Annual Report FY18

INSTITUTE OF COMPUTING AND CYBERSYSTEMS

The research arm of the Alliance for Computing, Information, and Automation

ICC
institute of computing & cybersystems

CPS
Center for
Cyber-Physical Systems

CyberS
Center for Cybersecurity

DataS
Center for Data Sciences

HCC
Center for
Human-Centered Computing

SAS
Center for
Scalable Architectures and Systems

ACIA
ALLIANCE FOR COMPUTING,
INFORMATION & AUTOMATION

Michigan Technological University
1885

The mission of the ACIA is to create a scholarly environment for teaching and research in computing, information, and automation that is a reflection of contemporary technological innovation in industry and society at large.

ACIA
ALLIANCE FOR COMPUTING,
INFORMATION & AUTOMATION

Annual Report

July 1, 2017 - June 30, 2018

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From the Director

Dear Friends,

I hope that you are all enjoying the first semester of AY 2018-19. With all that's happening in the realm of computing and cybersystems–from the U.S. President's Executive Order on Artificial Intelligence to the announcement of the formation of a new College of Computing at Michigan Tech–we have plenty to dig into in this new calendar year!

First, let me say that it is an honor that I was supported and appointed as the new ICC Director in August 2018. Thank you to all the ICC members for supporting my nomination; I am very pleased to serve in this position for the next three years. As you know, the ICC was formed by Dr. Min Song three years ago to promote research and learning experiences in computing and cybersystems for the benefit of Michigan Tech and society. I would like to thank Dr. Song for his vision and leadership over the last three years; the ICC saw significant growth in that time period, far exceeding initial goals.

Sincere thanks and congratulations as well to the ICC's exceptional group of member faculty and staff and your scholarship and research contributions in the fields of computing. Our research expenditures in FY18 were $1.9 million and we were awarded nearly $3 million in new projects. We currently have $7.3 million in active grants and over $10 million in pending proposals. These are very strong indicators of our successes.

As ICC director, my aim is continued growth focused on fostering innovation and new discoveries in computing, encouraging interdisciplinary and multidisciplinary collaborations across campus and with other institutions, and growing the ICC's national and international reputation and visibility.

I would like to draw attention to a few new projects. Shane Mueller, HCC, was awarded a DARPA XAI (explainable AI) project amongst a very competitive field. This project is in the pertinent field of how to create artificial intelligence that is not only effective but also understandable or interpretable. Several more ICC members were successful in obtaining new grants from NSF. Of note is Ye Sun, CPS, who was awarded an NSF CAREER award for her research on wearable electronics—Congratulations Dr. Sun! Lastly, I would like to congratulate Kevin Trewartha, HCC, for his project funded by the U.S. Dept. Health and Human Services. Dr. Trewartha is investigating behavior markers of cognitive impairment and Alzheimer's disease. And congratulations to all our members who received new funding in FY18. Keep up the great work!

Finally, please join me in welcoming Karen Johnson, our new Communications Director. Karen comes to the ICC from Michigan Tech's Office of Advancement.

Timothy C. Havens

FY18 Executive Summary

University Centers and Institutes

The ICC is one of more than 50 Centers and Institutes at Michigan Tech, which are intended to encourage interdisciplinary research projects larger in scope and/ or breadth than typically undertaken by individuals or small intradepartmental groups. To encourage these collaborative endeavors, the University provides incentives, including increased returns on research overhead, access to limited submission proposal opportunities, and support from the office of the Vice President for Research. In return, Centers and Institutes provide a positive return on investment (ROI) to the University, support the University's strategic direction, and provide a positive contribution to the University overall.

History

The Alliance for Computing, Information, and Automation (ACIA), founded in 2015, is an agreement among the departments of Electrical and Computer Engineering and Computer Science and the School of Technology to cooperate in academic program development and collaborate in research aimed at solving problems of national importance related to cybersecurity and computing. The Institute of Cybersystems and Computing (ICC) leads and promotes the research mission of the ACIA.

ICC Organization

The ICC is composed of five research centers, each pursuing research in a different computing discipline. A director and co-director provide Institue leadership, while associate directors lead the five Centers.

ICC Membership

The ICC's 50 members are from 5 schools and colleges and 15 departments.

The Michigan Tech Strategic Plan

The work of the ICC embodies in particular Goal 3 of the University's strategic plan, "Research, scholarship, entrepreneurship, innovation, and creative work that promotes a sustainable, just, and prosperous world." Further, President Rick Koubek's "Tech Forward" vision, which aims to position Michigan Tech as an internationally recognized academic thought leader in the Fourth Industrial Revolution, is fully embraced by the ICC and its membership. In fact, the 2014 proposal to create the ICC articulates as its vision the need to prepare for and respond to the Fourth Industrial Revolution.

Active Awards[1]

ICC active grants number 29, with a total dollar value of $7.3M. Of those, 6 were awarded in FY14, FY15, and FY16; 9 were awarded in FY17, 12 were awarded in FY18, and 2 were awarded in FY19.

Proposal Activity[2]

21 ICC proposals led by 14 ICC members as PIs, are pending, with a total value of $10.2M: 9 submitted by PIs in Electrical and Computer Engineering; 5 in Computer Science; 4 in School of Technology; 2 in Cognitive and Learning Services, and 1 in Mechanical Enginering-Engineering Mechanics.

Scholarship and Service

As detailed later in this report, ICC members are leaders in their research and academic fields, on and off campus. In FY18 ICC members collectively attended dozens of national and international academic meetings and conferences; published more than 150 journal articles, conference papers, book chapters, and books; presented dozens of papers, talks, and seminars; and provided prodigious professional service of many kinds to both Michigan Tech and professional and scientific societies and organizations of all kinds.

Education and Outreach Activities

Among FY18 outreach activities, the ICC hosted 16 scholars and creative professionals for a series of distinguished lectures and seminars and hosted the 24th Int'l Conference on Auditory Display (ICAD), June 10-15, 2018, on Michigan Tech's campus.

From the Editor

This report highlights the activities of the Institute of Cybersystems and Cybersecurity (ICC) for the period July 1, 2017 to June 30, 2018. The data and information in this report were gathered from a number of sources, including reports from the Sponsored Operations office, the Computer Science Department office, the Electrical and Computer Engineering Department office, ASPIRE, Digital Measures, Banner, and information shared by ICC Center directors and researchers. Every effort has been made to ensure accuracy and completeness. This report was prepared by Karen S. Johnson, Communications Director for the ACIA/ICC.

[1]as of 1/17/19
[2]as of 2/23/19

ICC by the Numbers

29 Active Grants
$7.3M

$1.9M Research Expenditures

18 New Grants
$2.9M

Research Activities	Year 1 Goal	Year 2 Goal	Year 3 Goal	Year 3 Results	Year 4 Goal	Year 5 Goal	Total
New Research Awards	1.6M	1.9M	2.2M	2.87M	2.5M	2.8M	11.0M
Research Expenditures	1.6M	1.7M	1.9M	1.88M	2.2M	2.6M	10.0M
No. of New Research Awards	6	7	8	18	9	10	40
No. of Proposals Submitted	35	37	40	21	43	47	202
External Visibility	Year 1 Goal	Year 2 Goal	Year 3 Goal	Year 3 Results	Year 4 Goal	Year 5 Goal	Total
Sponsored Conferences	4	5	6	2	7	8	30
Hosted Talks and Seminars	8	10	12	16	14	16	60
Demos Organized	2	3	4	1	5	6	20
Publications[1]	100	110	120	183	130	140	600
Member Leadership[2]	6	10	12	57	15	20	52
Member Keynote Talks	1	1	1	1	1	1	5
Member Invited Talks	4	4	4	44	5	5	22

[1]Books, Book Chapters, Journal Articles, Reports, Conference Papers
[2]Technical Committees, Journal Editorships, Conference Chairs

FY18

THE ALLIANCE FOR COMPUTING, INFORMATION, AND AUTOMATION AIMS TO ENCOURAGE A SCHOLARLY ENVIRONMENT AT MICHIGAN TECH THAT ALIGNS WITH CONTEMPORARY TECHNOLOGICAL INNOVATION IN INDUSTRY AND SOCIETY.
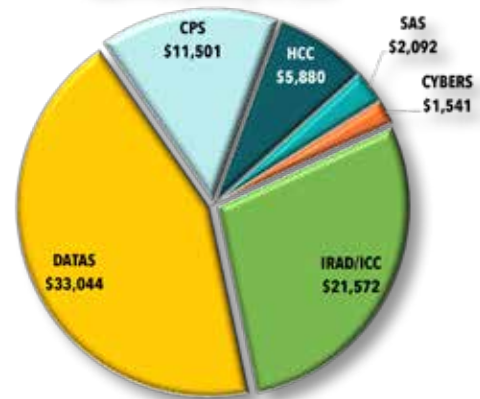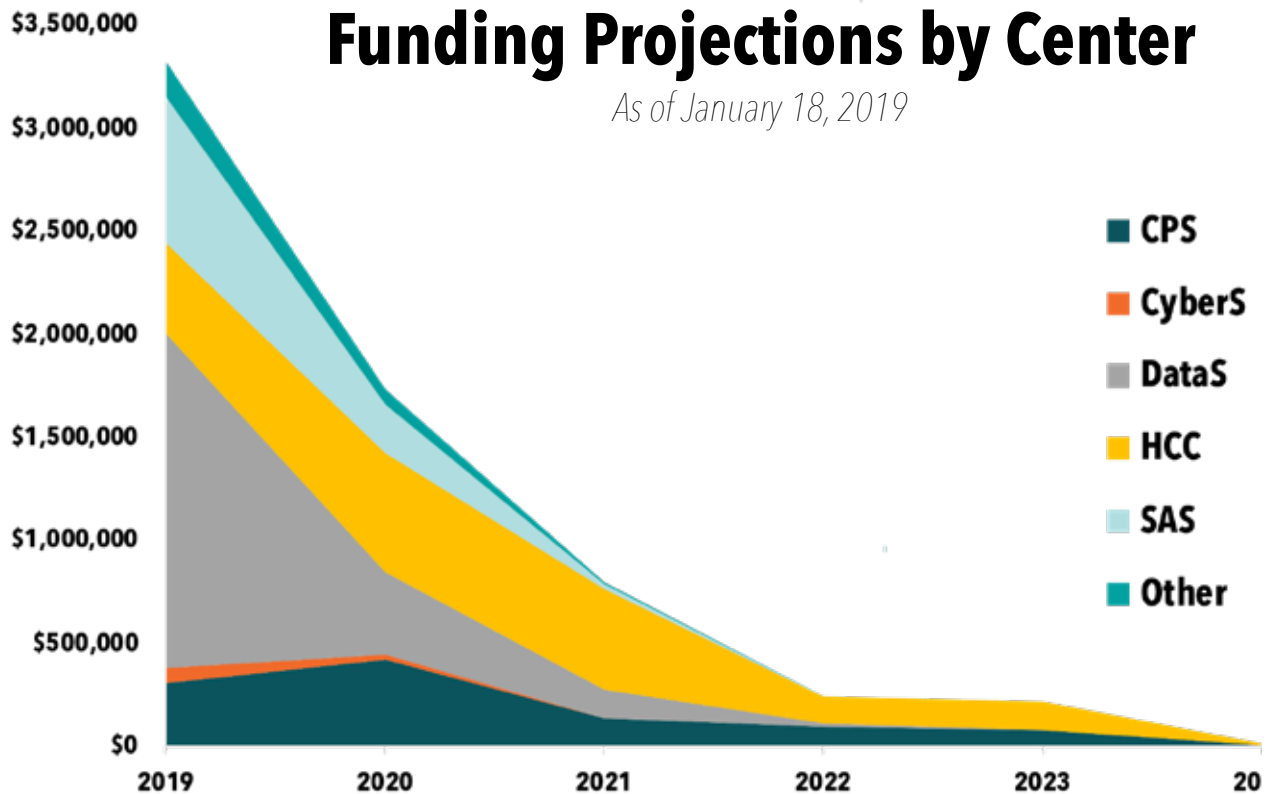
IRAD Returns

$100,000	
$80,000	
$60,000	
$40,000	
$20,000	
$0	
	FY14 FY15 FY16 FY17 FY18
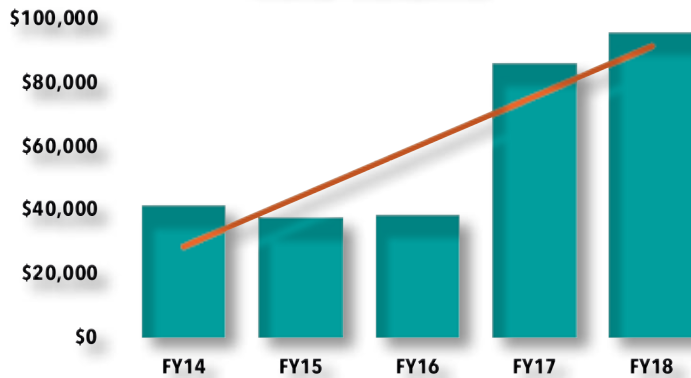
IRAD Dollars Spending - FY18
Total FY18 Spending: $75,630

- CPS $11,501
- HCC $5,880
- SAS $2,092
- CYBERS $1,541
- DATAS $33,044
- IRAD/ICC $21,572

Funding Projections by Center
As of January 18, 2019

$3,500,000	
$3,000,000	
$2,500,000	
$2,000,000	
$1,500,000	
$1,000,000	
$500,000	
$0	
	2019 2020 2021 2022 2023 20

- CPS
- CyberS
- DataS
- HCC
- SAS
- Other

ICC by the Numbers

CATEGORY	TOTAL
Academic Awards	13
Books & Book Chapters	11
Conference Chairs	5
Conference Committees	35
Conference Paper Reviewer	39
Conference Presentations	44
Conference Proceedings	90
Conferences Hosted	1
Distinguished Lecturers	16
Grant Reviewer	13
Invited Member Talks	44
Journal Articles	78
Journal Editorships	30

CATEGORY	TOTAL
Journals Reviewed	108
Media Attention: External	22
Reports	4
Sponsorships	4
Students Supported[1]	20
Technical Committees	13
University Service by ICC Members:	
Advisor to Club or Org.	26
Advisory Groups	5
Committees	73
Other	38
Pro Bono Prof. Services	2
Search Committees	10

[1]Tuition Awards and Hourly Wages

FY18

2018 ICC Achievement Awards

At its annual retreat, April 20, 2018, Achievement Awards were presented to five ICC members for their outstanding research and contributions in 2017-18. The recipients are, pictured above, left to right, Zhenlin Wang (SAS), Zhaohui Wang (CPS), Laura Brown (DataS), Keith Vertanen (HCC), Yu Cai (CyberS), along with founding ICC director Min Song.

24th Int'l Conf. on Auditory Display (ICAD)

The 24th International Conference on Auditory Display (ICAD) took place on Michigan Tech's campus June 10-15, 2018. Hosted by the departments of Cognitive and Learning Sciences and Computer Science, the College of Sciences and Arts, and the ICC's Center for Human-Centered Computing, the theme of the conference was, "Sonification as ADSR: Art, Design, Science, Research." Conference activities included presentations, workshops, tutorials, posters, a banquet, and a Sonification Concert at the Rozsa Center. M. "Philart" Jeon, pictured below, was General Chair of the conference's organizing committee.

- 80 Attendees
- 29 Full Papers
- 9 Extended Abstracts
- 6 Sonification Concert Pieces
- 4 Installation Pieces
- 106 Authors / 13 Countries (U.S., Italy, Japan, Germany, Chile, Bangladesh, Canada, UK, Austria, Spain, Finland, Sweden, Korea)
- 29 participants in NSF-supported ThinkTank Doctoral Colloquium (11 students, 8 panelists, and 10 observers)
- Industry participation: Volvo, HMC, Samsung, MeasuringU, Naval Research, NASA, Priority Designs Inc., Arts&Image

ICC Hosts TechTalk

The ICC hosted its first TechTalk on February 16, 2018. Presenters had up to five minutes to explain their research. The TechTalk was also a platform for eight researchers to present their proposals for the 2018 Paul Williams Seed Grant Competition. Topics included exascale computing, marine mobile networking, effective clustering algorithms, cybersecurity, on-body sensing, and IOT implementation. See page 9 for more information about the Williams Seed Grants.

HCC Demo Day

The ICC Center for Human-Centered Computing hosted HCC Demo Day Nov. 2, 2017, on campus. Activities pivoted around the theme, "Designing with humans in mind." Activites included a talk by ICC Distinguished Speaker Dr. Betty Whitaker and demos of student projects in the HCC's Mind Music Machine Lab, Smart City Technology Lab, Future Interactions Lab, and Virtual Reality Lab. The event was held in conjunction with the 2017 World Usability Day, an internationally-celebrated single day of events that brings together communities of professional, industrial, educational, citizen, and government groups for a common objective: to ensure that the services and products important to life are easier to access and simpler to use.

Visiting Professors

Generously funded by the House Family Foundation, the ICC hosted **2** visiting professors in FY 18.


Dave House

Dr. Steven Y. Goldsmith

held dual appointments in the Departments of Mechanical Engineering-Engineering Mechanics and Electrical and Computer Engineering. A Senior Fellow of the Technological Leadership Institute at the University of Minnesota, for 32 years Dr. Goldsmith worked at Sandia National Laboratories, retiring in 2011 as a Distinguished Member of the Technical Staff. While at Sandia, Dr. Goldsmith's work included developing information and control systems for applications including nuclear weapon testing, particle beam accelerators, and seismic array monitoring. While at Michigan Tech, Dr. Goldsmith worked on research using machine learning technology to diagnose anomalies in industrial control systems through co-simulation, primarily to identify malware in standardized control system architectures.

Dr. Zafar Iqbal

served as a Visiting Research Assistant Professor in the Department of Computer Science. Dr. Iqbal completed a Ph.D. in electrical engineering and computer science at the Gwangju Institute of Science and Technology (GIST), South Korea, in 2017. He has worked for ZTE Corporation, Shanghai R&D Center, China; Vieworks Co. Ltd. Korea; and Nokia Siemens Networks Co. Ltd., Shanghai. While on campus, Dr. Iqbal collaborated with the Center for Cyber-Physical Systems on underwater acoustic communication systems research, worked on developing a convex optimization problem solver algorithm, submitted an NSF research grant proposal on the topic of channel estimation and cooperation in vehicular networks, and published three research papers.
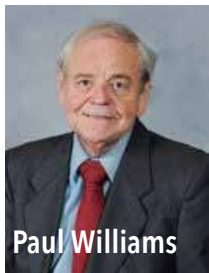
Paul Williams Seed Grant Recipients

Paul Williams

Michigan Tech alumnus Paul Williams supported two seed grants of $50K each in FY18. The competitive grants gave researchers the opportunity to develop seed projects that would eventually become viable and attractive for external grant funding. Seed grants like these are part of the ICC's commitment to fostering new ideas and investing in groundbreaking research.

