

**UW-STOUT: HOW A POLYTECHNIC APPLIES 21ST CENTURY
TECHNOLOGY IN THE DEVELOPMENT OF INNOVATIVE SOLUTIONS
TO SUPPORT WISCONSIN'S WORKFORCE AND ECONOMIC GROWTH**

REQUESTED ACTION

Information only.

SUMMARY

The University of Wisconsin-Stout is a career-focused, comprehensive polytechnic university with 97.8 percent of its graduates employed on or before graduation or continuing their education. Its students represent a diverse range of backgrounds and interests, and they are encouraged by faculty and staff to integrate scientific theory, applied learning, and research to solve real-world problems and to help grow the economy.

UW-Stout faculty, staff, and students demonstrate how cross-disciplinary collaboration has resulted in students using applied learning to solve immediate problems in an industry setting. The "Buzz Digital Project" is an online simulation that incorporates lean manufacturing principles to shift a project that is typically completed in-person to a virtual format. The development of the simulation provided students with co-op and internship opportunities and valuable industry experience that can be scaled and adapted to a variety of situations. The project also exemplifies the value and importance of critical, intra-institutional, and external partnerships with business and industry that reflect the distinct UW-Stout learning and service experience.

Presenters

- Dr. Katherine P. Frank, Chancellor
- Randy Hulke, Executive Director, UW-Stout Discovery Center
- Ted Theyerl, Senior Management Engineer
- Dr. Andrew Williams, Associate Professor, Game Design and Development
- Steve Datz, Game Design and Development Student – Computer Science
- Simon Meyer, Game Design and Development Student – Fine Arts
- Aram Wahler, Design Graduate Student – Fine Arts

BACKGROUND

The hands-on, “learn by doing” process at UW-Stout begins as early as the freshman year through a series of interactive learning environments. To encourage this approach, the campus has three times as many labs as classrooms. UW-Stout Chancellor Katherine Frank will provide an overview of an innovative, multi-disciplinary project that uses gaming expertise for the design of an online tool designed to help manufacturers understand and apply lean process improvement. This 21st-century approach to developing business solutions reflects the collaborative culture and mindset at UW-Stout.

The [Discovery Center](#) is UW-Stout's primary outreach and engagement organization, focused on working with companies and organizations on process improvement, product development, business growth, professional development, culture development, and applied research initiatives. Among the resources within the Discovery Center is [UW-Stout's Manufacturing Outreach Center](#) (MOC). Since its formation in 1994 within the [National Institute of Standards and Technology Manufacturing Extension Partnership](#) (NIST MEP) network, the MOC has worked alongside Wisconsin's small- and mid-size manufacturers to leverage industry experience, tech-savvy, and teamwork to improve the production process, grow markets, enrich employees and to develop new products. NIST MEP has been measuring the impacts of MOC's efforts with its industry partners from its origins, with MOC clients achieving over \$900 million in increased sales, cost savings, and investments and creating or retaining over 6,000 jobs.

The MOC accesses the resources of UW-Stout to provide innovative solutions to industry challenges. This project presentation demonstrates how these collaborations advance UW-Stout's Polytechnic mission, bolster student learning through applied experiences, link faculty and programs with Wisconsin industries and communities, and provide innovative economic development outcomes.

“Buzz Digital” Project Team:

Randy Hulke is the Director of UW-Stout's Discovery Center and is responsible for leading a collection of multi-disciplinary centers built around UW-Stout's Polytechnic programs that are active in impacts-focused technical assistance and applied research. Among these centers are the Center for Innovation and Development, the DC FabLab, the Leadership Institute, the UW-Stout EDA-University Center, and the Stout Manufacturing Outreach Center (SMOC). Randy earned his MBA at the University of Minnesota.

Project and Cooperative Student Sponsor: Ted Theyerl is a Senior Management Engineer for the UW-Stout Manufacturing Outreach Center (MOC). During his 20 years with the MOC, Ted has worked with hundreds of individuals to introduce and support lean manufacturing techniques and to implement lean and continuous improvement strategies at a broad range of companies throughout Wisconsin. Ted has a BS in Industrial Technology from the University of Wisconsin-Stout.

Faculty Lead and Cooperative Student Advisor: Andrew Williams is Program Director for UW-Stout's Game Design and Development–Art, B.F.A. Entertainment Design, and Associate Professor of Art and Design History. His research interests focus on the intersection of the history of art, design, interactive media, and film. He is the author of the video game history textbook, "History of Digital Games: Developments in Art, Design, and Interaction." Andrew earned his Ph.D. in Cultural and Historical Analysis of Design and his M.S. in History of Interiors and Material Culture, both from UW-Madison.

Cooperative Student Game Design and Developer: Stephan Datz is a student in UW-Stout's Computer Science – Game Design and Development (GDD) program. Steve's interests span both game design and computer programming, learning strong design principles supported by clean, scalable code.

Cooperative Student Game Design and Developer: Simon Meyer is a senior in UW-Stout's B.F.A. Game Design and Development–Art program. Before transferring to UW-Stout, he earned an AAS in Web and Interactive Media at Minneapolis Community and Technical College. Simon has worked on a variety of website, software, and video game development projects.

