



# ACHIEVE

RESEARCH & GRANTS ACTIVITIES @ ROBERT MORRIS UNIVERSITY • 8th Edition Volume 2 • Spring 2023

## Vice President’s Message

The Research & Grants Administration (R&GA) is happy to share the Spring 2023 issue of the R&G Newsletter. We hope this newsletter will play an important role in showcasing research & grant activities at RMU.

In this issue, we feature three grant applications submitted by RMU faculty from September to December 2022. A few grant applications are not listed due to their sensitive nature. The summaries presented here are in the Principal Investigators’ own words. Some of these applications have been awarded and others are pending. For this period, a record eighteen opportunities were discussed/explored and thirteen proposals were submitted. Most grant proposals were written by our faculty and staff with support from Research & Grants Administration, and Financial Operations. As always, supporting institution data was provided by the Office of Institutional Research.

The Research & Grants Administration encourages all faculty and staff to pursue research and participate in various research & grants related activities. The R&GA is available to help you answer questions related to grant searching, writing, budgeting, and managing. Please contact us with your questions, comments, suggestions, and concerns.

Happy New Year and have a great Spring semester!

Sincerely,

### Sushil Acharya

*Vice President for Grants, Research, and Global Initiatives*

*Acting Chief Faculty Development and Global Initiatives Officer*

*Professor of Software Engineering*



## ➤ Research Initiation Initiative for a Secure and Trustworthy Cyberspace (SaTC): Scalable and Context-Aware Label Flipping Data Poisoning Attack on Human Activity Recognition Systems

Grant Agency: National Science Foundation (NSF)

The advancement of wearable sensor technologies, sensor-rich smartphones, and their connectivity to cloud servers over the internet have paved the way for incredible research efforts in developing intelligent human activity recognition (HAR) systems. As a machine learning (ML)-based system, a HAR system depends on the scale of the training data, which practically requires outsourcing the curation of the data. This open data collection process makes the ML models susceptible to data poisoning attacks.

The proposed project revolves around the study of a label flipping attack, a subclass of data poisoning attack, where the label of a sensor reading is maliciously changed in the data collection phase to mislead a HAR model to produce erroneous, costly, and even life-threatening outcomes. The proposal presents the development of a framework to systematically investigate label flipping data poisoning attacks and approaches to defend against the threats to design, build, and operate secure and resilient ML models for HAR systems through the following initiatives: (1) facilitate research independence, (2) research adversarial machine learning for Internet of Things systems, (3) create an open-source platform to facilitate transitioning the research into practice, (4) distribute research outcome through high-impact research venues, and (5) utilize the research outcome into educational initiatives.

### Grant Proposal Activities July to December 2022

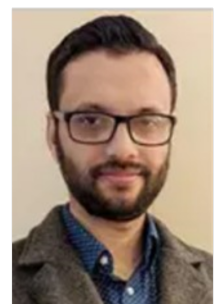


Grant Opportunities



Grant Proposals

**Abdur Shahid**  
*Principal Investigator*  
Assistant Professor of Computer  
and Information Systems  
SIHSS



## ➤ **Extended Reality: Active Engagement in STEM for Students with Disabilities**

Grant Agency: **Institute of Education Sciences**

Access to technology, particularly emerging extended reality technology, provides opportunities and support for students with disabilities to engage with inaccessible content. This is of particular interest in the area of STEM. Lack of systematic training and as time to master new technologies and assistive technologies, along with financial costs associated with technology are factors limiting the implementation of these promising technologies in K-12. Drs. Donne and Hansen submitted a grant application with the National Center for Special Education Research (NCSER), one of the centers in the Institute of Education Sciences, for ~\$800,000. Professor Andrew Ames will assist as subject-matter expert. Grant proposal is currently under review. This four-year development and innovation project aims to:

- 1) Establish an Extended Reality Kit with equipment special education teachers can borrow from RMU's Education department lending library for use in their K-12 classrooms;
- 2) Create professional development for special educators on STEM-focused extended reality; and
- 3) Collaboratively develop extended reality enhanced STEM units with special education teachers from three different K-12 schools, and track teacher and student outcomes as teachers pilot these units with their students with disabilities.