Nina Mahnoudian

Keith Vertanen

Center for Cyber-Physical Systems
Zhaohui Wang, Assistant Professor, ECE
Nina Mahmoudian, Adjunct Professor, ME-EM

A Low-Cost Marine Mobile Networking Infrastructure

Existing research to understand underwater acoustic communication networks relies on human-operated surface ships or cost-prohibitive autonomous underwater vehicles (AUV). And, due to the cost barrier, academic research evaluation is often limited to computer simulations. Recognizing a gap in the research, Zhaohui Wang and Nina Mahmoudian combined their areas of expertise--underwater acoustic communications and low-cost marine robotics and AUVs--and took their research beneath the surface to develop a low-cost marine mobile infrastructure and investigate the challenges and possible solutions in engineering a leading-edge AUV communication network.

Center for Human-Centered Computing
Scott Kuhl, Associate Professor, CS
Keith Vertanen, Assistant Professor, CS

Appropriating Everyday Surfaces for Tap Interaction

What if an everyday surface, like a table, could be transformed into a rich, interactive surface that can remotely operate things like computers, entertainment systems, and home appliances? That's what ICC members Keith Vertanen and Scott Kuhl, along with two student researchers, set out to do with a $50K William Seed Grant. Their outcomes included a prototype virtual keyboard that supports typing at rates comparable to a touchscreen device; the first-ever acoustic sensing algorithm that infers a continuous two-dimensional tap location; and novel statistical models that quickly adapt to individual users and varied input surfaces.

FY18

THE ICC PROVIDES A PLATFORM FOR INNOVATIVE RESEARCH THROUGH SUPPORT, FACILITATION, AND COLLABORATION WITHIN AND OUTSIDE OF MICHIGAN TECH.

Distinguished Lecture and Seminar Series

In FY18 the ICC hosted **16** eminent scholars and creative professionals for a series of distinguished lectures and seminars in the fields of computing, facilitating the exchange of state-of-the-art research results and discussions about future research directions.

Tom Hou
Bradley Distinguished Prof. of Electrical and Computer Engineering, Virginia Tech, "Advances in Wireless Networking with Multiple Antennas," Apr. 27, 2018.

Kenneth M. Hopkinson
Prof. and Interim Head, Dept. of ECE, Air Force Institute of Technology, "Overcoming Communication, Distributed Systems, Simulation and Security Challenges," Apr. 20, 2018.

Indrajit Ray
Prof. of Computer Science, Colorado State Univ., "APTRON – Active Perception for adapTive Response in cOmplex Networks," Apr. 20, 2018.

Matthew Valenti
Prof., Lane Dept. of Computer Science and Electrical Engineering, West Virginia Univ., "IP-based Data Communications with Space: Architectures and Protocols," Apr. 13, 2018.

Robert Hoffman
Sr. Research Scientist, Institute for Human and Machine Cognition," An Integrated Theory of Macrocognitive Work Systems," Apr. 10, 2018.

Rishad Shafik
Assistant Professor of Electronic Systems, Newcastle Univ. UK, "The Age of Real-Power Computing," Apr. 3, 2018.

Mohammed Atiquzzaman
Edith J. Kinney Gaylord Presidential Prof., Univ. of Oklahoma, "IP-based Data Communications with Space: Architectures and Protocols," Apr. 6, 2018.

Shuai Wang
SAS Member, Lecturer, Computer Science, Michigan Tech, "Low Power Aging-Aware On-Chip Memory Structure Design by Duty Cycle Balancing," Mar. 23, 2018.

Andrew Ginter
VP, Industrial Security, Waterfall Security Solutions, "A View of Industrial Cyber Security, From Far Right On The Bell Curve with Applications to Consumer-grade Cyber-physical Systems," Mar. 20, 2018.

James M. Keller
Curators Prof., Electrical Engineering and Computer Science Dept., Univ. of Missouri, "Recognition Technology: Lotfi's look to the future from the late 1990s," Mar. 9, 2018.

Elizabeth Veinott
HCC Member, Assoc. Prof., Cognitive Learning Sciences, Michigan Tech, "Developing Problem Solving Skills in STEM students: From Dragon Slaying to Sense Making," Feb. 1, 2018.

Richard Brown
Professor, ECE, Worcester Polytechnic Institute, "Coherent Distributed MIMO Communication Systems (and Wireless Power Transfer)," Nov. 21, 2017.

Elizabeth Whitaker
Principal Research Engineer, Georgia Tech Research Institute, "How Can Cognitive Systems Support Humans in Solving Problems?" Nov. 2, 2017.

Deming Chen
Prof., Dept. of Electrical and Computer Engineering, Univ. of Illinois, Urbana-Champaign, "Hardware-Software Co-design and Heterogeneous Computing in the IoT Era," Oct. 6, 2017.

Kang G. Shin
Kevin and Nancy O'Connor Prof. of Computer Science, Prof., Electrical Engineering and Computer Science, Univ. of Michigan, "Internet of Things – Privacy, Security, and More," Sep. 28, 2017.

Jie Wu
Laura H. Carnell Prof., Dept. of Computer and Information Sciences, Coll. of Science and Technology, Temple Univ., "Algorithmic Crowdsourcing and Applications in Big Data," Sep. 22, 2017.

Active

Active Grants and Contracts

Active grants and contracts number **29**, with total awards of **$7,308,316**.

PI: Jeremy P. Bos, DataS, ECE
Title: Imaging Theory and Mitigation in Extreme Turbulence-Induced Anisoplanatism
Sponsor: U.S. Dept. of Defense
Award/Duration: $246,475 / 3 Yrs.
Date: 4/21/17

PI: Jeremy P. Bos, DataS, ECE
Co-PI: Darrell L. Robinette, ME-EM
Title: Robust Terrain Identification and Path Planning for Autonomous Ground Vehicles in Unstructured Environments
Sponsor: University of Michigan/U.S. Dept. of Defense
Award/Duration: $91,964 / 1.5 Yrs.
Date: 4/12/18

PI: Yu Cai, CyberS, SoT
Title: Developing Hands-on Cybersecurity Curriculum with Real-world Case Analysis
Sponsor: U.S. Dept. of Defense
Award/Duration: $149,184 / 1.5 Yrs.
Date: 3/31/17

PI: Yu Cai, CyberS, SoT
Co-PI: Kedmon N. Hungwe, CLS
Title: The Development and Assessment of Advanced Cybersecurity Curriculum
Sponsor: U.S. Dept. of Defense
Award/Duration: $322,002 / 2 Yrs.
Date: 9/14/17

PI: Zhuo Feng, SAS, ECE
Title: CAREER: Leveraging Heterogeneous Manycore Systems for Scalable Modeling, Simulation and Verification of Nanoscale Integrated Circuits
Sponsor: Nat'l Science Foundation
Award/Duration: $400,000 / 5 Yrs.
Date: 5/9/14

PI: Zhuo Feng, SAS, ECE
Title: SHF: Small: Scalable Spectral Sparsification of Graph Laplacians and Integrated Circuits
Sponsor: Nat'l Science Foundation
Award/Duration: $450,000 / 3 Yrs.
Date: 6/10/16

PI: Timothy C. Havens, DataS, ECE
Title: Algorithms for Look-Down Infrared Target Exploitation
Sponsor: Signature Research Inc./U.S. Dept. of Defense
Award/Duration: $40,000 / 1.5 Yrs.
Date: 12/17/18

PI: Timothy C. Havens, DataS, ECE
Co-PI: Timothy J. Schulz, DataS, ECE
Title: Distributed Array Processing for Aperture Level STAR
Sponsor: Massachusetts Institute of Technology/U.S. Dept. of Defense
Award/Duration: $50,000 / 1.5 Yrs.
Date: 1/9/18

PI: Timothy C. Havens, DataS, ECE
Co-PI: Timothy J. Schulz, DataS, ECE
Title: Heterogeneous Multisensor Buried Target Detection Using Spatiotemporal Feature Learning
Sponsor: U.S. Dept. of Defense
Award/Duration: $381,200 / 3 Yrs.
Date: 11/30/15

PI: M. "Philart" Jeon, HCC, CLS
Title: Development of the Safety Assessment Technique for Take-Over in Automated Vehicles
Sponsor: Korea Automobile Testing and Research Institute
Award/Duration: $161,972 / 1.5 Yrs.
Date: 6/5/17

PI: M. "Philart" Jeon, HCC, CLS
Title: NRI: Music-Based Interactive Robotic Orchestration for Children with ASD
Sponsor: The George Washington University/U.S. Dept. of Health and Human Services
Award/Duration: $150,993 / 2.5 Yrs.
Date: 7/28/16

PI: M. "Philart" Jeon, HCC, CLS
Title: ThinkTank: Doctoral Consortium at ICAD 2018
Sponsor: Nat'l Science Foundation
Award/Duration: $20,000 / 1 Yr.
Date: 4/12/18

PI: Jean Mayo, CyberS, CS
Co-PI: Ching-Kuang Shene, CS
Title: EDU: Collaborative: VACCS-Visualization and Analysis for C Code Security
Sponsor: Nat'l Science Foundation
Award/Duration: $130,001 / 3 Yrs.
Date: 9/8/15

Of all active awards, **5** were submitted by PIs in Cognitive and Learning Sciences (**CLS**); **8** by Computer Science (**CS**); **12** by Electrical and Computer Engineering (**ECE**), **2** by Mechanical Engineering-Engineering Mechanics (**ME-EM**), and **2** by the School of Technology (**SoT**).
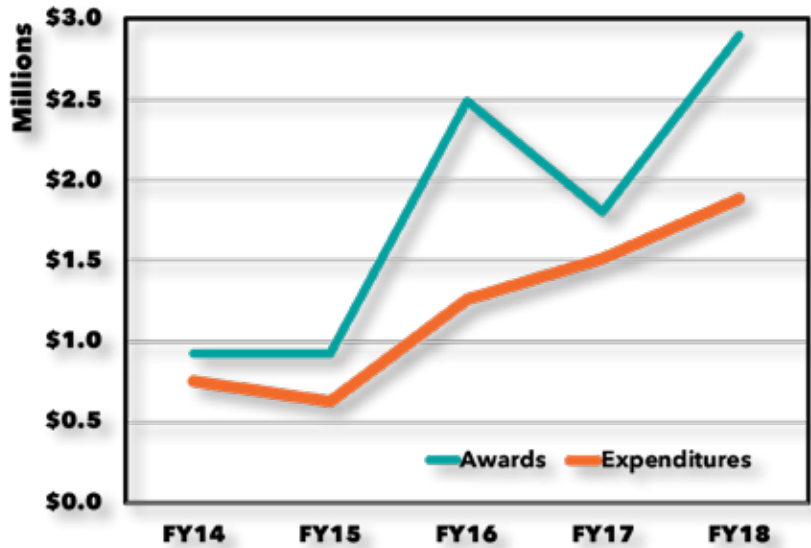
Active

PI: Shane T. Mueller, HCC, CLS
Title: DARPA XAI
Sponsor: Florida Institute for Human and Machine Cognition/U.S. Dept. of Defense
Award/Duration: $147,727 / 4 Yrs.
Date: 6/16/17

PI: Saeid Nooshabadi, SAS, ECE
Title: Collaborative Research: ACI-CDS&E: Highly Parallel Algorithms and Architectures for Convex Optimization for Realtime Embedded Systems (CORES)
Sponsor: Nat'l Science Foundation
Award/Duration: $349,988 / 3 Yrs.
Date: 8/24/17

PI: Soner Önder, SAS, CS
Title: FoMR: Collaborative Research: Dependent ILP: Dynamic Hoisting and Eager Scheduling of Dependent Instructions
Sponsor: Nat'l Science Foundation
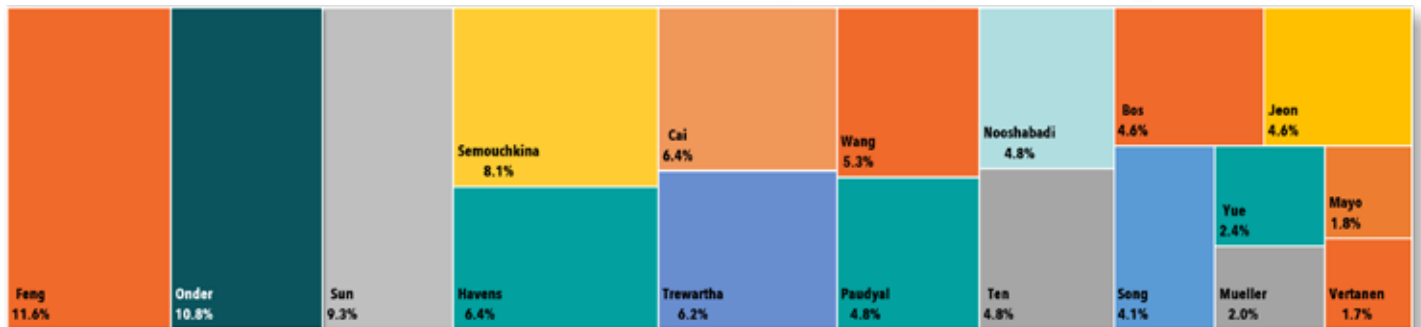**Award/Duration:** $214,868 / 3 Yrs.
Date: 8/22/18

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Awards and Expenditures – FY14 - FY18

	FY14	FY15	FY16	FY17	FY18
Awards	$924,453	$922,934	$2,493,459	$1,798,494	$2,897,637
Expenditures	$755,980	$626,707	$1,257,693	$1,508,400	$1,879,387

Active Grants and Contracts by Principal Investigator

Active

Active Grants and Contracts

Cyber-Physical Systems (**CPS**) Center awards total **$2.28M**; Cybersecurity (**CyberS**), **$600K**; Data Sciences (**DataS**), **$810K**; Human-Centered Computing (**HCC**), **$1.06M**; and Scalable Architectures and Systems (**SAS**), **$2.56M**.

CONTINUED FROM PREVIOUS PAGE

PI: Soner Önder, SAS, CS
Title: XPS: Full: FP:Collaborative Research: Sphinx: Combining Data and Instruction Level Parallelism through Demand Driven Execution of Imperative Programs
Sponsor: Nat'l Science Foundation
Award/Duration: $575,876 / 4 Yrs.
Date: 8/18/16

PI: Sumit Paudyal, CPS, ECE
Title: Packetized Energy Management: Coordinating Transmission and Distribution
Sponsor: University of Vermont/U.S. Dept. of Energy
Award/Duration: $351,339 / 3 Yrs.
Date: 8/29/16

PI: Elena Semouchkina, CPS, ECE
Title: Collaborative Research: IDBR: TYPE A: Unconventional Antenna Probes for Ultra-High Resolution Magnetic Resonance Imaging
Sponsor: Nat'l Science Foundation
Award/Duration: $257,412 / 4 Yrs.
Date: 8/8/14

PI: Elena Semouchkina, CPS, ECE
Title: Developing Anisotropic Media for Transformation Optics by Using Dielectric Photonic Crystals
Sponsor: Nat'l Science Foundation
Award/Duration: $337,217 / 3 Yrs.
Date: 8/24/17

PI: Min Song, CPS, CS
Co-PI: Zhaohui Wang, CPS, ECE
Title: EAGER: NeTS: Under-Ice Mobile Networking: Exploratory Study of Network Cognition and Mobility Control
Sponsor: Nat'l Science Foundation
Award/Duration: $299,716 / 3 Yrs.
Date: 8/17/15

PI: Ye Sun, CPS, ME-EM
Title: CAREER: System-on-Cloth: A Cloud Manufacturing Framework for Embroidered Wearable Electronics
Sponsor: Nat'l Science Foundation
Award/Duration: $350,000 / 5 Yrs.
Date: 5/17/18

PI: Ye Sun, CPS, ME-EM
Co-PI: Shiyan Hu, CS
Title: Understanding and Mitigating Triboelectric Artifacts in Wearable Electronics by Synergic Approaches
Sponsor: Nat'l Science Foundation
Award/Duration: $330,504 / 3 Yrs.
Date: 6/15/17

PI: Chee-Wooi Ten, CPS, ECE
Co-PI: Yeonwoo Rho, Math
Title: CPS: Medium: Collaborative Research: An Actuarial Framework of Cyber Risk Management for Power Grids
Sponsor: Nat'l Science Foundation
Award/Duration: $348,866 / 3 Yrs.
Date: 8/30/17

PI: Kevin M. Trewartha, HCC, CLS
Co-PI: Shane T. Mueller, HCC, CLS
Title: Motor Learning as a Sensitive Behavioral Marker of Mild Cognitive Impairment and Early Alzheimer's Disease
Sponsor: U.S. Dept. of Health & Human Services / NIH
Award/Duration: $455,884 / 3 Yrs.
Date: 6/25/18

PI: Keith D. Vertanen, HCC, CS
Title: CAREER: Technology Assisted Conversations
Sponsor: Nat'l Science Foundation
**Award/Duration:** $96,108 / 5 Yrs.
Date: 3/23/18

ICC Retreat, April 2018

Active

PI: Keith D. Vertanen, HCC, CS
Title: REF-RS: Automatic Speech Recognition using Deep Neural Networks
Sponsor: Michigan Tech
**Award/Duration:** $31,268 / 1 Yr.
Date: 6/1/18

PI: Zhenlin Wang, SAS, CS
Title: CSR: Small: Effective Sampling-Based Miss Ratio Curves: Theory and Practice
Sponsor: Nat'l Science Foundation
Award/Duration: $390,876 / 3 Yrs.
Date: 8/8/16

PI: Jianhui Yue, SAS, CS
Title: SHF: SMALL: Collaborative Research: Improving Reliability of In-Memory Storage
Sponsor: Nat'l Science Foundation
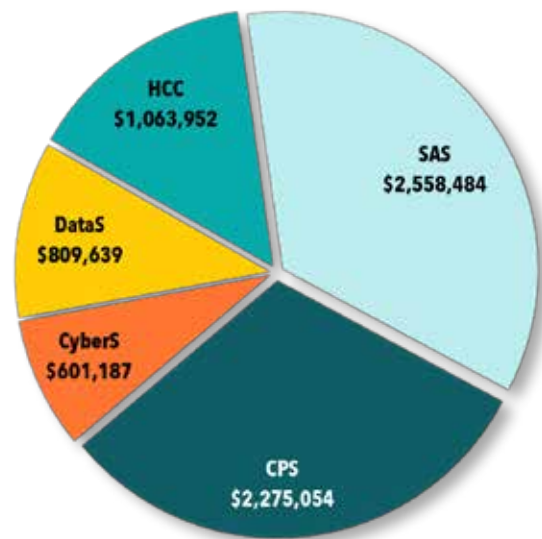**Award/Duration:** $176,876 / 2 Yrs.
Date: 7/14/17

Active Grants and Contracts by School/Department
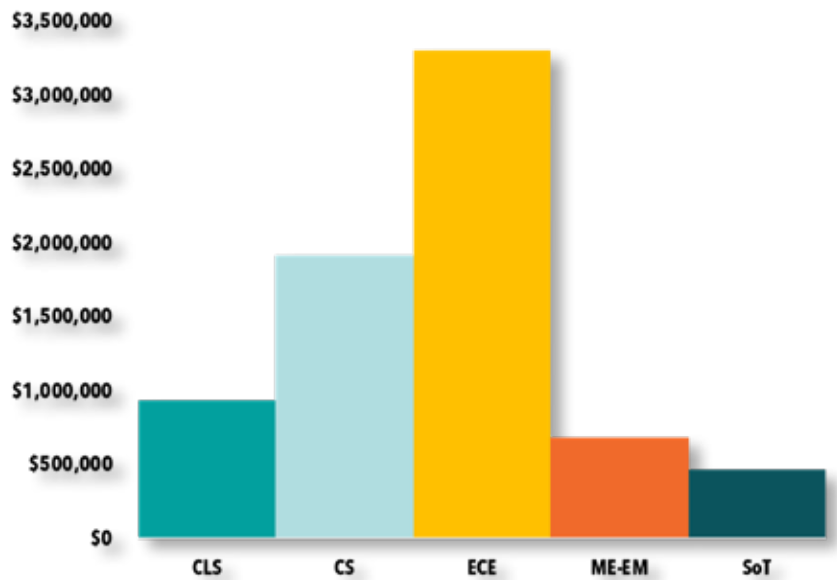
Active Grants and Contracts by Sponsor
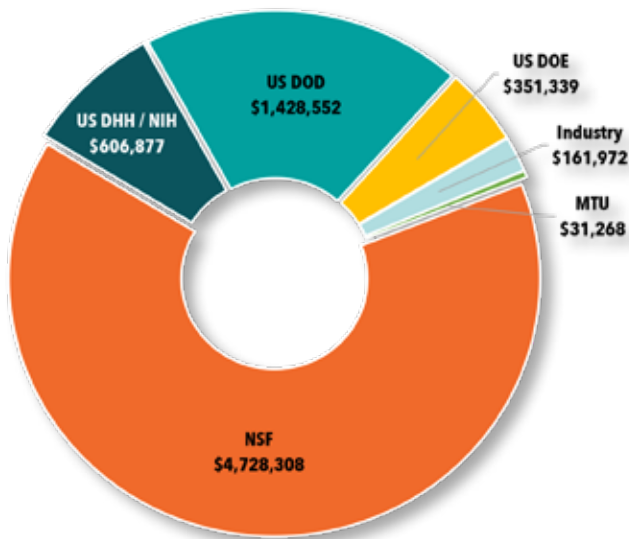
Active Grants and Contracts by ICC Center

Proposals

Research Proposals

ICC pending research proposals number **21**: **9** PIs are in Electrical and Computer Engineering; **5** in Computer Science; **4** in School of Technology; **2** in Cognitive and Learning Services, and **1** in Mechanical Enginering-Engineering Mechanics.

