



institute of computing & cybersystems

icc.mtu.edu

ANNUAL REPORT FY16

June 30, 2016

Min Song, ICC Founding Director
Daniel R. Fuhrmann, Co-Director



Michigan
Technological
University

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Executive Summary

On July 1, 2015 Michigan Technological University established the Institute of Computing and Cybersystems (ICC). The institute has grown its diverse membership to 46 dedicated faculty members from 12 different schools and departments who function within five specialized centers. Their expertise and willingness to work across traditional boundaries has allowed the institute to more than double its original Year 1 funding goal with a total of \$3.7 million in research funding to date.

The ICC has also secured two generous alumni donations totalling over \$700K, and \$100K per year for the future (period TBD.) These donations have allowed the ICC to put their plans for cutting-edge, collaborative research in motion. These funds are being used to support two visiting faculty members for the 2016-2017 academic year, and to support seed research projects by ICC investigators.

Focusing on collaboration, ICC centers are supporting their members by providing monthly “red-teaming” workshops of project ideas and proposals. Collectively, members have over 150 publications in top-ranked journals, over 32 proposals submitted, have attended numerous conferences worldwide, and have participated in an ICC sponsored NSF proposal writing panel.

In addition to focusing on research, members have been taking active roles in their fields by attending conferences, conducting workshops and editing journals. One example is Shiyun Hu, who was named an ACM Distinguished Speaker in 2015. He founded and co-chaired the IEEE Technical Committee on Cybernetics for Cyber-Physical Systems—the first technical committee related to Cyber-Physical Systems (CPS) across all Institute of Electrical and Electronics Engineers (IEEE) societies. Min Song was appointed IEEE Communications Society Director of Conference Operations for 2016-2017. And Philart Jeon received the Best Paper Award at the ArtsIT 2016 Conference.

ICC members are not only contributing to Michigan Tech's reputation as a premier research university while at conferences around the world, they are also doing it here on campus. Through the Distinguished Lecturer Series members have the opportunity to bring top-tier scholars and creative professionals in the field of computing to campus to share innovative research results and future plans. The ICC had four invited speakers visit the campus in 2015 and have four confirmed for Fall 2016.

The ICC is in constant pursuit of ways to raise its visibility, and that of its parent organization, the Alliance for Computing, Information, and Automation (ACIA). This includes the following 2015 achievements:

Mission

The mission of the Institute of Computing and Cybersystems (ICC) is to promote research and learning experiences in the areas of cyber-physical systems, cybersecurity, data sciences, human-centered computing, and scalable architectures and systems for the benefit of Michigan Tech and society at large.

Objectives

- Bring faculty and students across campus together to discover innovative new knowledge in the field of computing
- Foster interdisciplinary collaborations and enable faculty to develop multi-disciplinary proposals and conduct impactful research which otherwise would not be possible
- Create a platform for broad sets of national and international collaborations to make valuable contributions to the field
- Promote Alliance for Computing, Information, and Automation (ACIA) external visibility



Executive Summary cont'd

- Developing a web presence to increase the visibility of the two organizations. Since its launch in January, the website has had 905 unique visitors from 64 different countries.
- Releasing its first newsletter in May which was sent to over 200 of the top academic departments and funding agencies nationwide.
- Sponsoring IEEE INFOCOM 2016, a top-ranked conference on computing in the research community.
- Upholding communication with Michigan Tech alumni, friends and active industry partners. In the past year the ICC has presented two status reports to a group of Silicon Valley entrepreneurs, including Dave House, Kanwal Rekhi and Patrick Moore. The meetings were the perfect forum to communicate the ICC's progress and future goals and to receive valuable feedback. After the November meeting, Dave House voiced his support of the ICC and its mission with a generous donation from The House Family Foundation.

In addition to surpassing funding goals, another goal was surpassed in 2015 with a total of 32 (23 full-time) students supported by ICC grants. These students are earning invaluable experience working with faculty in all areas of computing and cybersystems and for multiple

funding sponsors including NSF, U.S. Army Research Office, Google, NIH among others. One notable project is by Philart Jeon who used theatre to introduce children to robotics and computing. His graduate students assisted in directing a play which starred children from Dollar Bay Elementary School's after-school program and six robots from the Mind Music Machine Lab. The program helped the young students gain exposure to technology and the arts.

2015-2016 was an exciting inaugural year for the ICC. The participation, flexibility, and tenacity of its members helped build a strong institutional foundation upon which it has been able to grow. The Institute has made many strides in achieving its ongoing goals, brought faculty and students together to discover innovative new ideas and begun fostering interdisciplinary collaborations and developing multidisciplinary proposals. The Institute has strengthened its relationships with funding agencies, industry, alumni, and donors.