**Vicki Donne**  
*Principal Investigator*  
Univ. Professor of Education  
SIHSS



**Mary Hansen**  
*Co-Investigator*  
Univ. Professor of Education  
SIHSS



**Andrew Ames**  
*Subject Matter Expert*  
Professor of Media Arts, SIHSS  
Coordinator, Media Arts Gallery

## ➤ **Integrating Social-Emotional Learning into the Curriculum: A Professional Development Program**

Grant Agency: **Grable Foundation**



**Patty Kardambikis**  
*Principal Investigator*  
Assistant Professor of  
Education, SNEHS  
Coordinator, Principal  
Certification

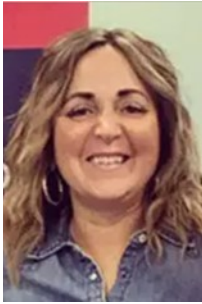
Social-Emotional Learning (SEL) programs, when implemented well can produce substantial benefits to students that include improved behavior and mental health, and improved academic performance. SEL includes the competencies children and adults use to interact effectively with others, to form and maintain positive relationships. During the 2022-2023 School-year, SEL will be added as a Pathway option for Cornell School District's teaching staff. Dr. Patricia Kardambikis will facilitate the professional development during the six professional development days throughout the 2022-2023 school year. This will include small group work and an individual check-in with each teacher.

The integration of SEL into the curriculum is the first step in the process of developing Cornell's School District's "SEL Theory of Action Plan" including a vision and mission statement along with short- and long-term goals for the forward movement of SEL within the District and community. A SEL Committee has been planned to assist in the development of the SEL Action Plan. Cornell School District will also provide this training to neighboring school district's teachers to provide a model program in the implementation of SEL into the curriculum and the development of an SEL Theory of Action Plan.

## Innovative Teacher to Practice

Grant Agency: **Pennsylvania Department of Education (PDE)**

RMU, in collaboration with West Allegheny and South Fayette school districts, applied for a PDE Innovative Teacher to Practice grant. If funded the project will support the creation of learning modules addressing culturally relevant and sustaining educational practices (CRSE). CRSE has recently been recognized by PDE as an integral piece of teacher preparation programs. The co-created modules will focus on 8 overarching topics including (but not limited to) reflecting on one's own cultural lens, addressing bias in the system, authentic engagement practices, and viewing all students as capable of success. These modules will be utilized with pre-service teachers, and to support a future cohort from The Aspiring Teacher Fellowship Academy (AFTA).



**Susan Parker**  
*Principal Investigator*  
Department Head, Education  
Professor of Education  
SIHSS



**Nathan Taylor**  
*Co-Investigator*  
Assistant Professor of  
Education  
Multicultural education, social  
studies education, gender and  
sexuality studies, SNEHS



**Michael Quigley**  
*Co-Investigator*  
Associate Professor of  
Organizational Leadership, SIHSS  
Project Director, BMLDI Research  
and Grant Administration



**James Bernauer**  
*Co-Investigator*  
Univ. Professor of Education  
SNEHS

**Jen Tepe**  
*Co-Investigator*  
Assistant Professor of  
Education, SIHSS



## Vision 2030 and Sport: Robert Morris University Seeks to Engage with a Changing Kingdom of Saudi Arabia

Grant Agency: **U.S. Department of State**

Dr. Anthony Moretti submitted a concept paper for a potential grant to the U.S. Department of State in October associated with the department's interest in promoting educational, athletic and cultural opportunities within the Kingdom of Saudi Arabia.

The grant proposal outlined a series of lectures that multiple RMU faculty and staff might deliver to Saudi universities. These presentations would focus on forming sports communication courses/programs, creating athletic departments, enhancing the overall commitment to sport within the Kingdom and highlighting fitness. In addition, RMU athletics teams would visit the Kingdom to showcase their sport and to promote participation in sport to young women and girls. Finally, the grant examined how RMU and Saudi faculty might work together on research topics pertaining to the areas mentioned above.



**Anthony Moretti**  
*Principal Investigator*  
Associate Professor of  
Communication  
SIHSS

**Anthony Moretti**  
*Principal Investigator*  
Associate Professor of  
Communication, SIHSS



## ➤ **Education for American Civic Life Initiative**

### **Grant Agency: Teagle Foundation**

Dr. Anthony Moretti submitted a concept paper for a potential grant to the Teagle Foundation in November associated with the foundation's intent to promote Education for American Civic Life. Drs. Soren Fanning and Tim Jones will serve as co-PIs, if the grant application is successful. The team intends to conduct the following activities to promote civic education:

- ◆ Provide regular civic engagement programming, relating to the topics of voting, positive civic discourse and more, to the campus and area communities;
- ◆ Offer presentations to the campus and area communities about important historical figures from the region who championed civic discourse;
- ◆ Coordinate with the League of Women Voters and like organizations to host political forums and debates, and to lead voter registration drive;
- ◆ Engage with leading experiential learning organizations, such as The Washington Center, so that RMU students can participate in these activities;
- ◆ Live stream and record activities associated with the grant so that students interested in journalism, broadcasting and TV production careers may expand their skills. Recorded activities will be stored by the university and made available at no cost to faculty across the institution and to partnering organizations.