PI: Jeremy P. Bos, DataS
Dept: Electrical and Computer Engineering
Title: STTR:SMET Tele-Operator Feedback Systems
Sponsor: GS Engineering/U.S. DOD
Award Req. / Duration: $45,019 / 1 Year

PI: Yu Cai, Cyber S
Dept: School of Technology
Title: CASE: A Cybersecurity Learning Framework with Case Analysis in Security Education
Sponsor: National Science Foundation
Award Req. / Duration: $299,480 / 2 Yrs.

PI: Yu Cai, Cyber S
Dept: School of Technology
Title: Innovative GenCyber Learning Experience for K-12 Teachers Through Storytelling+Teaching+Gaming+Doing
Sponsor: U.S. DOD
Award Req. / Duration: $91,320 / 1 Year

PI: Yu Cai, Cyber S
Dept: School of Technology
Title: Innovative GenCyber Learning Experience for High School Students Through Storytelling+Teaching+Gaming+Doing
Sponsor: U.S. Dept. of Defense
Award Req. / Duration: $85,841 / 1 Year

PI: Ali Ebnenasir, SAS
Dept: Computer Science
Title: SHF: Small: Property Localization: An Abstraction Method for Efficient Repair, Synthesis and Composition of Distributed Fault-Tolerant Protocols
Sponsor: National Science Foundation
Award Req. / Duration: $498,253 / 3 Yrs.

PI: Zhuo Feng, SAS
Dept: Electrical and Computer Engineering
Title: SHF: Small: Spectral Reduction of Large Graphs and Circuit Networks
Sponsor: National Science Foundation
Award Req. / Duration: $500,000 / 3 Yrs.

PI: Daniel R. Fuhrmann, SAS
Dept: Electrical and Computer Engineering
Title: Trailer Angle Detection using Multiple Automotive Radars
Sponsor: Ford Motor Co.
Award Req. / Duration: $202,567 / 2 Yrs.

PI: Timothy C. Havens, DataS
Dept: Electrical and Computer Engineering
Title: Look-Down Infrared Target Exploitation
Sponsor: ThermoAnalytics Inc. / U.S. DOD
Award Req. / Duration: $30,000 / 1.5 Yrs.

PI: Timothy C. Havens, DataS
Dept: Electrical and Computer Engineering
Title: Efficient CFD Enabled by Deep Learning
Sponsor: ThermoAnalytics Inc. / U.S. DOD
Award Req. / Duration: $300,000 / 2 Yrs.

PI: Timothy C. Havens, DataS
Dept: Electrical and Computer Engineering
Title: NPT-03/04: Localization, Tracking, and Classification of On-Ice Underwater Noise Sources using Machine Learning
Sponsor: U.S. DOD
Award Req. / Duration: $299,533 / 3 Yrs.

PI: Guy C. Hembroff, Cyber S
Dept: School of Technology
Title: Improving Behavioral Health Patient Engagement Access and Care Management in Rural Michigan Through the Use of an Integrated Personal Health Library Model and mHealth to Promote Self Management and Coordinated Care
Sponsor: Mich. Health Endowment Fund
Award Req. / Duration: $486,717 / 2 Yrs.

PI: Soner Önder, SAS
Dept: Computer Science
Title: SHF: Medium: Collaborative Research: Statically Controlled Asynchronous Lane Execution (SCALE)
Sponsor: National Science Foundation
Award Req. / Duration: $599,544 / 3 Yrs.

21 Pending Proposals $10.1M

ICC OBJECTIVE 3: CREATE A PLATFORM FOR BROAD SETS OF NATIONAL AND INTERNATIONAL COLLABORATIONS TO MAKE VALUABLE CONTRIBUTIONS TO THE FIELD.

ICC OBJECTIVE 4: PROMOTE THE EXTERNAL VISIBILITY OF THE ALLIANCE FOR COMPUTING, INFORMATION, AND AUTOMATION (ACIA).

PI: Soner Önder, SAS
Dept: Computer Science
Title: SHF: Small: Collaborative Research: Applying Branch and Control Dependence Elimination (Alpha)
Sponsor: National Science Foundation
Award Req. / Duration: $249,488 / 3 Yrs.

PI: Sumit Paudyal, CPS
Dept: Electrical and Computer Engineering
Title: Resilient Distribution Grids (ResiGrids): An Open-source Multi-timescale Planning and Operational Framework
Sponsor: U.S. Dept. of Energy
Award Req. / Duration: $1,901,770 / 3 Yrs.

PI: Ye Sun, CPS
Dept: ME-EM
Title: Situational Awareness Monitoring in Underground Mines
Sponsor: University of Michigan-Michigan Space Grant Consortium / NASA
Award Req. / Duration: $5,000 / 1 Year

PI: Kevin M. Trewartha, HCC
Dept: Cognitive and Learning Sciences
Title: Motor Learning as a Sensitive Behavioral Marker of Mild Cognitive Impairment and Early Alzheimer's Disease
Sponsor: U.S. DHHS
Award Req. / Duration: $466,373 / 3 Yrs.

PI: Elizabeth S. Veinott, HCC
Dept: Cognitive and Learning Sciences
Title: Exploring Word Games for Learning Science Concepts
Sponsor: U.S. DOE
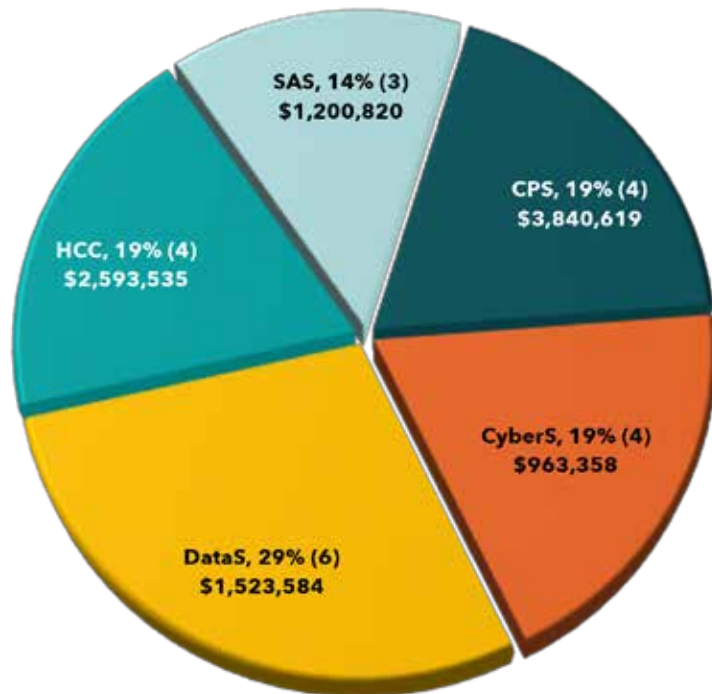**Award Req. / Duration:** $1,351,664 / 4 Yrs.

PI: Keith D. Vertanen, HCC
Dept: Computer Science
Title: CHS: Small: Rich Surface Interaction for Augmented Environments
Sponsor: National Science Foundation
Award Req. / Duration: $499,552 / 3 Yrs.

PI: Keith D. Vertanen, HCC
Dept: Computer Science
Title: CHS: Small: Collaborative Research: Improving Mobile Device Input for Users who are Blind or Low Vision
Sponsor: National Science Foundation
Award Req. / Duration: $275,946 / 3 Yrs.

PI: Seyed A. Zekavat, CPS
Dept: Electrical and Computer Engineering
Title: Mobile Multiband Power Beaming
Sponsor: University of MD / U.S. DOD
Award Req. / Duration: $237,133 / 2 Yrs.

PI: Seyed A. Zekavat, CPS
Dept: Electrical and Computer Engineering
Title: RF-Based UXO, Tunnel, and Contaminated Soil Detection
Sponsor: U.S. Dept. of Defense
Award Req. / Duration: $1,696,716 / 3 Yrs.

Pending Proposals by Center

SAS, 14% (3) $1,200,820
CPS, 19% (4) $3,840,619
CyberS, 19% (4) $963,358
DataS, 29% (6) $1,523,584
HCC, 19% (4) $2,593,535

Center for Cyber-Physical Systems

CPS

RESEARCH AREAS
- **CYBER-PHYSICAL SYSTEMS**
- **INTERNET-OF-THINGS**
- **SMART HOME, BUILDING, COMMUNITY AND GRID**
- **SMART TRANSPORTATION**
- **SMART HEALTH**
- **UNDERWATER COMMUNICATIONS AND NETWORKS**

ACADEMIC AWARDS

Sumit Paudyal
Promoted to Assoc. Professor, June 2018.

Nina Mahmoudian
Named the first Lou and Herbert Wacker Assoc. Professor in Autonomous Mobile Systems, February 2018.

Ye (Sarah) Sun
Recognized at Michigan Tech's annual Research Development Day, Jan. 11, 2018, for having received her first external funding as a principal investigator at Michigan Tech.

Zhaohui Wang
ICC 2018 Achievement Award for her contributions in underwater wireless communications and networking.

TECHNICAL COMMITTEES

Ye (Sarah) Sun
IEEE Engineering in Medicine and Biology (EMB) Society Wearable Biomedical Sensors and Systems Technical Committee.

Sumit Paudyal
Smart Buildings, Loads and Customer Systems (SBLCS) Technical Committee, IEEE PES, 2016-2018.

Jinshan Tang
Co-Chair, IEEE SMC Technical Committee on Information Assurance and Intelligent Multimedia-Mobile Communications, 2016-present.

Kuilin Zhang
Transportation Research Board ADB30 Transportation Network Modeling Committee, 2012-2021.

Transportation Research Board AT015 Committee Freight Transportation Planning and Logistics Committee, 2013-2019.

UNIVERSITY SERVICE

Bo Chen
Computing and Information Sciences (CIS) Advisory Group, 2017-2018.

ME-EM Graduate Committee, 2008-present.

Zhen Liu
Participant, Orientation, Center for Science and Environmental Outreach, 2016-present.

Nina Mahmoudian
Research Advisory Council, COE, 2015-present.

Search Committee for DDS Area, 2015-present.

Advisor, The Iranian Community at Michigan Tech, 2013-present.

Scientist Client, Helped Dr. Robert Pastel develop Human-Computer Interactions and Usability course, 2017-2018.

PROFESSIONAL SERVICE

Zhen Liu
Foundation and Structure Committee, American Society of Civil Engineers, Cold Regions Engineering Division, 2017-present.

Frozen Ground Committee, American Society of Civil Engineers, Cold Regions Engineering Division, 2017-present.

Bituminous Material Committee, American Society of Civil Engineers, 2014-present.

Seasonal Climatic Effects on Transportation Infrastructure Committee, AFP50, Transportation Research Board, 2013-present.

Engineering Geology and Site Characterization Committee, American Society of Civil Engineers, Geo-Institute, 2011-present.

Unsaturated Soils Committee, American Society of Civil Engineers, Geo-Institute, 2011-present.

Committee on Physicochemical and Biological Processes in Soils, AFP40, Transportation Research Board, 2009-present.

Ye (Sarah) Sun
Rapid Session Chair, IEEE Body Sensor Networks (BSN) Conf. 2018, Mar. 4-7, 2018, Las Vegas, NV.

Registration Chair, Poster Track Organizer, IEEE/ACM Conf. on Connected Health: Applications, Systems and Engineering Technologies, July 17-19, 2017, Philadelphia, PA.

Jinshan Tang

Program Committee, 8th Int'l Conf. on Imaging for Crime Detection and Prevention (ICDP), Dec. 13-15, 2017, Madrid, Spain.

Organizing Committee, 24th Int'l Conf. on Mechatronics and Machine Vision in Practice (M2VIP), Nov. 21-23, 2017.

Organizing Committee, 17th IEEE Int'l Conf. on Communication Technology, Oct. 27-30, 2017, Chengdu, China.

Organizing Committee, 8th Int'l Conf. of Pattern Recognition Systems, July 12-13, 2017, Madrid, Spain.

Chee-Woo Ten

Grant Proposal Reviewer, New Zealand Ministry of Science and Innovation, 2012-present.

Zhaohui Wang

Co-Chair, Signal Processing for Communications Symposium, Int'l Conf. on Computing, Networking and Communications (ICNC), Mar. 5-8, 2018, Maui, HI.

Technical Program Committee, ACM Int'l Conf. on Underwater Networks (WUWNet), Nov. 6-8, 2017, Halifax, Canada.

Kuilin Zhang

Grant Proposal Reviewer: New Researchers Start-up Program of Fonds de recherché du Quebec – Nature et technologies, Quebec Government, Canada, 2013-present.

Presenter, MDOT Intern Tour, Aug. 10, 2017.

Host Committee, Int'l Symposium on Transportation and Traffic Theory (ISTTT), July 24-26, 2017, Chicago, IL.

EDITORIAL BOARDS

Bo Chen

Journal Editor: *IEEE Transactions on Intelligent Transportation Systems; IEEE Transactions on Intelligent Transportation Systems.*

Journal Reviewer: *Transactions on Intelligent Transportation Systems.*

Zhen Liu

Journal Editor: *Journal of Cold Regions Engineering.*

Journal Reviewer: *Carbon; Journal of Cold Regions Engineering; Sustainable Civil Engineering; Computer and Geotechnics.*

Sumit Paudyal

Conf. Paper Reviewer: 2017 North American Power Symposium; 2017 IEEE PES General Meeting.

Journal Reviewer: *Energies Journal; Electric Power Systems Research; IEEE Transactions in Smart Grid; IEEE Transactions on Industrial Informatics; IEEE Transactions on Power Delivery; IEEE Transactions on Power Systems; IEEE Transactions on Sustainable Energy.*

Jinshan Tang

Journal Editor: *Journal of Healthcare Engineering.*

Guest Editor: Pattern Recognition.

Journal Reviewer: IEEE Access; ACM Journal on Computing and Cultural Heritage; IEEE Journal of Biomedical and Health Informatics; BMC Cancer.

Conf. Paper Reviewer: 2018 IEEE Int'l Conf. on Image Processing; 2018 IEEE Int'l Conf. on Acoustics, Speech, and Signal Processing.

Zhaohui Wang

Journal Reviewer: Chinese Journal of Acoustics; IEEE Transactions on Mobile Computing; IEEE Transactions on Communications; IEEE Communications Magazine.

MEDIA INTEREST

Elena Semouchkina's research was featured in a Michigan Tech News article, "Beyond Good Vibrations: New Insights into Metamaterial Magic." (Nov. 6, 2017)

Sumit Paudyal's research was featured in the Michigan Tech News article, "Sumit Paudyal Wins CAREER Award." (Feb. 14, 2018)

Chee-Woo Ten is quoted extensively in "Virtual Case Notes: Are Power Grids Prepared to Withstand Cyber Threats?" published Sept. 5, 2017, in forensicmag.com.

Nina Mahmoudian was quoted in the Michigan Tech News article, "Crazy Smart Summer: Girls Build Robots To Help People." (July 18, 2017)

A number of news outlets, including Phys.org, Energy Daily, Innovations Report, Technology Networks, IEEE Electronics360, Azomaterials, Before It's News, EIN News, Scienmag, Phys, Electronic Component News Online, R&D Magazine, Nanowerk, and BrightSurf. com, reported on the metamaterials research recently published by Elena Semouchkina. (Nov. 10, 2017)

Elena Semouchkina's research was featured in a Michigan Tech News article, "Beyond Good Vibrations: New Insights into Metamaterial Magic." (Nov. 6, 2017)

Leo Liu is quoted in the Daily Mining Gazette article of Aug. 31, 2018, "Breathing Pavement: Surface offers flood protection."

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Reza Zekavat

Journal Editor: Int'l Journal of Wireless Information Networks; IET Wireless Sensor Systems; IEEE Transactions on Vehicular Technology.

Kuilin Zhang

Journal Editor: Transportation Research Part E: Logistics and Transportation Review.

Journal Reviewer: Computer-Aided Civil and Infrastructure Engineering; Transportation Research Part B: Methodological; Transportation Science.

Conf. Paper Reviewer: 2017 Int'l Symposium on Transportation and Traffic Theory (ISTTT); Transportation Research Board (2013-present).