User Experience Consultant: Aram Wahler is a graduate student in UW-Stout's M.F.A. in Game Design program. Aram's primary focus is Games Research and User Experience (GRUX), specifically in the area of Games UX Design. He is also a Research Assistant at UW-Stout, gaining and deploying his skills in UX research and design.

April 8, 2021

2021 REGENT SCHOLAR GRANTS

REQUESTED ACTION

Information only.

SUMMARY

The UW System Regent Scholar program provides prestigious, one-time grants to individual faculty or campus programs that undertake undergraduate research projects having the potential to foster innovation, entrepreneurship, and talent development.

Formally introduced in 2014, the program is designed to stimulate faculty-student collaborative research. Eligibility is open to all UW System universities, supporting entrepreneurial ideas and innovative projects with the goals of:

- Providing summer funding to support faculty engagement in research and other scholarly activities;
- Promoting stellar research experiences for undergraduate students, thus preparing a high-quality workforce;
- Stimulating research across all UW System campuses, ultimately driving regional economic development; and
- Recognizing superior and undergraduate research in the STEM disciplines and creative arts field at the Board of Regents level.

Presenters

- Tommy G. Thompson, President, UW System
- Bob Atwell, REDI Committee Chair
- Kyle Weatherly, Regent Scholar Program Chair

BACKGROUND

Faculty from across UW System submitted entries for consideration. These submissions were evaluated by a committee of reviewers with technical, scientific, and business backgrounds. The 2021 team included the following experts:

Program Oversight:

- Jennifer Souter and Arjun Sanga, WiSys

Project Evaluators:

- Jon Bartz, Regional Director, Wisconsin Economic Development Corporation
- Dr. Tracy Davidson, Director, STEM and Applied Research Initiatives, UW System
- Peter Dulcamara, Chief Scientist & Technical Vice President, Kimberly Clark Corporation
- Preeti Gupta, Manager, External Innovation, Promega Corporation
- Dr. Erin L. Henry, Senior Director, Venture Platform, Northwestern Mutual
- Cory Mason, Business Consultant, Retired. Former Chief Information Officer for Twin Disc, Inc., and previously head of Global IT Architecture for SC Johnson.

The evaluation team selected the three recipients to receive the highest honor for faculty achievement for undergraduate research projects having the potential to foster innovation, entrepreneurship, and talent development, as follows:

2021 UW System Regent Scholar Grants

Dr. Francis “Frannie” Mann

Associate Professor

University of Wisconsin-Parkside

Research Summary: Characterization of a Novel Bactericidal Compound

Novel antibiotic scaffolds are one of medicine’s greatest needs, as bacteria continue their race to evolve antibiotic resistance. Earlier work by this principal investigator discovered that a specific combination of enzymes from the bacterium *Mycobacterium tuberculosis* can cause cell death in the heterologous host *Escherichia coli* (E.coli). Later, in vitro studies determined that a novel compound is generated by these enzymes. The proposed research aims to generate industrial quantities of this compound for assessment of selectivity, toxicity, and its mechanism of action (MOA). Together, these experiments will allow the team to assess the potential of this compound as a lead molecule for further antibiotic development.

Dr. Haijian Sun

Assistant Professor

University of Wisconsin-Whitewater

Research Summary: A Multi-Modal Deep Sensor Fusion System for Reliable and Faster, Next-Generation Wireless Vehicle Communications

Connected and automated vehicles (CAVs) have become a transformative technology that can change society's daily life. Research on CAVs generally falls in two categories: "automated" and "connected." While a focus on "automated" solutions has brought disruptive technologies that significantly enhance self-driving capabilities, the path to "connected" strategies as an essential function to connect other cars or roadside units is often overlooked. As a result, its development is largely lagging behind. Currently, millimeter-wave (mmWave) cellular bands are identified as a promising vehicle connectivity solution. While this technology can provide high data rates, its implementation faces many challenges such as high attenuation during signal propagation and mobility management. In this study, the team proposes to integrate inputs from multi-sensor systems, including LiDAR (Light Detection and Ranging), cameras, and ultrasonic detection to facilitate vehicle communications. This multimodal data-fusion approach, together with Artificial Intelligence, promises to bring significant advances in "connected research."

Dr. Ava Udvardia

Associate Professor

University of Wisconsin-Milwaukee

Research Summary: Enhancers for Next Generation Gene Therapy Vectors to Treat Optic Neuropathies

Damaged optic nerves resulting from glaucoma and other optic neuropathies do not spontaneously regenerate, leading to permanent loss of visual function. One reason is that nerve cells in the mature central nervous system (CNS) are unable to genetically reprogram to grow and re-establish the broken neural circuitry. Gene therapy vectors are promising avenues for treating ocular diseases; however, the lack of regeneration-specific regulation of genes contributes to toxic side effects. The proposed research aims to validate novel regeneration-specific gene promoters and enhancers for use in next-generation gene therapy vectors to promote CNS nerve regeneration.