**Soren Fanning**  
*Co-Investigator*  
Associate Professor of History  
Coordinator, Secondary Social  
Studies Education, SIHSS

Through these initiatives, the group seeks to achieve the following:

- ◆ Enhance the understanding within RMU students and area residents about the necessity to be an informed and active citizen;
- ◆ Foster regular interactions between the university and area communities; and
- ◆ Endorse civic awareness through annual Civic Discourse Week events at RMU.

**Tim Jones**  
*Co-Investigator*  
Director, Academic Media  
Center  
Assistant Professor of  
Media Arts



## **Healthcare Adventure Leading to a Passport for the Future**

### **Grant Agency: Hatcher Family Foundation**

A \$3000 grant has been received to cover the expense of the Fall (October 2022) and the Spring (April 2023) on-campus visits for the Healthcare Professional High School Mentoring Program. The goal of the program is to “enlighten and educate high school students about different career opportunities available in the healthcare industry”.

Two years ago, Dr. Hampe started this program with Quaker Valley High School. The program meets the Department of Education requirement for six hours of mentoring for the students. With the help of Dr. Frndak, the program has grown from one high school to 18 high schools. The program runs along the school calendar and is offered at no cost to the high schools. The 2022-2023 program is entitled Healthcare Adventure Leading to a Passport for the Future. The students can work to earn their “passport” by attending both on-campus visits as well as four out of five monthly programs. In October 2022, the program was introduced to the students interested in health care on the RMU campus, providing an overview of the healthcare industry.

- The on-campus visit included a scavenger hunt/tour of RMU along with a panel discussion of RMU students and faculty. A calendar of topics was reviewed. These topics include health care administration, nursing, advanced medical imaging technology, psychology, and population health/health sciences.
- The monthly zoom programs, November through March, include testimonials from the focused health care expert, student and faculty. The program is recorded and sent out to the high school coordinators to be shared with the students unable to attend or the student's parents.

In April 2023, the students are again invited to RMU campus for a day of learning, networking and hearing from RMU students and faculty.

Following the academic year, a research project, entitled “How a University Sought to Increase the Pipeline in Health Care Careers through exposure to Healthcare Professionals” through a pre and post survey of the students and high school leaders regarding changes in level of interest in healthcare professions, will be conducted.



**Holly M. Hampe**  
*Principal Investigator*  
Associate Professor, SNEHS,  
Program Director, Health Service

**Diane Frndak**  
*Co-Investigator*  
Assistant Professor, SNEHS,  
Health Service Administration



## **➤ Leadership by Design: Expanding the Principal Pipeline**

**Grant Agency: Pennsylvania Department of Education**

The goal of this project, “Leadership by Design: Expanding the Principal Pipeline,” is to create a pipeline of highly effective school leaders with the appropriate skills and tools to increase student achievement and to improve school climate. The job of the school principal has become much more complex and demanding over the past several decades (Tintore, et al. 2020). Principals must know how to meet the needs of learners in an increasingly diverse population and technologically complex environment. This project is a partnership between Robert Morris University (RMU), Propel Schools, Inc., and the Commonwealth Charter Academy. “Leadership by Design: Expanding the Principal Pipeline”, will provide enhanced clinical experiences within preparation programs as well as assistance during the transition into a school leader position following certification. A well-designed induction program can support novice school leaders during their early years and can improve effectiveness as well as retention. The number of Principal Candidates completing their degrees at preparation programs in PA and earning school administrator certificates has dropped 37% from 980 in 2010/11 to 621 in 2018/19 (PDE, 2021). Urban education in much of the U.S. faces significant challenges, including the quality of Principals and the financial needs of Principal Candidates. Frequent Principal turnover leads to a constant flux of inexperienced school leaders, and has a negative effect on school performance and teacher retention. Together, RMU, Propel and Commonwealth Charter School hopes to address the need for diverse, trained, and highly effective school leadership.



**Patty Kardambikis**  
*Principal Investigator*  
Assistant Professor of Education, SNEHS  
Coordinator, Principal Certification

**In addition, proposals were submitted for the following projects: Sports & Exhibition Authority - Sports Event Funding (SEF) grant; Pennsylvania Department of Education - It's On Us grant; and Pennsylvania Department of Education - PA Hunger-Free Campus grant.**

### **Contact:**

Sushil Acharya, *Vice President*                      [acharya@rmu.edu](mailto:acharya@rmu.edu)      412-397-4023  
Patricia Centofanti, *Grants and IRB Specialist*      [centofanti@rmu.edu](mailto:centofanti@rmu.edu)      412-397-6227

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