INVITED TALKS

Sumit Paudyal

"Optimization Applications in Power Systems," Kadir Has Univ., Turkey, May 2018.

"Recent Advancements in Distribution Optimal Power Flow," South Dakota State University, Brookings, SD, April 2018.

"Recent Advancements in Distribution Optimal Power Flow," Michigan Tech, Dec. 2017.

"Building-to-Grid Control Framework for Grid Services," Univ. of CT, Storrs, CT, Sep. 2017.

Bo Chen

Panelist, Technical Meeting on Electric Vehicles and Charging Stations Cybersecurity, "EV Charging and Charging Network Cybersecurity," U.S. DOE Office of Energy Policy and Systems Analysis, Nov. 29, 2017, Arlington, VA.

Zhen Liu

"Let Atoms Interpret Mechanics: Atomic- and Micro- Scale Simulation for the Theory of Porous Materials," Case Western Reserve Univ., Cleveland, OH, Feb. 2018.

Jinshan Tang

"Investigation of 3-D ultrasound imaging technology and development of 3-D image analysis technology for cattle reproduction application," Seminar, Shanxi Agriculture University, Taigu, Shanxi, China, Oct. 9 2017.

"Detection of Apple Bruise Based on 3D Meshes and Machine Learning Technologies," Seminar, Wuhan University of Science and Technology, Wuhan, China, Sep. 29, 2017.

Kuilin Zhang

"Data-driven model predictive control models for cooperative adaptive cruise control using connected vehicle data," Research Seminar, Department of Civil, Environmental, and Geo- Engineering, University of Minnesota, Minneapolis, MN, Mar. 6, 2018.

"Dynamic Pricing, Heterogeneous Users and Perception Error: Probit-Based Bi-Criterion Dynamic Stochastic User Equilibrium Assignment," Research Seminar, Transportation Center, Northwestern University, Evanston, IL, Jan. 31, 2018.

"Improve observability of dynamic traffic systems using novel mobile sensors," Research Seminar, CS Dept., Michigan Tech, Sep. 29, 2017.

CONFERENCE PRESENTATIONS

Liu, Z., "Deep Learning with Convolutional Neural Network for the Stability Analysis of Geosystems," Machine Learning in Science and Engineering Conf., June 6-8, 2018, Pittsburgh, PA.

Liu, Z., "Heat Transfer in Large-Scale Mine-Water-Geologic-Formation Systems for Geothermal Energy Applications," Great Lakes SedHeat Geothermal Incubator Workshop, National Science Foundation, Case Western Reserve University, Feb. 2018, Cleveland, OH.

Liu, Z., "Development of Prediction Model and Decision Support Tool for Seasonal Load Restrictions in Michigan," Transportation Research Board Annual Conf., Technical Committee AFP50, Jan. 7-11, 2018, Washington, DC.

Liu, Z., "Development of Prediction Model and Decision Support Tool for Seasonal Load Restrictions in Michigan," ASCE Conf. on Technical Advancement (ASCE), Sep. 10-13, 2017, Duluth, MN.

Semouchkina, E., "A Road to Optical Cloaking Using Transformation Media Built from Photonic Crystals," 1st Int'l Conf. on Optics, Photonics, and Lasers (OPAL' 2018), May 9-11, 2018, Barcelona, Spain.

Semouchkina, Elena, "From Microwaves to Optics: All-Dielectric Solutions for Coordinate Transformation-Based Devices," Proc. of Int'l NGC 2017 Symposium: Nano and Giga Challenges in Electronics, Photonics and Renewable Energy, Sep. 18-22, 2017, Tomsk, Russia.

Semouchkina, E., S. Jamilan, G.B. Semouchkin, "A Road to Optical Cloaking Using Transformation Media Built from Photonic Crystals," Proc. of 1st Int'l Conf. on Optics, Photonics, and Lasers (OPAL), May 9-11, 2018, Barcelona, Spain.

Wang, Z., "Experimental Study of Under-Ice Acoustic Communications," Naval Future Force Science and Technology Expo, July 20-21, 2017, Washington, DC.

Zekavat, S. A., "An Introduction to Space Solar Power," IEEE Int'l Conf. on Wireless for Space and Extreme Environments (WISEE), Oct. 10-12, 2017, Montreal Canada.

Zhang, K., "A comprehensive overview of improving traffic flow observability using UAVs as mobile sensors," Transportation Research Board Annual Meeting, Jan. 7, 2018, Washington, D.C.

Zhang, K., S. Zhao, "A data-driven dynamic route choice model under uncertainty using connected vehicle trajectory data," Transportation Research Board Annual Meeting, Jan. 7, 2018, Washington, DC.

Zhang, K., S. Zhao, "A data-driven Model Predictive Control framework for robust Cooperative Adaptive Cruise Control using mobile sensing data," Transportation Research Board Annual Meeting, Jan. 7, 2018, Washington, DC.

BOOKS

Liu, Z., Multiphysics in Porous Materials, Springer, 2018.

Shi, X., Z. Liu, J. Liu, Editors, Proc. of GeoShanghai 2018 Int'l Conf., Transportation Geotechnics and Pavement Engineering, Springer, 2018.

BOOK CHAPTER

Almassalkhi, M, L.D. Espinosa, P.D.H. Hines, J. Frolik, S. Paudyal, M. Amini, "Asynchronous Coordination of Distributed Energy Resources with Packetized Energy Management," *Energy Markets and Responsive Grids,* Springer, 2018.

REPORTS

Brooks, C., R. Dobson, D. Banach, T. Oommen, K. Zhang, A. Mukherjee, T. Havens, T. Ahborn, R. Escobar-Wolf, S. Zhao, Q. Lyu, N. Marion, "Implementation of Unmanned Aerial Vehicles (UAVs) for Assessment of Transportation Infrastructure-Phase II, Final Report," for Michigan Dept. of Transportation, May 2018.

JOURNAL ARTICLES

Almassalkhi, M., L.D. Espinosa, P. Hines, J. Frolik, S. Paudyal, M. Amini, "Asynchronous Coordination of Distributed Energy Resources with Packetized Energy Management," *Energy Markets and Responsive Grids,* June 2018.

Bertozzi, M., B. Chen, P. Zingaretti, "Introduction to the Special Issue on Applications of Mechatronic and Embedded Systems (MESA) in ITS," *IEEE Transactions on Intelligent Transportation Systems,* 19(2), Feb. 2018.

Chen, B., D. Robinette, M. Shahbakhti, K. Zhang, J.D. Naber, J.J. Worm, C.Pinnow, C.J. Morgan, "Connected Vehicles and Powertrain Optimization," *ASME Mechanical Engineering,* 139(9), Sep. 2017.

Gandji, N., G.B. Semouchkin, E. Semouchkina, "All-dielectric metamaterials: irrelevance of negative refraction to overlapped Mie resonances," *Journal of Physics D: Applied Physics,* 50(45), Sep. 2017.

Jafari, M., A.G. Babe, S. Zhao, Ku. Zhang, L.G. Babe, "Electric Vehicle Battery Cycle Aging Evaluation in Real-World Daily Driving and Vehicle-to-Grid Services," *IEEE Transactions on Transportation Electrification,* 4(1), Mar. 2018.

Jamilan, S., G.B. Semouchkin, N. Gandji, E. Semouchkina, "Spatial dispersion of index components required for building invisibility cloak medium from photonic crystals," *Journal of Optics,* 20(4), Mar. 2018.

Jia, D., J. Chao, S. Li, H. Zhang, Y. Yan, T. Liu, Y. Sun, "A Fiber Bragg Grating sensor for radial artery pulse waveform measurement," *IEEE Transactions on Biomedical Engineering,* 65(4), Apr. 2018.

Li, X., Y. Sun, "WearETE: A Scalable Wearable E-Textile Triboelectric Energy Harvesting System for Human Motion Scavenging," *Sensors,* 17(11), Nov. 2017.

Liu, W., D. Jia, Y. Sun, "An Optical Fiber Based Data-Driven Method for Human Skin Temperature 3D Mapping," *IEEE Journal of Biomedical and Health Informatics,* July 2018.

Misra, R., S. Paudyal, O. Ceylan, P. Mandal, "Harmonic Distortion Minimization in Power Grids with Wind and Electric Vehicles," *Energies,* 10(7), July 2017.

Center for Cyber-Physical Systems

CPS

Razmara, M., G. Bharati, D. Hanover, M. Shahbakhti, S. Paudyal, R.D. Robinett, III, "Building-to-grid predictive power flow control for demand response and demand flexibility programs," *Applied Energy,* 203, Oct. 2017.

Razmara, M., G.R. Bharati, M. Shahbakhti, S. Paudyal, R.D. Robinett, "Bilevel optimization framework for smart building-to-grid systems," *IEEE Transactions on Smart Grid,* 9(2), Mar. 2018.

Schneider, K. P., B. Mather, B. C. Pal, C. W. Ten, G. Shirek, H. Zhu, J. Fuller, J. L. R. Pereira, L. Ochoa, L. Araujo, R. Duncan, Stifter, M., S. Paudyal, T. McDermott, B. Kersting, "Analytic considerations and design basis for the IEEE distribution test feeders," *IEEE Transactions on Power Systems,* 33 (3), May 2018.

Tang, J., Z. Hu, P. Zhang, "Identification of Bruised Apples Using a 3-D Multi-order Local Binary Patterns Based Feature Extraction Algorithm," *IEEE Access,* Feb. 2018.

Wang, C., Z. Wang, W. Sun, D.R. Fuhrmann, "Reinforcement learning-based adaptive transmission in time-varying underwater acoustic channels," *IEEE Access,* 6, Dec. 2017.

Wang, J., G.R. Bharati, S. Paudyal, O. Ceylan, B. Bhattarai, "Coordinated Electric Vehicle Charging with Reactive Power Support to Distribution Grids," *IEEE Transactions on Industrial Informatics,* 33(3), May 2018.

Zekavat, S.A., A. Aghdaei, "Novel Low Latency, High Resolution and Low-Cost Time Synchronization," *IET Wireless Sensor Systems,* 7(6), Dec. 2017.

Zhang, C., Z. Liu, Y. Dong, "Effects of adsorptive water on the rupture of nanoscale liquid bridges," *Applied Clay Science,* 146, Sep. 2017.

Zhang, C., Z. Liu, "Freezing of water confined in porous materials: Role of adsorption and unfreezable threshold," *Acta Geotechnica,* 13(5), Feb. 2018.

Zhang, C., Z. Liu, P. Deng, "Using molecular dynamics to unravel phase composition behavior of nano-size pores in frozen soils: Does young-Laplace equation apply in low temperature range?" *Canadian Geotechnical Journal,* 55(8), Jan. 2018.

Zhao, S., K. Zhang, "Observing individual dynamic choices of activity chains from location-based crowdsourced data," *Transportation Research Part C: Emerging Technologies,* 85, Dec. 2017.

CONFERENCE PROCEEDINGS

Cao, C., L. Wang, B. Chen, J.D. Harper, T.P. Bohn, D.S. Dobrzynski, K.S. Hardy, "Real-Time Modeling to Enable Hardware-in-the-Loop Simulation of Plug-in Electric Vehicle-Grid Interaction," *Proc. of ASME/IEEE Int'l Conf. on Mechatronic and Embedded Systems and Applications* (MESA), Aug. 6-9, 2017, Cleveland, OH.

Ceylan, O., S. Paudyal, B.P. Bhattarai, K. Myers, "Photovoltaic hosting capacity of feeders with reactive power control and tap changers," *Proc. of IEEE PES Innovative Smart Grid Technologies Conf. Europe* (ISGT-Europe), Sep. 26-29, 2017, Torino, Italy.

Ceylan, O., S. Paudyal, S. Dahal, N.R Karki, "Assessment of harmonic distortion on distribution feeders with electric vehicles and residential PVs," *Proc. of IEEE 7th Int'l Conf. on Power Systems* (ICPS), Dec. 21-23, 2017, Pune, India.

Dahal, S., S. Paudyal, R. Martin, "Impact of lightning strikes on substation grounding systems," *Proc. of Australasian Universities Power Engineering Conf.* (AUPEC), Nov. 27-30, 2017, Auckland, NZ.

Hu, Z., J. Tang, P. Zhang, B. Patlolla, "Identification of bruised apples using deep learning and 3-D near-infrared imaging," *Proc. of Int'l Conf. on Pattern Recognition and Artificial Intelligence* (ICPRAI), May 14-17, 2018, Montreal, Canada.

Huang, H., S. Hu, Y. Sun, "Energy-efficient ECG compression in wearable body sensor network by leveraging empirical mode decomposition," *Proc. of 2018 IEEE EMBS Int'l Conf. on Biomedical and Health Informatics* (BHI), Mar. 4-7, 2018, Las Vegas, NV.

Lyu, Q., K. Zhang, "A best-case Rosenthal Equilibrium based coordination mechanism for n-person online routing games of connected and automated vehicles," *98th Transportation Research Board Annual Meeting,* Jan 7-11, 2018.

Paudyal, S., O. Ceylan, B. Bhattarai, K. Myers, "Optimal coordinated EV charging with reactive power support in constrained distribution grids," *Proc. of IEEE Power and Energy Society General Meeting* (PESGM), July 16-20, 2017, Chicago, IL.

Sun, W., C. Wang, Z. Wang, M. Song, "Estimation of the Under-Ice Acoustic Field in AUV Communication Networks," *Proc. of Int'l Conf. on Underwater Networks and Systems,* Nov. 6-8, 2017, Halifax, Canada.

Tang, J., Z. Wang, L. Lei, "Book title recognition for smart library with deep learning," *Proc. of SPIE Commercial and Scientific Sensing and Imaging Conf.,* Apr. 15-19, 2018, Orlando, FL.

Tural, S., O. Ceylan, S. Paudyal, "Optimal voltage control in distribution feeders with large penetration of wind," *Proc. of 52nd Int'l Universities Power Engineering Conf.* (UPEC), Aug. 28-31, 2017, Crete, Greece.

Wei, L., Y. Tang, Y. Cao, Z. Wang, M. Gerla, "Exploring Simulation of Software-Defined Underwater Wireless Networks," P*roc. of Int'l Conf. on Underwater Networks and Systems,* Nov. 6-8, 2017, Halifax, Canada.

Yellajosula, J.R.A.K, N. Sharma, S. Paudyal, B. Mork, M. Sundararaman, "Hardware Implementation of R-GOOSE for Wide-Area Protection and Coordination," Proc. of IEEE/PES Transmission and Distribution Conf. and Exposition (T&D), Apr. 16-19, 2018, Denver, CO.

Zhao, S., K. Zhang, "A data-driven Model Predictive Control framework for robust Cooperative Adaptive Cruise Control using mobile sensing data," Proc. of 98th Transportation Research Board Annual Meeting, Jan 7-11, 2018, Washington, DC.

Zhao, S., K. Zhang, "A data-driven optimization based model predictive control for real-time Eco approach and departure at signalized intersections under uncertain traffic conditions," Proc. of 98th Transportation Research Board Annual Meeting, Jan 7-11, 2018.

Zhao, S., K. Zhang, "A data-driven dynamic route choice model under uncertainty using connected vehicle trajectory data," Proc. of Transportation Research Board Annual Meeting, Jan 7-11, 2018.

Z., S., K. Zhang, C. Brooks, D.M. Banach, S.T. Aden, "A comprehensive overview of improving traffic flow observability using UAVs as mobile sensors," Proc. of 98th Transportation Research Board Annual Meeting, Jan 7-11, 2018.

Zhaohui Wang, CPS (right) and Jamey Anderson, GLRC

Center for CyberSecurity

RESEARCH AREAS

- **CYBERSECURITY**
- **INFORMATION SECURITY AND BIOMETRICS**
- **PRIVACY PROTECTION**
- **TRUSTED SOFTWARE ENGINEERING**
- **SECURITY IN MOBILE COMPUTING AND WIRELESS COMMUNICATIONS**

MEDIA INTEREST

Michigan Tech's "Tech in 10" Q and A article featured Nina Mahmoudian, who reflected on where mechanical engineering education and research is heading over the next decade. (Apr. 5, 2018)

B. Chen's research was the subject of, "How to Speed Up Bare Metal Malware Analysis and Better Protect Mobile Devices," on Michigan Tech's Unscripted news site. (Mar. 20, 2018)

In a story featured on the official Google blog, Jean Mayo was mentioned as one of 15 nationwide recipients of grant to support computer science research-focused workshops for undergraduate women.

Jeff Wall was selected as one of 11 spring 2018 Dean's Teaching Showcase members by SBE Dean Dean Johnson, as announced in the Feb. 9, 2018, issue of Tech Today.

ACADEMIC AWARDS

Bo Chen

Distinguished Paper Award for "Supporting Transparent Snapshot for Bare-metal Malware Analysis on Mobile Devices," 2017 Annual Computer Security Applications Conf. (ACSAC), Dec. 4-8, 2017, Orlando, FL.

Jeffrey Wall

Finalist, 2018 Distinguished Teaching Awards, Michigan Tech William G. Jackson Center for Teaching and Learning.

EDITORIAL BOARDS

Bo Chen

Journal Reviewer: *MDPI Sensors; IEEE Network Magazine; MDPI Sensors; MDPI Symmetry; IEEE Network Magazine; Codes and Cryptography, Designs; IEEE Communications Magazine; MDPI Symmetry, IEEE Transactions on Information Forensics and Security; MDPI Information.*

Conference Paper Reviewer: 1st Workshop on Distributed Ledger of Things (DLot 2018); 2018 IEEE Symposium Series on Computational Intelligence; 15th IEEE Int'l Conf. on Mobile Ad Hoc and Sensor Systems; 2018 IEEE Conf. on Communications and Network Security; 2018 IEEE Int'l Conf. on Communications; IEEE Symposium Series on Computational Intelligence.

Guy Hembroff

Editor: *Brazilian Journal of Medicine and Human Health.*

Yu Cai

Associate Editor: *Green Computing: Informatics and Systems.*

Editorial Board, *Int'l Journal of Green Computing.*

Journal Reviewer: *IEEE Transactions on Parallel and Distributed Systems; IEEE Transactions on Systems, Man and Cybernetics, Part A; Journal of Parallel and Distributed Computing; Security and Communication Networks Journal (SCN); Journal of Communications and Networks; Int'l Journal of Network Security; Journal of Technology Interface; Mobile Networks and Applications; Wireless Communications and Mobile Computing.*

Jeff Wall

Journal Reviewer: *Information and Management; Decision Sciences; Information Systems Journal; Journal of the Association for Information Systems; Information and Management.*

Conf. Editor: Dewald Roode Workshop.

PROFESSIONAL SERVICE

Yu Cai

Reviewer, NSF Panels, 2006-2018.

Conf. Program Committee: ICC 2018; PIMRC 2018; WASA 2017; WCSP 2017; WCNC 2017; eCrime 2017; IOV 2017.

Conference Reviewer: ICC 2018; PIMRC 2018; WASA 2017; WCSP 2017; WCNC 2017; eCrime 2017; IOV 2017.

