NDSU | COLLEGE OF ENGINEERING

# COLLEGE HAPPENINGS

September 14, 2021

## FROM THE ASSOCIATE DEAN

**Engineering Leadership Path in MyNDSU**

One of the four strategic initiatives that came out of the College of Engineering's pre-pandemic strategic planning exercise was to focus on developing the leadership and innovation skills of our students. We know that these skills are important to the employers who recruit our graduates, and we want to give our students every opportunity to advance in their careers when they leave NDSU.

In a way, the pandemic helped to give us time to think through some different options related to this strategic initiative. We decided to create an optional co-curricular program that would encourage students to stretch themselves by engaging in leadership development activities and reflection, while keeping it very attainable for any student who was interested. The program is set up through the MyNDSU system and is loosely modeled after the GPS (Graduate Professional Skills) Academy that the Graduate School has been promoting for the past several years.

If a student completes all 6 of the Core (required) activities and 16 elective activities in the Engineering Leadership Path, their completion will be noted on their official NDSU transcript. Although the activities and associated learning are what is most important, we hope that documenting completion on the transcript will give students the motivation to pursue it and the confidence to talk about it with employers. Required and elective activities are distributed in the following five domains:

- Leadership Development
- Communication and Teamwork
- Professionalism
- Diversity, Equity, and Inclusion
- Leadership Experience.

All CoE undergraduate students and faculty have been added to the Path, so you can log in to MyNDSU yourself and see upcoming activities that students can participate in. Matt Warner is the graduate student who was responsible for much of the behind-the-scenes organization for the GPS Academy, and he is working with us this year as we fill in program options and promote it to our students. Students will be hearing more about it in the coming weeks through emails and presentations at club meetings, and I hope academic advisors will promote it as they talk about professional development with their advisees.

*Scott Pryor, Associate Dean for Undergraduate Programs*

## IN THE NEWS

NDSU receives federal funding for energy storage research

NDSU Society of Women Engineers on North Dakota Today

## CONGRATULATIONS

Please let *College Happenings* know about honors, awards, new grants and other announcements so we can share them with other faculty and staff.

## UPCOMING EVENTS

Saturday, September 25, 4th **Annual North Dakota Biomedical Engineering Symposium**. 8:30 a.m. to 5:00 p.m. at the UND Center for Innovation. Registration is free and can be completed here.

Friday, October 8, **College of Engineering Homecoming Showcase**. 12:00 – 1:30 p.m. in the Oċeti Śakȍwiŋ Ballroom.

Wednesday, October 13, **Faculty Council meeting**. 12:00 – 1:00 p.m. CME Auditorium or Zoom.

Wednesday, October 20, **Department of Defense Regional DEPSCoR Day**. The event is hosted by the University of South Dakota. Get more information and register here: www.usd.edu/research/depscor-dod-day

Tuesday, November 9, **Faculty Council meeting**. 12:30 – 1:30 p.m. FLC 122 or Zoom.

## CREATING CONNECTIONS VIRTUAL WORKSHOP

The ND EPSCoR State Office is sponsoring a "Creating Connections" workshop by the Alan Alda Center for Communicating Science on September 28 at 2:00 p.m. "Creating Connections" is a two-hour live, online workshop. The Alda Method is a unique approach to science communication training that combines improvisational theatre-based techniques with message design strategies, including analogies and narrative.

This immersive method emphasizes two-way communication to build trust and invite others to share in the wonder and joy of science. The process incorporates research and best practices from science communication, journalism, ethics, and other relevant fields. Contact Shireen Alemadi with questions about this workshop. *Register to attend >>*

## NIH VIRTUAL GRANTS SEMINAR

The National Institutes of Health Virtual Seminar on Grants Administration and Program Funding will be held November 1-4, 2021.

Registration is now open. The seminar will include opportunities to:

- learn about NIH grant processes, policies, and programs;
- interact with NIH program, grants management, review, and policy staff;
- gather resources to use and share with colleagues;
- engage and network with your peers; and
- meet 1:1 with NIH experts.

For more information and to register, visit https://nihvirtualseminar2021.vfairs.com/. If you have questions about this virtual conference, please contact: NIHRegionalSeminars@nih.gov

## FUNDING OPPORTUNITIES

**DoD: Young Investigator Program**

The Office of Naval Research (ONR) is interested in receiving proposals for its Young Investigator Program (YIP) [N00014-21-S-F008]. ONR's Young Investigator Program seeks to identify and support academic scientists and engineers who are in their first or second full-time tenure-track or tenure-track-equivalent academic appointment, who have received their PhD or equivalent degree on or after January 1, 2014, and who show exceptional promise for doing creative research.