Bo Chen

Grant Proposal Reviewer, Univ. of Sharjah, 2018.

Conference Paper Reviewer: IEEE Conf. on Communications and Network Security (CNS), May 30-June 1, 2018, Beijing, China; IEEE Int'l Conf. on Communications (ICC), May 20-24, 2018, Kansas City, MO.

Guy Hembroff

Reviewer, Int'l Conf. on Information Systems Security and Privacy Conf. (ICISSP), 2015-2018.

Portage Health Foundation Committee, 2015-2020.

Board Member, Upper Great Lakes Family Health Center (UGLFHC), 2014-present.

Jeff Wall

Conf. Reviewer: Hawaiian Int'l Conf. of System Sciences; Dewald Roode Workshop; Workshop on Information Security and Privacy.

UNIVERSITY SERVICE

Yu Cai

ABET CAC Evaluator, 2018-present.

Chair, University Senate IT Committee, 2018-present.

Program Coordinator, CAE-CDE Application, 2018-present.

Conflict of Interest Committee, 2017-2019.

Faculty Distinguished Service Award Committee, 2017-2018.

CNSA Faculty Hiring Committee, School of Technology, 2017-2018.

Program Coordinator, ABET Preparation, 2017-2018.

Advisor, Red Team on Cybersecurity, 2016-present.

Chair, Program Coordinator, CNSA Program, 2016-present.

Advisor, Chinese Students and Scholars Association, 2016-2019.

University Climate Study Committee, 2016-2018.

Interschool TPR Committee, 2016-2018.

Curriculum and Course Binder Development Committee, School of Technology, CNSA Curriculum, 2016-2018.

Senator At-Large, 2015-present.

Faculty Mentor, K-12 Outreach, 2015-2019.

STEM Goal 2 Committee, 2015-2019.

Advisor, Int'l Fellowship Association, 2015-2018.

TPR Committee, School of Technology, 2015-2016.

Bo Chen

Faculty Search Committee, CS Dept., 2018-2019.

Reviewer, Summer Undergraduate Research Fellowship program (SURF), Feb. 2018.

Computing and Information Sciences (CIS) Advisory Group, 2017-2018.

Advisor, National Cyber League (NCL), 2017-2018.

Advisor, Reading Group on Cybersecurity, 2017-2018.

Graduate Committee, CS Dept., 2017-2018.

Jean Mayo

Chair, Graduate Assessment Committee, CS Dept., 2017-present.

Information Technology Governance Committee, 2015-present.

ABET Accreditation Committee, CS Dept., 2015-present.

Tenure and Promotion Committee, CS Dept., 2009-present.

Guy Hembroff

Informatics Computing Committee, 2013-present.

Information Science and Computing Curricular Committee, 2013-2017.

Campus Rep., USENIX, 2011-present.

School of Technology Promotion and Tenure Committee, 2010-2019.

Chair, CNSA Program Committee, 2006-present.

INVITED TALKS

Bo Chen

"Deniable Encryption Storage for Mobile Devices," Tech Talks, Oct. 5, 2017.

"Towards Data Protection in Flash-based Solid-State Storage," Univ. of Electronic Science and Technology of China, Sichuan, China, June 2018.

Sichuan Univ., Sichuan, China, June 2018.

Chinese Academy of Sciences, Beijing, China, June 2018.

Univ. of Chinese Academy of Sciences, Beijing, China, June 2018.

Institute of Computing Technology, Chinese Academy of Sciences, Beijing, China, May 2018.

Wuhan Univ., Hubei, China, May 2018.

Guy Hembroff

"A Novel Kinect-based Algorithm for Inferring the Position of the Lower Body Joints Using Human Gait Pattern," Paper Session 7: Software and Algorithms, 6th IEEE Int'l Conf. on Healthcare Informatics (ICHI), New York, NY, June 4-7, 2018.

Center for CyberSecurity

CyberS

Jeff Wall

  Data Science Exec. Committee, 2018-2019.
  MBA Program Committee, SBE, 2016-2018.
  Advisor, Association for Information Systems at Michigan Tech, Student Chapter, 2015-2018.
  Pro Bono Prof. Service, SBE, 2015-2018.

BOOKS

  Chen, Bo, *Solid State Storage: Principle, Architecture and Data Security,* 2017.

BOOK CHAPTERS

Chen, Bo, Reza Curtmola, Jun Dai, "Auditable Version Control Systems in Untrusted Public Clouds," *Software Architectures for Cloud and Big Data,* Elsevier, 353-366, 2017.

Zhong, Chen, John Yen, P. Liu, Rob F Erbacher, Christopher Garneau, B. Chen, "Studying Analysts' Data Triage Operations in Cyber Defense Situational Analysis," *Theory and Models for Cyber Situation Awareness,* Springer, 128-169, 2017.

CONFERENCE ATTENDANCE

Chen, B., IEEE Conf. on Communications and Network Security (IEEE CNS), May 30-June 1, 2018, Beijing, China.

Chen, B., IEEE Symposium on Security and Privacy, May 21-23, 2018, San Francisco, CA.

Hembroff, G., Sixth IEEE Int'l Conf. on Healthcare Informatics (ICHI), June 4-7, 2018, New York, NY.

CONFERENCE PRESENTATIONS

Wall, J., M. Buche, "Integrating Outcome Oriented Policy in Information Security Policies: An Examination of Security Perceptions, Motivations, and Intentions," Dewald Roode Security Workshop on Information Systems Security, Oct. 6-7, 2017, Tampa, FL.

Jia, S., L. Xia, B. Chen, P. Liu, "DEFTL: Implementing Plausibly Deniable Encryption in Flash Translation Layer," ACM Conf. on Computer and Communications Security (CCS), Oct. 30-Nov. 3, 2017, Dallas, TX.

Meng, X., S. Wang, K. Shu, J. Li, B. Chen, H. Liu, Y. Zhang, "Personalized Privacy-Preserving Social Recommendation," 32nd AAAI Conf. on Artificial Intelligence (AAA), Feb. 2-7, 2018, New Orleans, LA.

JOURNAL ARTICLES

Cai, Y., "A Virtual Machine Placement Algorithm with Energy-efficiency in Cloud Computing," *Int'l Journal of Green Computing,* 8(2), 2017.

Cai, Y., M. Schultz, B. Downey, "Alternative Energy Powered Computer Lab and Green Technology on Campus," *The Technology Interface Int'l Journal,* 18(1), 2017.

Chang, B., Y. Cheng, B. Chen, F. Zhang, W.T. Zhu, Y. Li, Z. Wang, "User-Friendly Deniable Storage for Mobile Devices," *Elsevier Computers and Security,* 72, Jan. 2018.

Chen, B., R. Curtmola, "Remote Data Integrity Checking with Server-Side Repair," *Journal of Computer Security,* 25(6), Aug. 2017.

Matos, M. A., I. C. F. Barboza, M. V. A. R. Ferraz, G. Hembroff, "Michigan Hand Outcomes Questionnaire for the Evaluation of Patients with Mucopolysaccharidosis," *Bulletin of the Hospital for Joint Disease,* 76(2), June 2018.

Wall, C. Wagner, P. Lowry, "Proposing the Core Contributor Withdrawal Theory (CCWT) to Understand Core Contributor Withdrawal from Online Peer-Production Communities," *Internet Research,* 28(4), 2018.

Wall, J. D., R. Singh, "The Organization Man and the Innovator: Theoretical archetypes to inform behavioral information security research," *The Data Base for Advances in Information Systems,* 49(S1), Apr. 2018.

Wall, J.D., R. Singh, "Contextualized Meaning Extraction: A Meta-algorithm for Big Data Text Mining with Pragmatics," *Int'l Journal of Organizational and Collective Intelligence,* 7(3), July 2017.

Zhang, Q., S. Jia, B. Chang, B. Chen, "Ensuring Data Confidentiality via Plausibly Deniable Encryption and Secure Deletion - A Survey," *Cybersecurity,* 1(1), 2018.

CONFERENCE PROCEEDINGS

Cai, Y., "Teaching Directory Services: Topics, Challenges, and Experiences," *Proc. of 125th American Society for Engineering Education Conf.* (ASEE), Jun. 24-27, 2018, Salt Lake City, UT.

Cai, Y., T.O. Arney, "Cybersecurity Should be Taught Top-Down and Case-Driven," *Proc. of 18th ACM Conf. on Information Technology Education* (SIGITE), Oct. 4-7, 2017, Rochester, NY.

Chang, B., F. Zhang, B. Chen, Y. Li, W.T. Zhu, Y. Tian, Z. Wang, A. Ching, "MobiCeal: Towards Secure and Practical Plausibly Deniable Encryption on Mobile Devices," P*roc. of the 48th IEEE/IFIP Int'l Conf. on Dependable Systems and Networks* (DSN), June 25-28, 2018, Luxembourg City, Luxembourg.

Guan, L., S. Jia, B. Chen, F. Zhang, B. Luo, J.L., P. Liu, X. Xing, L. Xia, "Supporting Transparent Snapshot for Bare-metal Malware Analysis on Mobile Devices," *Proc. of the 2017 Annual Computer Security Applications Conf.* (ACSAC), Dec. 3-7, 2017, Orlando, FL.

Jia, S., L. Xia, B. Chen, P. Liu, "DEFTL: Implementing Plausibly Deniable Encryption in Flash Translation Layer," *Proc. of the ACM Conf. on Computer and Communications Security* (CCS), Oct. 30-Nov. 3, 2017, Dallas, TX.

Mayo, J., M. Wang, C.-K. Shene, S. Carr, C. Wang, "UNIXvisual: A Visualization Tool for Teaching UNIX Permissions," *Proc. of ACM Conf. on Innovation and Technology in Computer Science Education,* July 3-5, 2017, Bologna, Italy.

Meng, X., S. Wang, K. Shu, J. Li, B. Chen, H. Liu, Y. Zhang, "Personalized Privacy-Preserving Social Recommendation," *Proc. of AAAI Conf. on Artificial Intelligence* (AAAI), Feb. 2-7, 2018, New Orleans, LA.

Miranda, A., S. Goldsmith, "Cyber-Physical Risk Management for a Photovoltaic (PV) Plant," *Proc. of 51st Int'l Carnahan Conf. on Security Technology,* Oct. 23-26, 2017, Madrid, Spain.

Osman, S.E., G. Hembroff, M.A. Matos, 2018, "A Novel Kinect-Based Algorithm for Inferring the Position of the Lower Body Joints Using Human Gait Pattern," *Proc. of the IEEE Int'l Conf. on Healthcare Informatics* (ICHI), June 4-7, 2018, New York, NY.

Subedi, K.P., D.R. Budhathoki, B. Chen, D. Dasgupta, "RDS3: Ransomware Defense Strategy by Using Stealthily Spare Space," *Proc. of IEEE Symposium Series on Computational Intelligence* (SSCI), Nov. 27-Dec. 1, 2017, Honolulu, HI.

Wu, D., Z. Xu, B. Chen, Y. Zhang, "Towards Access Control for Network Coding-based Named Data Networking," *Proc. of IEEE Global Communications Conf.* (GLOBECOM), Dec. 4-8, 2017, Singapore.

Xu, H., F. Xu, B. Chen, "Internet Protocol Cameras with No Password Protection: An Empirical Investigation," Proc. of 2018 Passive and Active Measurement Conf. (PAM), Mar. 26-27, 2018, Berlin, Germany.

Xu, Z., B. Chen, X. Meng, L. Liu, "Towards Efficient Detection of Sybil Attacks in Location-based Social Networks," Proc. of IEEE Symposium Series on Computational Intelligence (SSCI), Nov. 27-Dec. 1, 2017, Honolulu, HI.

Winter Carnival

Center for Data Sciences

DataS

RESEARCH AREAS
- **DATA SCIENCES**
- **BIG DATA AND DATA-INTENSIVE COMPUTING**
- **ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING**
- **PATTERN RECOGNITION**
- **SIGNAL AND IMAGE PROCESSING**
- **SENSOR AND DATA FUSION**

TECHNICAL COMMITTEES

Timothy Havens

IEEE Computational Intelligence Society Fuzzy Syst. Technical Comm., 2018-present.

IEEE Computational Intelligence Society Task Force on Cybersecurity for Smart World, 2017-present.

IEEE SSCI Technical Committee, 2017.

Thomas Oommen

AFS20: Committee on Geotechnical Instrumentation and Modeling, The National Academies of Sciences Engineering Medicine, Transportation Research Board, 2018-present.

Co-Chair, Seismic Hazards Technical Working Group, Association of Environmental and Engineering Geologists (AEG), 2013-present.

Officer, Secretary, Engineering Geology and Site Characterization Committee, ASCE Geo-Institute, (EG&SC), 2013-present.

Communications Committee, Association of Environmental and Engineering Geologists (AEG), 2013-present.

Landslide Technical Working Group, Association of Environmental and Engineering Geologists (AEG), 2013-present.

EDITORIAL BOARDS

Jeremy Bos

Assoc. Editor: *Applied Optics.*

Reviewer: *Optical Engineering; IEEE Transactions on Image Processing; Optics Communications; Applied Optics; Journal of the Optical Society of America A; Optics Express; Optics Letters.*

Conf. Paper Reviewer: 2017 IEEE Aerospace Conf.

Laura Brown

Co-editor: *AI Magazine*.

Mari Buche

Editorial Board, Editor: *Journal of Midwest AIS; Journal of Information Technology Management; Journal of E-Working.*

Timothy Havens

Associate Editor: *IEEE Transactions on Fuzzy Systems.*

Nilufer Önder

Reviewer: *AAAI Conf. on Artificial Intelligence; AI Magazine; Artificial Intelligence Journal; Computational Intelligence; Decision Sciences Institute; Grace Hopper Conf. Travel Scholarships; Int'l Joint Conf. on Artificial Intelligence;*

Int'l Journal of Artificial Intelligence Tools; Journal of Automation in Construction; Journal of Autonomous Agents and Multi-Agent Systems; NSF; SES-IOS; Innovation and Organizational Sciences; NSP Review Panel, Women in Engineering Proactive Network.

Benjamin Ong

Reviewer: *National Science Foundation; AMS MathScinet; Journal of Computational Physics; Mathematical Reviews; SIAM Journal on Scientific Computing (SISC); Recent Advances in Electrical and Electronic Engineering; Communications in Applied and Computational Science; Computing and Visualization in Science; AMS; JCP; SISC; CamCOS.*

Thomas Oommen

Editorial Board: *Geomatics; Environmental and Engineering Geoscience.*

Journal Assoc. Editor: *ASCE Journal of Materials in Civil Engineering; AIMS Geoscience; Int'l Journal of Geotechnical Earthquake Engineering.*

Journal Reviewer: *Bulletin of the Seismological Society of America; Journal of Environmental Quality; Journal of Hydroinformatics; Neural Computing and Applications Journal; Neurocomputing.*

Michael Roggemann

Editor: *Applied Optics.*

Mark Rouleau

Reviewer: *Environmental Management; Landscape and Urban Planning; Energies.*

PROFESSIONAL SERVICE

Jeremy Bos

Chair, SPIE Scholarship Committee, 2013-present.

Grant Proposal Reviewer: Air Force Office of Scientific Research, Aug. 2017.

Laura Brown

Organizing Committee, Symposium on Educational Advances in Artificial Intelligence (EAAI), 2012-2019.

Tim Havens

IEEE Computational Intelligence Society Social Media Committee, 2015-present.

IEEE Trans. Fuzzy Systems Outstanding Paper Committee, 2018.

IEEE Trans. Fuzzy Systems Outstanding Paper Committee, 2018.

General Chair, FUZZ-IEEE Conf., 2017-2019.

Nilufer Önder

Science Olympiad Coach, Washington Middle School and Calumet High School, 2005-present.

Benjamin Ong

NSF Panels, 2017, 2018, 2019.

Co-organizer, Kliakhandler Conf. on Bayesian Inference in Statistics and Statistical Genetics, July 2017-present.

Thomas Oommen

Co-chair, Technical Session, Association of Environmental and Engineering Geologist Conf. (AEG), Sep. 12-16, 2017, Colorado Springs, CO.

Grant Proposal Reviewer, National Science Foundation: Int'l Research Experience for Students, 2018-present.

Grant Proposal Reviewer, National Science Foundation: Smart and Connected Communities, 2017-present.

UNIVERSITY SERVICE

Jeremy Bos

Undergraduate Program Committee, ECE Dept., 2015-present.

Advisor, GM/SAE AutoDrive Challenge Team, 2017-present.

Advisor, Robotics System Enterprise, 2017-present.

Laura Brown

Presenter, Summer Youth Program Women in Computer Sciences Week.

Advisor, Computer Science student events.

Co-advisor, Michigan Tech Women in Computer Sciences (WiCS).

Alternate, University Senate, 2016-present.

ADVANCE Matrix Process for University Programs (AMP-UP, 2015-present.

CS External Relations Committee, 2014-present.

Mari Buche

Chair , MBA Program Committee.

SBE Strategic Planning Committee.

Program Coordinator, SBE Data Science Council.

Data and Safety Monitoring Board, 2018-present.

Facilitator, Goal Development Workshop, VP for Admin., Advance, 2017.

Faculty Rep., Benefits Liaison Group, 2015-2018.

Data Science Executive Board, 2014-2018.

Advisory Council, Student Veteran's Group, 2013-present.

University Marshal, 2010-2018.

Faculty Advisor, Rotaract Student Organization, 2017-2018.

DataS SPONSORSHIPS

2018 MTU AutoDrive Challenge Team, led by DataS member Jeremy Bos, which allowed the team to purchase and mount cameras on their self-driving car.

41 North Film Festival showing of AlphaGo, Nov. 3, 2017. ICC members Tim Havens, Laura Brown, S. Goldsmith participated in a panel discussion following the film.

ACADEMIC AWARDS

Jeremy Bos and M. Buche were recognized at Michigan Tech's annual Research Development Day, Jan. 11, 2018, for having received their first external funding as principal investigators at Michigan Tech.

Benjamin Ong

Outstanding Research Award, Michigan Tech Dept. of Mathematical Sciences, July 2017.

Thomas Oommen

First GIAN Fellow of the Dept. of Geology, Univ. of Kerala, India, 2018.
First Erudite Scholar of the Dept. of Geology, Univ. of Kerala, India, 2017.

MEDIA INTEREST

Jeremy Bos

TV6 AutoDrive Story, Apr. 6, 2018.
Paulding Lights-Mysteries at the Museum, Travel Channel, Nov. 17, 2017.
Filming of Paulding Light Project, WAG TV, July 10, 2017.
Paulding Lights filming on location, Science or Discovery Channel, to be aired on proposed series at a future time.
Story on Paulding Lights, ABC 10, July 10, 2017.

Center for Data Sciences

CONT'D FROM PREVIOUS PAGE

Timothy Havens

REF Reviewer, Office of Research, Apr. 2018.

CIS Working Group, 2017-2018.