Proposals addressing research areas which are of interest to ONR Program Officers will be considered. See a full list here.

Applicants are *strongly encouraged* to contact the appropriate Program Officer who is the point of contact for a specific technical area to discuss their research ideas before submitting a proposal. A list of most Program Officers and their contact information can be found here. Please see full text of the funding opportunity announcement for more details.

*Deadline: October 29, 2021*

**NSF / NIH: Smart Health and Biomedical Research in the Era of AI and Advanced Data Science**

The purpose of this interagency program solicitation [NSF 21-530] is to support the development of transformative high-risk, high-reward advances in computer and information science, engineering, mathematics, statistics, behavioral and / or cognitive research to address pressing questions in the biomedical and public health communities. Transformations hinge on scientific and engineering innovations by interdisciplinary teams that develop novel methods to intuitively and intelligently collect, sense, connect, analyze and interpret data from individuals, devices and systems to enable discovery and optimize health. Solutions to these complex biomedical or public health problems demand the formation of interdisciplinary teams that are ready to address these issues, while advancing fundamental science and engineering.

*Deadline: November 10, 2021*

**NSF: Cyber-Physical Systems**

Cyber-physical systems (CPS) are engineered systems that are built from, and depend upon, the seamless integration of computation and physical components. Advances in CPS will enable capability, adaptability, scalability, resiliency, safety, security, and usability that will expand the horizons of these critical systems.

The CPS program [NSF 21-551] aims to develop the core research needed to engineer these complex CPS, some of which may also require dependable, high-confidence, or provable behaviors. Core research areas of the program include control, data analytics, and machine learning including real-time learning for control, autonomy, design, Internet of Things (IoT), mixed initiatives including human-in- or human-on-the-loop, networking, privacy, real-time systems, safety, security, and verification. By abstracting from the particulars of specific systems and application domains, the CPS program seeks to reveal cross-cutting, fundamental scientific and engineering principles that underpin the integration of cyber and physical elements across all application domains. The program additionally supports the development of methods, tools, and hardware and software components based upon these cross-cutting principles, along with validation of the principles via prototypes and testbeds. This program also fosters a research community that is committed to advancing education and outreach in CPS and accelerating the transition of CPS research into the real world.

Proposals for three classes of research and education projects—differing in scope and goals—are supported through the CPS program:

- **Small** projects may request a total budget of up to $500,000 for a period of up to 3 years. They are well suited to emerging new and innovative ideas that may have high impact on the field of CPS. *There is no deadline for small projects*.
- **Medium** projects may request a total budget ranging from $500,001 to $1,200,000 for a period of up to 3 years. They are well suited to multi-disciplinary projects that accomplish clear goals requiring integrated perspectives spanning the disciplines. *There is no deadline for Medium Projects*.

- **Frontier** projects must address clearly identified critical CPS challenges that cannot be achieved by a set of smaller projects. Furthermore, Frontier projects should also look to push the boundaries of CPS well beyond today's systems and capabilities. Funding may be requested for a total of $1,200,001 to $7,000,000 for a period of 4 to 5 years. *Deadline: December 15, 2021*

## RECENTLY FUNDED GRANTS

- Adam Curtis Gladen (PI), Yao Yu (CPI). Development of a thermochemical, nanocellulose-based material for thermal energy storage. $1,306,747 from the Department of Energy. 01/01/2022 – 12/31/2024.

## RECENTLY SUBMITTED PROPOSALS

- Mijia Yang (PI), Zhili Gao (CPI). Effective Strategies to Extend Remaining Life of ASR-Affected Pavements. $114,782 from the MN Department of Transportation. 07/1/2022 - 01/31/2024.
- Mijia Yang (PI), Long Jiang (CPI). Assessment of Alternative Pozzolans for Use in Minnesota Concrete. $151,264 from the MN Department of Transportation. 07/01/2022 - 06/30/2024.
- Yao Yu (PI), Mijia Yang (CPI), Qifeng Zhang (CPI). Solar Roadway Lighting. $149,833 from the MN Department of Transportation. 07/01/2022 - 06/30/2024.