Chair, Data Science Committee, 2017-2018.

Promotion and Tenure Committee, CS Dept., 2017-2018

Reviewer, REF SEED, 2017.

Research Computing Committee, 2015-present.

Data Sciences Executive Committee, 2014-present.

Communication Committee, CS Dept., 2013-2018.

Nilufer Önder

Advisor, Upsilon Pi Epsilon CS Honor Society, 2006-present.

Advisor, Women in Computing Sciences (WiCS) Student Group, 2004-present.

Co-director, Women in Science and Engineering (WISE) Faculty Group, 2010-present.

Co-Chair, PhD Qualifiers on Theory of Computation Committee, CS Dept., 2008-present.

Tenure, Promotion, and Reappointment Committee, CS Dept., 2008-present.

External Relations and Publicity Committee, CS Dept., 2015-present.

Tenure, Promotion, and Reappointment Committee, CS Dept., 2006-present.

Founding Advisor, Turkish Student Association, 2012-present.

Founding Advisor, ACM Student Chapter, 2013-present.

Presenter, Summer Youth Program, 2010-present.

Univ. Academic Integrity Assessment Committee, 2015-present.

Benjamin Ong

Graduate Program Director, Data Science.

Faculty Mentor, Enterprise, IT Oxygen.

Research Computing Committee.

DRS Taskforce.

Program Coordinator, Data Science, 2018-present.

Faculty Mentor, Enterprise, IT Oxygen, 2018-present.

Judge, Design Expo, April 2018.

Judge, Undergraduate Research Symposium, March 2018.

CIS Working Group, 2017-present.

Hiring Committee, Math Dept., 2017-2018.

Organizer, Applied Math Seminar, 2016-2018.

Research Computing Comm., 2015 -present.

Data Science Exec. Committee, 2015-2017.

Undergraduate Committee, Math Dept., 2015-2017.

Thomas Oommen

Executive Committee, Michigan Tech Transportation Institute, 2017-present.

College of Engineering Dean Search Committee, 2017-2018.

Chair, Promotion and Tenure Committee Chair, GMES Dept., 2017-18.

Chair, Geological Engineering Curriculum Committee, 2010-present.

Chair, Promotion and Tenure Committee, GMES Dept., 2017-18.

Dept. Coordinator, 2017-18 ABET Cycle: One Strength, No Shortcomings.

Michael Roggemann

Advisor, Archery Club, 2014-2020.

Advisor, Pistol Club, 2012-2020.

Mark Rouleau

Advisor, Committee to Organize a School of Computing, May 2018.

Advisor, University Liaison to the Int'l Consortium of Political and Science Research (ICPSR), 2016-present.

Chair, Global Literacy Learning Goal Committee, 2014-present.

Advisor, Social Sciences Graduate Student Society, 2014-present.

Advisor, Big Data Sciences Certificate Proposal Committee, 2013-present.

High Performance Computing Research Committee, 2013-present.

Chair, Social Sciences Dept. Environmental and Energy Policy Web Committee, 2013-present.

Chair, Global Issues Committee, 2012-present.

Social Sciences Dept. Law and Society Assessment Committee, 2012-present.

Social Sciences Dept. Environmental and Energy Policy PhD Proposal Committee, 2010-present.

Hairong Wei

SFRES Computer Comm., 2013-present.

SFRES Int'l Collaboration Committee, 2013-present.

SFRES BRC Distinguished Seminar Committee, 2008-present.

BOOK CHAPTERS

Escobar-Wolf, R., E.H. Bouali, T. Oommen, "Risk Assessment," *Encyclopedia of Engineering Geology,* Springer, 2017.

Oommen, T., "Liquefaction," *Encyclopedia of Engineering Geology*, 2017.

Oommen, T., "Surveying," Encyclopedia of Engineering Geology, 2017.

Rouleau, M.D., "ForestSim: An Agent-Based Simulation for Bioenergy Sustainability Assessment," *Advances in Complex Societal, Environmental and Engineered Systems*, 1 ed., 2017.

Sajinkumar, K.S., T. Oommen, "Photogrammetry," *Encycl. of Engineering Geology,* Springer, 2017.

REPORTS

Oommen, T., R. Coffman, K.S. Sajinkumar, C.L. Vishnu, "Geotechnical impacts of August 2018 floods of Kerala, India," NSF-GEER Report no: 058, 2018.

Oommen, T., R. Escobar-Wolf, R. Shuchman, M. Battaglia, S. Aden, "Transport risk mitigation investment plan for B2B and Salang Pass roads, Afghanistan," Deliverable-World Bank, 2017.

Shuchman, R., T. Oommen, R. Escobar-Wolf, M. Battaglia, S. Aden, "User manual for the Afghanistan transportation geohazard mitigation and investment decision support system," Deliverable-World Bank, 2017.

ABSTRACTS AND CONFERENCE PRESENTATIONS

Addison, P., T. Oommen, "A machine learning approach to burn severity estimation using radar sensors," Meeting of the Association of Environmental and Engineering Geologists, Sep. 10-17, 2017, Colorado Springs, CO.

Anderson, E., N. Bird, C. Lucca, Z. Fleming, J.S. Gierke, T. Oommen, "Slope stability analysis in the vicinity of the Enguri hydroelectric dam, Republic of Georgia," 60th Annual Meeting of the Association of Environmental and Engineering Geologists, Sep. 10-17, 2017, Colorado Springs, CO.

Anderson, E., T. Oommen, P. Addison, "Utilizing a simplified hydrology model to map fire-induced debris flow travel paths," 60th Annual Meeting of the Association of Environmental and Engineering Geologists, Sep. 10-17, 2017, Colorado Springs, CO.

INVITED TALKS

Jeremy Bos

"Robust Terrain Identification and Path Planning for Autonomous Ground Vehicles in Unstructured Environments," Univ. of Michigan Automotive Research Center Seminar Series, U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC), Warren, MI, Apr. 10, 2018.

"Optics and Autonomous Vehicle Research at Michigan Tech," Universidad de Los Andes, Santiago, Chile, 2018.

"Unreal as a platform for design, testing, validation of algorithms for Autonomous Ground Vehicles," NATO Applied Vehicle Technology Panel (AVT-248), Athens, Greece, 2018.

"Imaging theory and mitigation in extreme turbulence-induced anisoplanatism," AFOSR Fall Portfolio Review, Oct. 2017, Arlington, VA.

"Imaging Through Turbulence: A Light-Field Approach," Advanced Maui Optical and Space Surveillance Technologies Conf. (AMOS), Maui, HI, Sep. 22, 2017.

Tim Havens

"How to win on trivia night: sensor fusion beyond the weighted average," at: AFIT Graduate School of Engineering and Management, WPAFB, OH, Nov. 2018; MIT Lincoln Library, Lexington, MA, July 2018; and Copper Country Coders, Houghton, MI, May 2018.

"Sensor fusion and radar signal processing," Argo AI, Pittsburgh, PA, Feb. 2018.

"Sensor-fused Explosive Hazard Detection," U.S. Capitol, "STIx on the Hill, Jan. 2018." STIx—science, technology and information exchange—brings together leading experts in the defense research community to discuss innovative areas for research and development for the Dept. of Defense. Havens' Washington DC travel and research was featured in the Michigan Tech News article, "Michigan Tech Professor Presents Defense Research on the Hill," published Jan. 30, 2018.

Center for Data Sciences

DataS

CONT'D FROM PREVIOUS PAGE

Bouali, E.H., T. Oommen, K.S. Sajinkumar, R. Escobar-Wolf, "Satellite InSAR as an initial health assessment tool for dams and reservoirs," United States Society on Dams Conf. and Exhibition, Apr. 30-May 4, 2018, Miami, FL.

Bouali, E.H., T. Oommen, R. Escobar-Wolf, "Landslide life-cycle monitoring and failure prediction using satellite remote sensing," Eos Trans. AGU, Fall Meet. Suppl., Dec. 11-15, 2017, New Orleans, LA.

Bouali, E.H., T. Oommen, R. Escobar-Wolf, "Monitoring the Casitas Dam in Ventura County, California with satellite InSAR," 60th Annual Meeting of the Association of Environmental and Engineering Geologists, Sep. 10-17, 2017, Colorado Springs, CO.

Bouali, E.H., T. Oommen, R. Escobar-Wolf, "Slow landslide identification using InSAR to update the California landslide inventory on the Palos Verdes Peninsula," GSA Annual Meeting. Oct. 22-25, 2017, Seattle, WA.

Havens, T., "Generating random fuzzy (capacity) measures for data fusion simulations," IEEE Symposium Series on Computational Intelligence (IEEE SSCI), Nov. 27-Dec. 1, 2017, Honolulu, HI.

Ong , B., "A distributed and incremental SVD algorithm for Agglomerative Data Analysis on Large networks," Annual Meeting of the Society for Industrial and Applied Mathematics (SIAM'17), July 10-14, 2017, Pittsburgh, PA.

Ong, B., "Waveform Relaxation with Adaptive Pipelining," Annual Meeting of the Society for Industrial and Applied Mathematics (SIAM'17), July 10-14, 2017, Pittsburgh, PA.

Oommen, T., S. Chatterjee, "Mineral potential in India using Airborne Visible/Infrared Imaging Spectrometer-Next Generation (AVIRIS-NG) data," Eos Trans. AGU, Fall Meet. Suppl., Dec. 11-15, 2017, New Orleans, LA.

Rouleau, M. D., "Advantages and Limitations of Agent-Based Simulation for Bioenergy Sustainability Assessment and Policy Experimentation from the Perspective of Private Family Forest Owners," Int'l Symposium on Society and Resource Management (ISSRM), June 17-21, 2018, Salt Lake City, UT.

Wall, J.D., M.W. Buche, "Integrating Outcome Oriented Policy in Information Security Policies: An Examination of Security Perceptions, Motivations, Intentions," Dewald Roode Workshop on Information Systems Security Research, Oct. 6-7, 2017, Tampa, FL.

Weidner, L., T. Oommen, R. Escobar-Wolf, K.S. Sajinkumar, "Comparison of two physically-based regional landslide susceptibility models in Kerala, India," 60th Annual Meeting of the Association of Environmental and Engineering Geologists, Sep. 10-17, 2017, Colorado Springs, CO.

Zwissler, B., E. Seagren, T. Oommen, S. Vitton, "Development of methodology for laboratory simulation of cold-weather fugitive dust events at mine tailings impoundments and mitigation methods," ASCE Congress on Technical Advancement, Sep. 10-13, 2017, Duluth, MN.

JOURNAL ARTICLES

Armstrong, D.J., C.K. Riemenschneider, M.W. Buche, K. Armstrong, "Mitigating Turnover Intentions: Are all IT Workers Warriors?" *AIS Transactions on Replication Research*, 4(10), 2018.

Bialas, J., T. Oommen, U. Rebbapragada, Bos, J.P., V.S. Gudimetla, J.A. Schmidt, "Differential Piston Phase Variance in Non-Kolomogorov Atmospheres," *Journal of the Optical Society of America A* (JOSAA), 34(8), Aug. 2017.

Bouali, E.H., T. Oommen, R. Escobar-Wolf, "Mapping of slow landslides on the Palos Verdes Peninsula using the California Landslide Inventory and persistent scatterer interferometry," *Landslides*, 15(3), Mar. 2018.

Buikema, N.D., B. Zwissler, E. Seagren, T. Oommen, S. Vitton, "Stabilization of iron mine tailings through biocalcification," *Environmental Geotechnics*, 5(2), Apr. 2018.

Dalman, M.D., M.W. Buche, J. Min, "The Differential Influence of Identification on Ethical Judgment: The Mediating Role of Brand Love," *Journal of Business Ethics*, Dec. 2017.

Deilamsalehy, H., T.C. Havens, "Fuzzy adaptive extended Kalman filter for robust 3D pose estimation," *Int. J. Intelligent Unmanned Systems*, 6(2), Apr. 2018.

Deilamsalehy, H., T.C. Havens, P. Lautala, E. Medici, J. Davis, "An automatic method for detecting sliding railway wheels and hot bearings using thermal imagery," *J. Rail and Rapid Transit*, 231(6), July 2017.

Escobar-Wolf, R., T. Oommen, C.N. Brooks, R. Dobson, T. Ahlborn, "Unmanned aerial vehicle (UAV)-based assessment of concrete bridge deck delamination using thermal and visible camera sensors: a preliminary analysis," *Research in Nondestructive Evaluation*, 2017.

Frank, J., U. Rebbapragada, J. Bialas, T. Oommen, T. Havens, "Effect of label noise on the machine-learned classification of earthquake damage," *Remote Sensing*, 9(8), Aug. 2017.

Gunasekara, C., K. Zhang, W. Deng, L. Brown H. Wei, "TGMI: an efficient algorithm for identifying pathway regulators through evaluation of triple-gene mutual interaction," *Nucleic Acids Res.*, 46(11), June 2018.

Hu, X., T. Oommen, Z. Lu, T. Wang, J. Kim, "Consolidation settlement of Salt Lake County tailings impoundment revealed by time-series InSAR observations from multiple radar satellites," *Remote Sensing of Environment*, 202, Dec. 2017.

Kern, A., P. Addison., T. Oommen, S. Salazar, R. Coffman, "Machine learning based predictive modeling of debris flow probability following wildfire in the intermountain Western United States," *Mathematical Geosciences*, 49(6), 717-735, Aug. 2017.

Keyport, R.N., T. Oommen, T.R. Martha, K.S. Sajinkumar, J.S. Gierke, "A comparative analysis of pixel-and object-based detection of landslides from very high-resolution images," *Int'l Journal of Applied Earth Observation and Geoinformation*, 64, Feb. 2018.

Liu, Z., J. Zhu, X, Yang, H. Wu, Q. Wei, H. Wei, H. Zhang, "Growth performance, ion organ-level relations and osmotic regulation of Elaeagnus angustifolia in response to salt stress," *PloS ONE*, 13(1), Jan. 2018.

Lu, T., L. Liu, M. Wei, Y. Liu, Z. Qu, C. Yang, H. Wei, Z. Wei, "The effect of poplar PsnGS1 overexpression on growth and secondary cell wall and fibre characteristics in tobacco," F*rontier of Plant Science*, 9(9), Jan. 2018.

Naidu, S., K.S. Sajinkumar, T. Oommen, V.J. Anuja, R.A. Samuel, C. Muraleedharan, "Early warning system for shallow landslides using rainfall threshold and slope stability analysis," *Geoscience Frontiers*, 9(6), Nov. 2017.

INVITED TALKS

Benjamin Ong
"Fast Summation methods," Applied Math Seminar, Jan. 31, 2018, Michigan Tech.
"William Seed Grant Proposal," ICC Tech Talks, Feb. 16, 2018.

Thomas Oommen
"Remote Sensing Technologies for Highway Infrastructure Monitoring," Lectern Lecture, Innovations and Advances in Transportation Geotechnics, Transportation Research Board, Washington, DC, Jan. 2018.
"Resilient Transport: Landscape-level Risk Management of Roads in Afghanistan," World Bank, Washington, DC, Oct., 2017.
First Erudite Scholar, organized by Univ. of Kerala, India:
"Theoretical Aspects of Interferometric Synthetic Aperture Radar (InSAR) Technology," Dept. of Geology, Indian Institute of Space Science Technology, Valiamala, Kerala, Sep., 2017.
"Building and Forgetting is not an option- Role of Remote Sensing in Asset Management and Infrastructure Monitoring," Dept. of Geology, College of Engineering, Trivandrum, Kerala, Sep. 2017.
"State-of-the-Art techniques in Asset Management and Infrastructure Monitoring," Dept. of Geology, Univ. of Kerala, Kariavattom, Kerala, Sep. 2017.
"Drone: A new toy in the tool kit of Engineering Geology," Dept. of Geology, Univ. of Kerala, Kariavattom, Kerala, Sep. 2017.
"Landslide analysis: Tools and techniques," Dept. of Geology, Government Engineering College, Barton Hill, Kerala, Sep. 2017.

Mark Rouleau
"Agent-Based Modeling for Environmental and Resource Management: Designing A Policy Planning Tool," Seminar Series of the School of Agriculture and Economics, University of Western Australia, Perth, Nov. 2017.

Center for Data Sciences

DataS

CONT'D FROM PREVIOUS PAGE

Nuchitprasitchai, S., M.C. Roggemann, J.M. Pearce, "Factors effecting real-time optical monitoring of fused filament 3D printing," *Progress in Additive Manufacturing*, 2(3), Sep. 2017.

Nuchitprasitchai, Siranee, M.C. Roggemann, J.M. Pearce, "Three Hundred and Sixty Degree Real-Time Monitoring of 3-D Printing Using Computer Analysis of Two Camera Views," *Journal of Manufacturing and Materials Processing*, 1(1), 2, July 2017.

Oats, R.C., R. Escobar-Wolf, T. Oommen, "A novel application of photogrammetry for retaining wall assessment," *Infrastructures*, 2(3), 10, Aug. 2017.

Ong, B., B. Mandal, "Pipeline Implementations of Neumann-Neumann and Dirichlet-Neumann Waveform Relaxation Methods," *Numerical Algorithms*, 78(1), 1-20, May 2018.

Oommen, T., Cobin P., J.S. Gierke, K.S. Sajinkumar, "Significance of variable selection and scaling issues for probabilistic modeling of rainfall-induced landslide susceptibility," *Spatial Information Research,* 26(1), Feb. 2018.

Pinar, A.J., J. Rice, L. Hu, D.T. Anderson, T.C. Havens, "Efficient multiple kernel classification using feature and decision level fusion," *IEEE Trans. Fuzzy Systems*, 25(6), CIS Publication Spotlight, December 2017.

Pinar, A.J., T.C. Havens, "Efficient Multiple Kernel Classification Using Feature and Decision Level Fusion," *IEEE Transactions on Fuzzy Systems*, 25(6), Dec. 2017.

Pinar, A.J., T.C. Havens, "Measures of the Shapley Index for Learning Lower Complexity Fuzzy Integrals in Granular Computing," *Granular Computing*, 2(4), Dec. 2017.

Pischke, E. C, M.D. Rouleau, K.E Halvorsen, "Public perceptions toward oil palm cultivation in Tabasco, Mexico," *Biomass and Bioenergy*, 112, May 2018.

Riemenschneider, C.K., M.W. Buche, D.J. Armstrong, "He Said, She Said: Communication Theory of Identity and The Challenges Men Face in the IS Workplace," *The Data Base for Advances in Information Systems,* 2018.

Rouleau, M.D., T. L Sharik, A.M. Wellstead, S. Whitens, Enrollment Decision-Making in U.S. Forestry and Related Natural Resource Programs," *Natural Sciences Education*, 46, July 2017.

Schulz, T.J., "Piston alignment for a segmented-aperture imaging system by using piston-sweep phasing," *Optics Letters*, 42(15), Aug. 2017.

Sweidan, H.I., T.C. Havens, "Sensor relocation for improved target tracking," *IET Wireless Sensor Systems*, 8(2), April 2018.