## RECENT PUBLICATIONS

*For 2021, 165 publications by authors with the College of Engineering affiliation have appeared in various journals, according to the ISI Web of Science and submissions from faculty. Here are some of the most recent publications:*

- Akbar, Saeed, Saif Ur Rehman Malik, Kim-Kwang Raymond Choo, Samee U. Khan, Naveed Ahmad, and Adeel Anjum. 2021. "A Game-Based Thermal-Aware Resource Allocation Strategy for Data Centers." *IEEE Transactions on Cloud Computing* 9 (3): 845–53. https://doi.org/10.1109/TCC.2019.2899310.
- Arefinia, Ali, Omid Bozorg-Haddad, Khaled Ahmadaali, Javad Bazrafshan, Babak Zolghadr-Asli, and Xuefeng Chu. n.d. "Estimation of Geographical Variations in Virtual Water Content and Crop Yield under Climate Change: Comparison of Three Data Mining Approaches." *Environment Development and Sustainability*. Accessed September 9, 2021. https://doi.org/10.1007/s10668-021-01788-0.
- Lavadiya, Dayakar N., Hizb Ullah Sajid, Ravi K. Yellavajjala, and Xin Sun. n.d. "Hyperspectral Imaging for the Elimination of Visual Ambiguity in Corrosion Detection and Identification of Corrosion Sources." *Structural Health Monitoring-an International Journal*, 14759217211041690. https://doi.org/10.1177/14759217211041690.
- Oliazadeh, Arman, Omid Bozorg-Haddad, Melika Mani, and Xuefeng Chu. n.d. "Developing an Urban Runoff Management Model by Using Satellite Precipitation Datasets to Allocate Low Impact Development Systems under Climate Change Conditions." *Theoretical and Applied Climatology*. Accessed September 7, 2021. https://doi.org/10.1007/s00704-021-03744-4.
- Rashid, Umma S., Tonoy K. Das, Tamil S. Sakthivel, Sudipta Seal, and Achintya N. Bezbaruah. 2021. "GO-CeO2 Nanohybrid for Ultra-Rapid Fluoride Removal from Drinking Water." *Science of the Total Environment* 793 (November): 148547. https://doi.org/10.1016/j.scitotenv.2021.148547.
- Rezaee, Alireza, Omid Bozorg-Haddad, and Xuefeng Chu. 2021. "Reallocation of Water Resources According to Social, Economic, and Environmental Parameters." *Scientific Reports* 11 (1): 17514. https://doi.org/10.1038/s41598-021-96680-2.
- Rotz, C. Alan, Senorpe Asem-Hiablie, Erin L. Cortus, Mindy J. Spiehs, Shafiqur Rahman, and Anne M. K. Stoner. 2021. "An Environmental Assessment of Cattle Manure and Urea Fertilizer Treatments for Corn Production in the Northern Great Plains." *Transactions of the ASABE* 64 (4): 1185–96. https://doi.org/10.13031/trans.14275.
- Shabani, Afshin, Xiaodong Zhang, Xuefeng Chu, and Haochi Zheng. 2021. "Automatic Calibration for CE-QUAL-W2 Model Using Improved Global-Best Harmony Search Algorithm." *Water* 13 (16): 2308. https://doi.org/10.3390/w13162308.

- Straub, Jeremy. 2021. “Assessment of Gradient Descent Trained Rule-Fact Network Expert System Multi-Path Training Technique Performance.” *Computers* 10 (8): 103. https://doi.org/10.3390/computers10080103.
- Wang, Hui, Wenfeng Du, Yannan Zhao, Yingqi Wang, Runqi Hao, and Mijia Yang. 2021. “Joints for Treelike Column Structures Based on Generative Design and Additive Manufacturing.” *Journal of Constructional Steel Research* 184 (September): 106794. https://doi.org/10.1016/j.jcsr.2021.106794.
- Wu, Xiang-Fa, Youhao Zhao, and Oksana Zholobko. 2021. “Stress-Function Variational Method for Accurate Free-Edge Interfacial Stress Analysis of Adhesively Bonded Single-Lap Joints and Single-Sided Joints.” *Journal of Composites Science* 5 (8): 197. https://doi.org/10.3390/jcs5080197.


See your name on this list? Help us get the word out about your amazing work by submitting it as a **Breakthrough Alert**. **This online form** is an easy, step-by-step guide for summarizing published research for the general public.

*College Happenings* is distributed to the NDSU College of Engineering staff and faculty every other Tuesday.

Read past issues of *College Happenings* here.

Deadline for submissions to *College Happenings* is 12:00 p.m. Fridays.

Contact kyle.bosch@ndsu.edu to submit items for *College Happenings*.

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