Tarshizi, E.K., M.W. Buche, B. Inti, R. Chappidi, "Text Mining Methodologies on Report Documents," project with Data Science graduate students, T*ransactions of the Society for Mining, Metallurgy, Exploration, Inc.*, 70(4), 2018.

Wall, J.D., M.W. Buche, "To fear or not to fear? A critical review and analysis of fear appraisals in the information security context," *Communications of the Association for Information Systems*, 41(13), 2017

Wei, H., "Construction of a hierarchical gene regulatory network centered around a transcription factor," *Briefing in Bioinformatics*, Nov. 2017.

Zwissler, B., T. Oommen, S. Vitton, E. Seagren, "Thermal remote sensing for moisture content monitoring of mine tailings: laboratory study," *Environmental and Engineering Geoscience*, 23(4), Nov. 2017.

CONFERENCE PROCEEDINGS

Ahrawal, U., T. Pinar, C. Wagner, T.C. Havens, D. Soria, J. Garibaldi, "Comparison of fuzzy integral-fuzzy measure based ensemble algorithms with state-of-the-art ensemble algorithms," *Proc. of Int. Conf. on Info. Process. and Management of Uncertainty*, June 2018, Cadiz, Spain.

Bos, J.P., "Imaging through turbulence: a light-field approach," *Proc. of Adv. Maui Optical and Space Surveillance Technologies Conf.*, Sep. 19-22, 2017, Wailea, Maui, HI.

Bouali, E.H., T. Oommen, K.S. Sajinkumar, "Monitoring India's dams from space: A cost-effective approach using Sentinel-1 radar images," *Proc. of Int'l Dam Safety Conf.*, Jan. 23-24, 2018, Thiruvananthapuram, India.

Bouali, E.H., T. Oommen, R. Escobar-Wolf, "Structure mapping through spatial and temporal deformation monitoring using persistent scatterer interferometry and geographic information systems," *Proc. of Geotechnical Frontiers Conf.,* Mar. 13-16, 2017, Orlando, FL.

Byrne, D., N. Önder, Z. Wang, "mPart: Miss-Ratio Curve Guided Partitioning in Key-Value Stores," *Proc. of ACM SIGPLAN Int'l Symposium on Memory Management* (ISMM), June 18, 2018, Philadelphia, PA.

Cummings, I.T., T.J. Schulz, J.P. Doane, T.C. Havens, "An information-theoretic approach to partitioning simultaneous transmit and receive digital phased arrays," *Proc. of the IEEE Radar Conf.*, April 2018.

Deilamsalehy, H., T.C. Havens, P. Lautala, "Sensor fusion of wayside visible and thermal imagery for rail car wheel and bearing damage detection," *Proc. of Joint Rail Conf.*, 2017.

Havens, T.C., "Generating random fuzzy (capacity) measures for data fusion simulations," *Proc. of IEEE Symposium Series on Computational Intelligence*, Nov. 27-Dec. 1, 2017, Honolulu, HI.

Havens, T.C., A.J. Pinar, "Generating random fuzzy (capacity) measures for data fusion simulations," *Proc. of IEEE Symp.. Series Comp. Intell.*, Nov. 27-Dec. 1, 2017.

Havens, T.C., C. Wagner, D.T. Anderson, "Efficient modeling and representation of agreement in interval-valued data," *Proc. of the IEEE Int. Conference on Fuzzy Systems*, July 9-12, 2017.

Hu, X., Z. Lu, T. Oommen, T. Wang, J. Kim, "Monitoring and modeling tailings impoundment settlement near Great Salt Lake (Utah) using multi-platform time-series InSAR observations," *Proc. of Geoscience and Remote Sensing Symposium* (IGARSS), July 23-28, 2017, Fort Worth, TX.

Islam, M.A., D.T. Anderson, X. Du, T.C. Havens, C. Wagner, "Efficient binary fuzzy measure representation and Choquet integral learning," *Proc. of the Int. Conf. on Info. Process and Management of Uncertainty,* June11-15, 2018, Cadiz, Spain.

Jafari, M., L.E. Brown, L.A. Gauchia, "Bayesian Framework for EV Battery Capacity Fade Modeling," *Proc. of IEEE Transportation Electrification Conf. and Expo* (ITEC), June 13-15, 2018, Long Beach, CA.

Kabir, S., C. Wagner, U. Aickelin, D.T. Anderson, T.C. Havens, "Novel similarity measure for interval-valued data based on their overlapping ratio," *Proc. of the IEEE Int. Conf. Fuzzy Systems*, July 9-12, 2017.

Lechner, H., M.S. Rouleau, "Hazard Awareness and Evacuation Decision-Making at Pacaya Volcano," *Proc. of American Geophysical Union Fall Meeting* (AGU), Dec. 11-15, 2017, New Orleans, LA.

Sharik, T. L., M.D. Rouleau, A.M. Wellstead, "National Trends in Forestry and Natural Resource Related Degree Programs," *Proc. of Society of American Foresters National Convention* (SAF), Nov. 15-19, 2017, Albuquerque, NM.

Liu, J., L.E. Brown, J.W. Dexheimer, S.A. Spooner, "Detection of Weight Data-Entry Errors," *Proc. of American Medical Informatics Association Annual Symposium* (AMIA), Nov. 4-8, 2017, Washington, DC.

Ofori, R., M.S. Rouleau, "Using Agent-Based Modeling to Explore the Social, Environment, and Policy Impacts of Seaweed Invasion in the Coastal Communities of Ghana," *Proc. of Int'l Symposium on Society and Resource Management* (ISSRM), June 17-21, 2018, Salt Lake City, UT.

Pinar, A.J., T.C. Havens, D.T. Anderson, M.A. Islam, "Visualization and learning of the Choquet integral with limited training data," *Proc. of the IEEE Int. Conf. Fuzzy Systems,* July 9-12, 2017.

Sajinkumar, K.S., T. Oommen, "Need for creating landslide atlas of a region," *Proc. of 4th Indian Landslide Congress,* Dec. 8-9, 2017, Mumbai, India.

Tang, Y., C. Ten, L.E. Brown, "Switching reconfiguration of fraud detection within an electrical distribution network," *Proc. of Resilience Week* (RWS'17), Sep. 18-22, 2017, Wilmington, DE.

Wagner, C., T.C. Havens, D.T. Anderson, "The arithmetic recursive average as an instance of the recursive weighted power mean," *Proc. of the IEEE Int. Conf. on Fuzzy Systems*, July 9-12, 2017, Naples, Italy.

Center for
Human-Centered Computing

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RESEARCH AREAS
- **MULTIMODAL INTERACTIONS**
- **HUMAN-AGENT INTERACTIONS**
- **ASSISTIVE TECHNOLOGIES AND INTELLIGENT HEALTH**
- **SOFTWARE EDUCATION**
- **NOVEL INTERFACES**
- **COMPUTATIONAL MODELING**
- **EXPLANATION IN SYSTEMS**
- **COLLABORATION AND TRUST**
- **DECISION MAKING AND ADAPTIVE LEARNING**

EDITORIAL BOARDS

Myounghoon (Philart) Jeon

Associate Editor: *Int'l Journal of Human-Computer Studies*.

Guest Editor (with Paul Fishwick), Special issue on "Arts, Aesthetics and Performance in Telepresence" in the MIT Press journal, *Presence: Teleoperators and Virtual Environments*, 26(2), Spring 2017.

Shane Mueller

Journal Reviewer: *Acta Psychologica*.

Kevin Trewartha

Journal Reviewer: *Human Movement Science; Medicine and Science in Sports and Exercise; Neuropsychologia; Psychology and Aging; Scientific Reports; The Clinical Neuropsychologist; Journal of Experimental Psychology*.

Journal Editor: *Int'l Journal of Human Computer Studies; IEEE Pervasive Computing; TOCHI: ACM Transactions on Computer-Human Interaction*.

Conf. Proc. Editor: CHI '18: ACM Int'l Conf. on Human Factors in Computing Systems.

Conf. Paper Reviewer: ASSETS '18: ACM SIGACCESS Conf. on Computers and Accessibility; MobileHCI '17: ACM Int'l Conf. on Human-Computer Interaction with Mobile Devices and Services; UIST '17: ACM Symposium on User Interface Software and Technology.

PROFESSIONAL SERVICE

Scott Kuhl

Publications Co-Chair, 2018 IEEE Virtual Reality Conference.

Myounghoon (Philart) Jeon

General Chair, 24th Int'l Conf. on Auditory Display (ICAD), June 10-15, 2018, Mich. Tech, Houghton, MI.

Kevin Trewartha

Councilor at Large, Mich. Society for Neuroscience.

Elizabeth Veinott

Organizer, Michigan Decision Conf., May 2018, Ann Arbor, MI.

Associate Chair, CHI Games Track, ACM CHI Conf. on Human Factors in Computing Systems (CHI), 2017-2018, Montreal, Canada.

Associate Chair, ACM CHI-Play Conference on HCI in Games and Interactive Play, Melbourne, Australis, 2017-2018.

Co-Chair, Doctoral Consortium, 2018 ACM CHI-Play Conference on HCI in Games and Interactive Play, Melbourne, Australia, 2017-2018.

Keith Vertanen

NSF Panelist, Information and Intelligent Systems Division, 2018.

Associate Chair, User Experience and Usability, ACM CHI Conf. on Human Factors in Computing Systems (CHI), Apr. 21-26, 2018, Montreal, Canada.

Presenter, ACM SIGCHI Summer School on Research Methods and Approaches to Text Entry and Other Interaction Techniques, May 21-25, 2018, Mumbai, India.

UNIVERSITY SERVICE

Scott Kuhl

Advisor, Husky Game Dev. Enterprise.

Chair, Computer Science Chair Evaluation Committee, 2016-2017.

Computer Science TPR Committee, 2015-present.

Faculty Advisor, Summer Youth Program, 2011-present.

Faculty Advisor, Lutheran Campus Ministry, 2016-present.

Kevin Trewartha

Faculty Senate, 2018-2021.

Pavlis Honors College Internal Advisory Board, 2018-present.

Biomachanics Faculty Search Committee, CLS Dept., 2017-2018.

Chair, Psychology Lecturer Search Committee, CLS Dept., 2017-2018.

Dean Search Committee, CLS Dept., 2017-2018.

Forum Organizer, CLS Dept., 2016-present.

Graduate Program Committee, CLS Dept., 2016-present.

Diversity Liaison Program, CLS Dept., 2016-present.

Elizabeth Veinott

University Evaluation Committee, Goal 4 and Goal 8, 2017-present.

CLS Dept. Graduate Committee, 2017-present.

Chair, Marketing Committee, CLS Dept., 2017-2018.

CIS Curriculum Committee, 2017-2018.

Keith Vertanen

Graduate Committee, CS Dept., 2017-2018.

ABET Assessment Committee, CS Dept., 2015-2017.

CONFERENCE PRESENTATIONS AND ABSTRACTS

Hosseini Fakhr, M. (Graduate student of M. Jeon), "Robot theater with children for STEAM education," Human Factors and Ergonomics Society Annual Meeting (HFES), Oct. 9-13, 2017, Austin, TX.

Kelliher, E., M. Peabody, E. Veinott, "Premortem: Evaluating two structured analytic techniques for group brainstorming," Convention of the Assoc. for Psychological Science (APS), May 24-27, 2018, San Francisco, CA.

Maanika, C., L. Rajesh Kumar, S. J. Elmer, J. J. Durocher, K. M. Trewarth, "Associations between Physical Fitness, Cognitive Functioning, and Motor Learning in Older Adults: A Preliminary Study," Meeting of the Mich. Physiological Society, June 14-15, 2018, Houghton, MI.

Nelson, B. L., S. T. Mueller, "The Use of Mental Models for Hurricane Prediction and Evacuation Decisions," Society for Judgment and Decision Making Conf., Nov. 10-13, 2017, Vancouver, Canada.

Schreifels, D., S. T. Mueller, "A lightweight hybrid model of visual search and target-based saliency," Annual Meeting on Object Perception, Attention, and Memory (OPAM XXV), Nov. 8-9, 2017, Vancouver, Canada.

Sergeyev, A., N. Alaraje, S. Kuhl, "Researching for Effective Teaching Methodologies in Industrial Robotics," 9th Int'l Conf. on Education, E-Business, E-Management, and E-Learning (IC4E), Jan. 11-13, 2018, San Diego, CA.

Sergeyev, A., S. Kuhl, V. V. Druschke, J. Hooker, "Implementation of Robotic Vision into the Simulation Environment," Int'l Conf. on Engineering and Technology, 2018.

Vasey, Eric (Grad student of M. Jeon), "Development and usability testing of a remote control app for an interactive robot," Human Factors and Ergonomics Society Annual Meeting (HFES), Oct. 9-13, 2017, Austin, TX.

Veinott, E., K. Roos, "From Dragon Slayer to Problem Solver: Video Games as a Warm-Up for Problem Solving," Digital Media and Learning Conf., Oct. 4-6, 2017, Irvine, CA.

HCC SPONSORSHIPS

24th Int'l Conf. on Auditory Display (ICAD'18), June 10-15, 2018, at Michigan Tech, Houghton, MI.
HCC Demo Day, November 2, 2017, on the Michigan Tech campus, which showcased the work of researchers who "design with humans in mind" through a series of demos, lectures, and tours. ICC Distinguished Lecturer, Dr. Elizabeth Whitaker from Georgia Tech Research Institute (GTRI), presented a talk titled, "How Can Cognitive Systems Support Humans in Solving Problems?"

MEDIA INTEREST

Keith Vertanen's NSF CAREER project was featured in a story in the Daily Mining Gazette, spring 2018.
The story, "Keith Vertanen Wins CAREER Award" was published on the Michigan Tech News site, May 3, 2018.
Keith Vertanen's NSF CAREER Award was the subject of the story, "Michigan Tech professor awarded $500,000 in funding," on UP Matters, WJMN-TV3, May 16, 2018.
Written by Scott Kuhl, the story "Community College Collaboration Preps Students For Industry" was published on the Michigan Tech News site Aug. 30, 2018. The article outlines the results of an NSF grant involving Scott Kuhl, Alex Sergeyev, and Bay de Noc Community College, which aims to make robotics education more accessible to both students and displaced workers.

Center for
Human-Centered Computing

CONT'D FROM PREVIOUS PAGE

Vertanen, K. D., "The Impact of Word, Multiple Word, and Sentence Input on Virtual Keyboard Decoding Performance," ACM Conf. on Human Factors in Computing Systems (CHI), Apr. 21-26, 2018, Montreal, Canada.

Vertanen, K., "Towards Improving Predictive AAC using Crowdsourced Dialogues and Partner Context," 19th Int'l ACM SIGACCESS Conf. on Computers and Accessibility, Oct. 30-Nov. 1, 2017, Baltimore, MD.

JOURNAL ARTICLES

Burns, R., M. Jeon, C. H. Park, "Robotic Motion Learning Framework to Promote Social Engagement," *Applied Sciences*, 8(2), Feb. 2018.

Buschkuehl, M., S.M. Jaeggi, S.T. Mueller, P. Shah, J. Jonides, "Training change detection leads to substantial task-specific improvement," *Journal of Cognitive Enhancement*, 1(4), Dec. 2017.

González-Giraldo, Y., R. E. González-Reyes, S. T. Mueller, B. J. Piper, A. Adan, D. A. Forero, "Situation Awareness Performance in Healthy Young Adults Is Associated With a Serotonin Transporter Gene Polymorphism," *Psychological Reports,* Nov. 10, 2017.

Hoffman, R.R., S.T. Mueller, G. Klein, "Explaining Explanation, Part 2: Empirical Foundations," *IEEE Intelligent Systems,* 32(4), Aug. 2017.

Li, B., J. Walker, S.A. Kuhl, "The effects of peripheral vision and light stimulation on distance judgments through HMDs," *ACM Transactions on Applied Perception* (TAP), 15(2), Apr. 2018.

Mueller, S.T., Y.-Y. Tan, "Cognitive perspectives on opinion dynamics: the role of knowledge in consensus formation, opinion divergence, and group polarization," *Journal of Computational Social Science*, 1(1), Jan. 2018.

Yoon, H., J. Park, D. Moon, H. Yoon, F. Gomez, B.F. Spencer, "Visual-inertial Displacement Sensing Using Data Fusion of Vision-Based Displacement with Acceleration," *Structural Control Health Monitoring,* Nov. 17, 2017.

CONFERENCE PROCEEDINGS

Javed, H., M. Jeon, A. Howard, C.-H. Park, "Robot-assisted socio-emotional intervention framework for children with Autism Spectrum Disorder, " *Proc. of ACM/IEEE Int'l Conf. on Human-Robot Interaction* (HRI2018), March 5-8, 2018, Chicago, IL.

Khan, R., M. Jeon, T. Yoon, "Musical Exercise for people with visual impairments: A preliminary study with the blindfolded," *Proc. of 24th Int'l Conf. on Auditory Display* (ICAD), June 10-15, 2018, Houghton, MI.

Muhier, M., P. Lautala, A. Salim, M. Jeon, D. Nelson, A. Dean, "The assessment of driver compliance at highway-rail grade crossings based on naturalistic driving study data," *Proc. of Transportation Research Board 97th Annual Meeting*, Washington, DC, Jan. 7-11, 2018.

Roose, K., E. Veinott, "Roller Coaster Park Manager by Day Problem Solver by Night: Effect of Video Game Play on Problem Solving," *Proc. of the ACM SIGCHI Annual Symp. on Computer-Human Interaction in Play* (CHI PLAY)," Oct.15-18, 2017, Amsterdam, Netherlands.

Salim, A., P. Lautala, M. Jeon, D. Nelson, "Using naturalistic driving study data to investigate driver behavior at highway-rail grade crossings," *Proc. of IEEE/ASME Joint Rail Conf.* (JRC), Pittsburgh, PA, April 18-20, 2018.

Tislar, K., B. Nelson, M. Peabody, Z. Duford, M. Jeon, "Examining the learnability of auditory displays: Music, earcons, spearcons, and lyricons," *Proc. of Int'l Conf. on Auditory Display* (ICAD), June 10-15, 2018, Houghton, MI.

Vasey, E., X. Li, T. Yoon, T., M. Jeon, "A preliminary evaluation of a smart exercise application with wearable sensors," *Proc. of Int'l Conf. on Auditory Display* (ICAD), June 10-15, 2018, Houghton, MI.

Vertanen, K., C. Fletcher, D. Gaines, J. Gould, P.O. Kristensson, "The Impact of Word, Multiple Word, and Sentence Input on Virtual Keyboard Decoding Performance," *Proc. of the ACM Conf. on Human Factors in Computing Systems,* Apr. 21-26, 2018, Montreal, Canada.

Vertanen, K., "Towards Improving Predictive AAC using Crowdsourced Dialogues and Partner Context," *Proc. of the 19th Int'l ACM SIGACCESS Conf. on Computers and Accessibility* (ASSETS), Oct. 30-Nov. 1, 2017, Baltimore, MD.

ICC Active Grants and Contracts - Cumulative Total

ICAD 2018
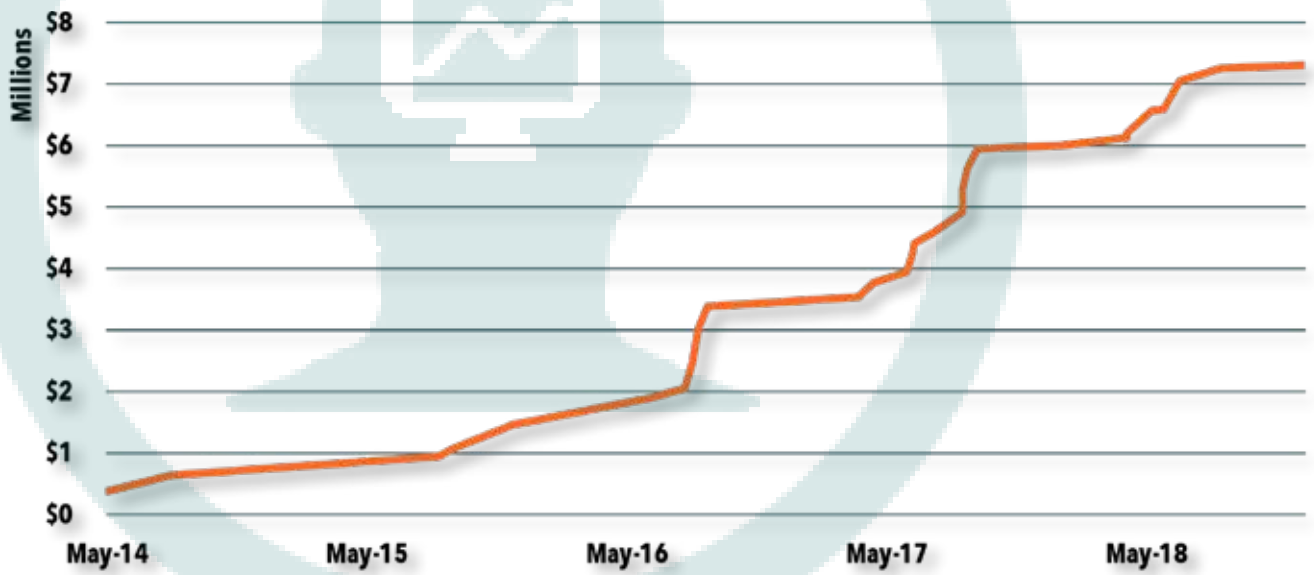
Center for
Scalable Architectures and Systems

RESEARCH AREAS
- **SCALABLE COMPUTER ARCHITECTURE AND SYSTEMS**
- **HETEROGENEOUS PARALLEL AND DISTRIBUTED COMPUTING FOR INFORMATION PROCESSING**
- **EMBEDDED SYSTEMS**
- **DEPENDABLE COMPUTING**
- **FORMAL METHODS**
- **FAULT TOLERANT SYSTEMS**
- **VLSI DESIGN AND CAD**
- **ARCHITECTURES FOR SECURE SYSTEMS**
- **VIRTUALIZATION**
- **SCALABLE ALGORITHMS**

AWARDS
Zafar Iqbal, NSF travel grant, 2018 NSF Smart and Connected Communities (S&CC) Aspiring PI Workshop, co-located with the 4th IEEE Smart Cities Conference (ISC2), Kansas City, MO, Sep. 17, 2018.

Aref Majdar, student of Saeid Nooshabadi, Graduate School Finishing Fellowship Award; ECE Jonathan Bara Award as outstanding Graduate Teaching Assistant.

Gorkem Asilioglu and Zhaoxiang Jin, students of Soner Önder, Graduate School Finishing Fellowship Award.

EDITORIAL BOARDS
Ali Ebnenasir

Reviewer: *IEEE Int'l Symposium on Reliable Distributed Systems; American Mathematical Society; Parallel Processing Letters; ACM Transactions on Embedded Computing Systems.*

Conference Reviewer: SIGCSE Conf., 2018; IEEE Conf. on Teaching, Assessment and Learning for Engineering (TALE), 2018; Int'l Conf. on Software Engineering and Knowledge Engineering (SEKE) 2017, 2018.

Zhuo Feng

Conference Reviewer: IEEE Int'l Symposium on VLSI Design, Automation and Test (VLSI-DAT), 2014-present;

IEEE/ACM Int'l Conf. on Computer-Aided Design (ICCAD), Nov. 13-17, 2017; ACM/IEEE Design Automation Conf. (DAC), May 31-June 28, 2018.

Zafar Iqbal

Journal Reviewer: *IEEE Transactions on Wireless Communications; IEEE Access Electronics Letters; IET Communications Elsevier Microprocessors and Microsystems.*

Saeid Nooshabadi

Editor, *Int'l Journal of Electronics and Communications*.

Soner Önder

Referee: *ACM Transactions on Architecture and Code Optimization; ACM Transactions on Design Automation of Electronic Systems; Elsevier Microprocessors and Microsystems; IEEE Computer Architecture Letters; IEEE Transactions on CAD of Integrated Circuits and Systems; IEEE Transactions on Computers; IEEE Transactions on Very Large Scale Integration Systems; Journal of Instruction Level Parallelism.*

Zhenlin Wang

Journal Reviewer: *IEEE Transactions on Computers; Computer Languages, Systems and Structures; IEEE Transactions on Computers; IEEE Transactions on Parallel and Distributed Systems*.

UNIVERSITY SERVICE
Ali Ebnenasir

Undergraduate Committee, CS Dept., 2012-present.

Qualifying Exam Committee, CS Dept., 2006-present.

Dan Fuhrmann

Eliot Society Membership Committee, 2004-present.

Chair, ESE Graduate Committee, 2003-present.

SEAS Graduate Board, 2003-present.

Chair, EE (ESE) Graduate Admissions Committee, 1986-present.

Electronic Systems and Signals Research Laboratory Committee,1986-present.

Doctoral Examination Committees, 1984-present.

Soner Önder

Graduate Admissions and Policies Committee, CS Dept., 2000-2003, 2017-present.

Zhenlin Wang

CIS Advisory Group, 2017-2018.

Graduate Faculty Council, 2012-2017.

Graduate Assessment Committee, CS Dept., 2017-present.

Tenure, Promotion and Reappointment Committee, CS Dept., 2009-present.

ABET Committee, CS Dept., 2017-2018.

Dir. of Graduate Studies, CS Dept., 2012-2017.

Graduate Committee, CS Dept., 2004-2017.

PROFESSIONAL SERVICE

Ali Ebnenasir

NSF Panelist, 2018.

Zhuo Feng

Organizing Committee, Int'l Workshop on Design Automation for Analog and Mixed-Signal Circuits, Nov. 16, 2017.

Zafar Iqbal

Conference Reviewer: ACM International Conference on Underwater Networks and Systems (WUWNET), 2018; IEEE Global Communications Conference (Globecom), 2018.

Soner Önder

NSF Panelist, 2018.

Program Committee, ICCD 2018, 36th IEEE Int'l Conf. on Computer Design.

Conf. Program Chair, "Laser Communication and Propagation through the Atmosphere and Oceans," SPIE Optics and Photonics, 2017-present.

Conf. Program Committee, "Long-Range Imaging," SPIE Defense and Commercial Sensing, 2015-present.

Session Organizer, "Optical Detection and Analysis for Space Situational Awareness (SSA)," IEEE Aerospace Conf., 2015-2018.

Zhenlin Wang

NSF Paneist, 2018.

Program Committee, Reviewer: 2018 ACM Int'l Conf. on Supercomputing; 2018 Int'l Symposium on Memory Management.

TECHNICAL COMMITTEES

Dan Fuhrmann

Sensor Array and Multichannel Processing Technical Committee, IEEE Signal Processing Society.

Soner Önder

Conference Referee: Int'l Conf. on Architecture of Computing Systems; Architectural Support for Programming Languages and Operating Systems; ACM Int'l Conf. on Computing Frontiers; High Performance Computing; IEEE Int'l Symposium on High Performance Computer Architecture; IEEE Int'l Performance Computing and Communications Conf.; ACM Compilers and Tools for Embedded Systems; IEEE/ACM Annual Int'l Symposium on Microarchitecture; IEEE/ACM Int'l Conf. on Parallel Architectures and Compilation Techniques.

CONFERENCE PRESENTATIONS

Feng, Z., "Towards Practically-Efficient Spectral Sparsification of Graphs," SIAM Annual Meeting (AN17) and Carnegie Mellon University, Pittsburgh, PA, July 10-14, 2017.

JOURNAL ARTICLES

Feng, Z., "Similarity-Aware Spectral Sparsification by Edge Filtering," *arXiv.org*, Nov. 2017.

García, J.C., J.A. Montiel-Nelson, S. Nooshabadi, "2V Single Supply CMOS Level–up Shifter for Low Energy Systems," *Journal of Low Power Electronics,* 13(4), Dec. 2017.

INVITED TALKS

Zhuo Feng

HC Torng Lecture, Department of Electrical and Computer Engineering, Cornell University, Ithaca, NY, Oct. 2018.

Department of Computer Science and Engineering, University of California San Diego, Nov. 2017.

Department of Electrical and Computer Engineering, Duke University, Durham, NC, Oct. 2017.

"Towards Practically-Efficient Spectral Sparsification of Graphs," Carnegie Mellon University, Pittsburgh, PA, July 2017.

Ali Ebnenasir

"Topology-Specific Synthesis of Parameterized Fault-Tolerant Protocols with Constant-Space Processes," Mid-West Workshop on Programming Languages, University of Wisconsin, Madison, WI, Oct. 2018.

"Designing Dependable Distributed Software: The State-of-the-Art and Future Directions," KTH Royal Institute of Technology, Stockholm, Sweden, Aug. 2017.

"Algorithmic Design of Dependable Distributed Systems," The University of Western Australia, Perth, Australia, July 2017.

PRESS INTEREST

Zafar Iqbal was quoted in the story, "Blocked by Trump in the US, China Takes Detour to Develop Military-Grade Semiconductor Chips," in *The Epoch Times*, June 14, 2018.

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Hajisheykhi, R., A. Ebnenasir, S.S. Kulkarni, "A Theory of Integrating Tamper Evidence with Stabilization, E*LSEVIER Science of Computer Programming,* 160(1), 93-114, Aug. 2018.

Hu, X., X. Wang, L. Zhou, Y. Luo, Z. Wang, C. Ding, C. Ye, "Fast MRC Modeling for Storage Cache," *ACM Transactions on Storage (TOS),* 14(2), May 2018.

Nooshabadi, S.V., C. Jiang, "Multi-level complexity reduction for HEVC multiview coding," *Journal of Real-Time Image Processing,* 1-17, Feb. 2018.

Raza, M. A., Z. Iqbal, S.-S. Byun, H. Kang, and H.-N. Lee, "A versatile coexistence decision-making system for efficient TV whitespace sharing among whitespace objects," *Wireless Communications and Mobile Computing,* Oct. 2017.

Wang, Y., Z. Feng, "Towards Scalable Spectral Clustering via Spectrum-Preserving Sparsification," *arViv.org,* Oct. 2017.

Zhang, Y., Z. Zhao, Z. Feng, "Towards Scalable Spectral Sparsification of Directed Graphs," *arXiv.org,* Dec. 2018.

Zhao, Z., Y. Wang, Z. Feng, "Nearly-Linear Time Spectral Graph Reduction for Scalable Graph Partitioning and Data Visualization," *arXiv.org,* Dec. 2018.

CONFERENCE PROCEEDINGS

Byrne, D., N. Önder, Z. Wang, "mPart: Miss-Ratio Curve Guided Partitioning in Key-Value Stores," *Proc. of the Int'l Symposium on Memory Management* (ISMM'18), June 18-22, 2018, Philadelphia, PA.

Feng, Z., "Similarity-Aware Spectral Sparsification by Edge Filtering," *Proc. of ACM/IEEE Design Automation Conf.* (DAC), June 24-29, 2018, San Francisco, CA.

Hiebel, J., L. Brown, Z. Wang, "Constructing Dynamic Policies for Paging Mode Selection," *Proc. of Int'l Conf. on Parallel Processing* (ICPP), Aug. 13-16, 2018, Eugene, OR.

Jin, Z., S. Önder, "A two-phase recovery mechanism," *Proc. of the 32nd Int'l Conf. on Supercomputing* (ICS), June 12-15, 2018, Beijing, China.

Jin, Z., S. Önder, "Dynamic Memory Dependence Predication," *Proc. of the 45th Int'l Symposium on Computer Architecture* (ISCA), June 2-6, 2018, Los Angeles, CA.

Liu, Y., X. Zhao, M. Jahre, Z. Wang, X. Wang, Y. Luo, L. Eeckhout, "Get Out of the Valley: Power-Efficient Address Mapping for GPUs," *Proc. of Int'l Symp. on Computer Architecture,* June 2-6, 2018, Los Angeles, CA.

Liu, Y., X. Zhao, Z. Yu, Z. Wang, X. Wang, Y. Luo, L. Eeckhout, "BACM: Barrier-Aware Cache Management for Irregular Memory-intensive GPGPU Workloads," *Proc. of 2017 Int'l Conf. on Computer Design,* Sep. 9-13, 2017, Boston, MA.

Stokes, M., R. Baird, Z. Jin, D. Whalley, S. Önder, "Decoupling Address Generation from Loads and Stores to Improve Data Access Energy Efficiency," P*roc. of ACM SIGPLAN/SIGBED Conf. on Languages, Compilers, and Tools for Embedded Systems* (LCTES), June 18-22, 2018, Philadelphia, PA.

ICAD 2018

Xiang, Y., X. Wang, Z. Huang, Z. Wang, Y. Luo, Z. Wang, "DCAPS: Dynamic Cache Allocation with Partial Sharing," *Proc. of EuroSys Conf.* (EuroSys), Apr. 23-26, 2018, Porto, Portugal.

Zhao, Z., Y. Wang, Z. Feng, "AMG: Sparsified Graph Theoretic Algebraic Multigrid for Solving Large Symmetric Diagonally Dominant (SDD) Matrices," *Proc. of IEEE/ACM Int'l Conf. on Computer-Aided Design* (ICCAD), Nov. 13-16, 2017, Irvine, CA.

Chen, P., J. Yue, X. Liao, H. Jin, "Simultaneously Optimizing DRAM Cache Latency and Hit Rate", *Proc. of the 35th IEEE Int'l Conf. on Computer Design* (ICCD), Nov. 5-8, 2017, Boston, MA.

Liu, Y., X. Zhao, Z. Yu, Z. Wang, X. Wang, Y. Luo, L. Eeckhout, "BACM: Barrier-Aware Cache Management for Irregular Memory-intensive GPGPU Workloads," *Proc. of the 2017 Int'l Conf. on Computer Design* (ICCD), Nov. 5-8, 2017, Boston, MA.

Safari, M., A. Ebnenasir, "Locality-Based Relaxation: An Efficient Method for GPU-based Computation of Shortest Paths," *Proc. of the Second IFIP Int'l Conf. on Topics in Theoretical Computer Science* (TTCS), Sept. 12-14, 2017, Tehran, Iran.

Zhao, Z., Z. Feng, "A Spectral Graph Sparsification Approach to Scalable Vectorless Power Grid Integrity Verification," *Proc. of 54th ACM/EDAC/IEEE Design Automation Conf.* (DAC), June 18-22, 2017, Austin, TX.

Klinkhamer, A., A. Ebnenasir, "Synthesizing Parameterized Self-Stabilizing Rings With Constant-Space Processes," *Proc. of the 7th IPM Int'l Conf. on Fundamentals of Software Engineering* (FSEN), April 26-28, 2017, Tehran, Iran.

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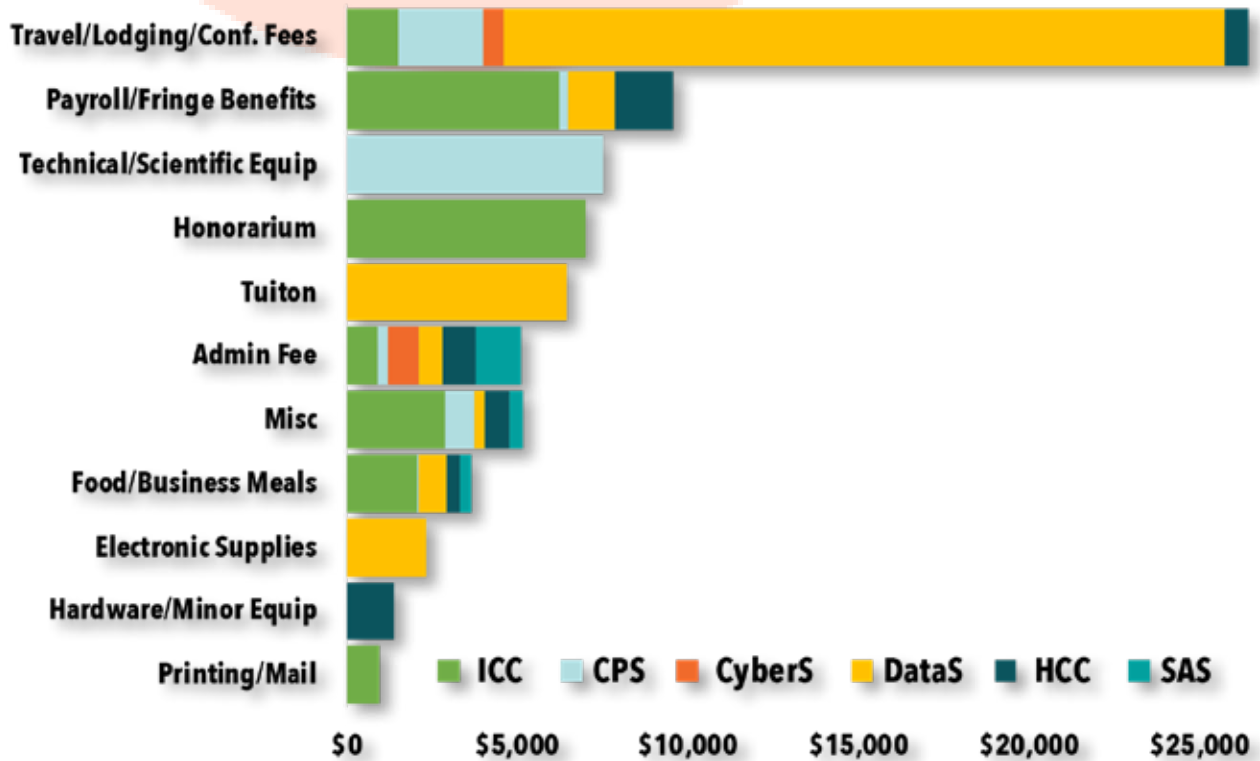
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ICC Research Centers

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