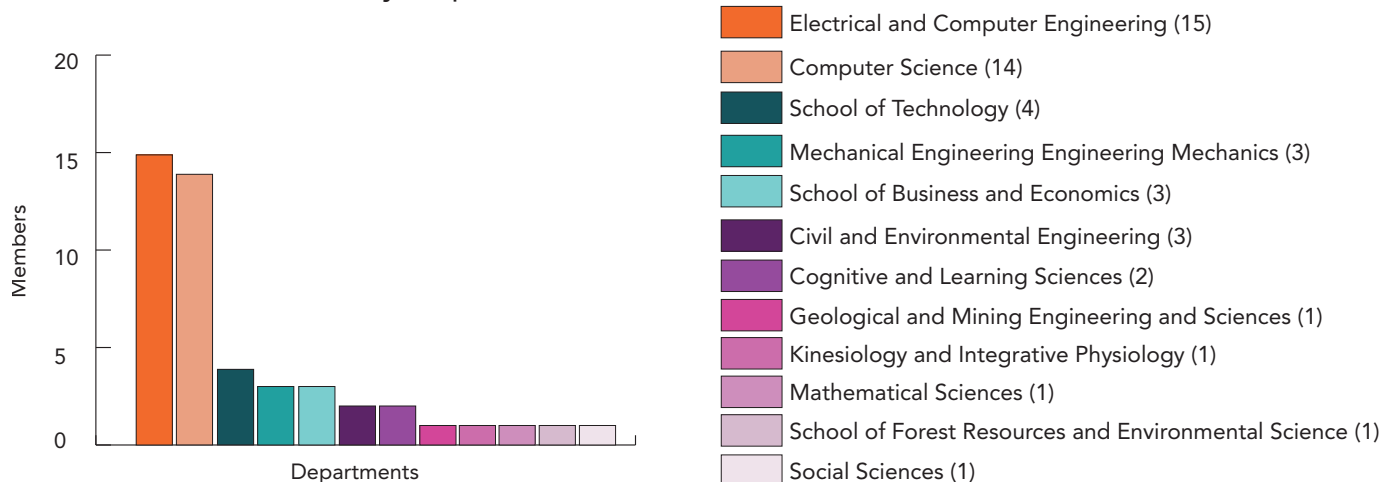
Looking forward, the ICC, its leadership and members will strive to focus on multifaceted and interdisciplinary projects that address regional and national priorities. They will concentrate on harnessing the power of their fellow members, as well as their national and international academic colleagues and industry partners to discover, explore, and execute new ideas and technologies.



Membership

The ICC currently has 46 members from 12 different departments/schools.

ICC Members by Department



*Additional member amount accounts for dual appointments

Current ICC Members

Center for Cyber-Physical Systems (CPS)

- Shiyang Hu - Center Director
- Bo Chen
- Zhen Liu
- Nina Mahmoudian
- Sumit Paudyal
- Ye (Sarah) Sun
- Jinshan Tang
- Chee-Wooi Ten
- Zhaohui Wang
- Reza Zekavat
- Kuilin Zhang

Center for Cybersecurity (CyberS)

- Guy Hembroff - Center Director
- Yu Cai
- Min Song
- Jeffrey Wall
- Xinli Wang

Center for Human-Centered Computing (HCC)

- Philart Jeon – Center Director
- Scott Kuhl
- Shane Mueller
- Leo Ureel
- Keith Vertanen
- Hyungchul Yoon
- Tejin Yoon
- Jenny Zheng

Center for Data Sciences (DataS)

- Timothy Havens – Center Director
- Jeremy Bos
- Laura Brown
- Mari Buche
- Russell Louks
- Nilufer Onder
- Benjamin Ong
- Thomas Oomman
- Michael Roggemann
- Mark Rouleau
- Timothy Schulz
- Christian Wagner
- Hairong Wei

Center for Scalable Architectures and Systems (SAS)

- Saeid Nooshabadi – Center Director
- Ali Ebneenasir
- Zhuo Feng
- Daniel R. Fuhrmann
- Jean Mayo
- Soner Onder
- Zhenlin Wang
- Stephane Zuckerman

Visiting Professors

The ICC is hiring two visiting faculty members for the 2016-2017 academic year. They are expected to conduct impactful research, collaborate with Institute members, help create new opportunities for external funding, and generally raise the visibility of the Institute.



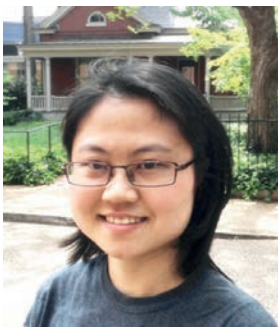
Christian Wagner

Research Interests:

Modeling and handling of uncertain data
Decision support systems and data-driven policy design

Biography:

Christian Wagner is an Associate Professor visiting from The University of Nottingham, UK. He has served as the director of digital economy in the Digital Catapult Researcher in Residence Programme in London, UK. He has published more than 80 peer-reviewed articles, including prize-winning papers in international journals and conferences, most recently being awarded runners-up for both the best regular and best student papers at the IEEE International Conference on Fuzzy Systems 2016 in Vancouver, Canada. He has attracted around £1 million as principal and £6 million as co-investigator in the last six years.



Zhi Zheng

Research Interests:

Human-Machine Interaction
Social Robotics
Human-Centered Computing

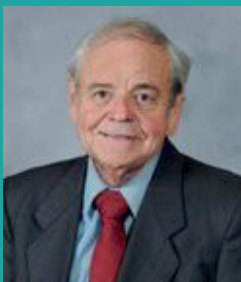
Biography:

Zhi (Jenny) Zheng is a currently a PhD student in the ECE Department at Vanderbilt University, and plans to graduate in August 2016. She received her B.S. (2008) in Biomedical Engineering, and her M.S. (2011) in Pattern Recognition and Intelligent Systems from Xidian University. Then she received her M.S. (2013) from Vanderbilt University. Her broad research interests include Human-Machine Interaction, Social Robotics, and Human-Centered Computing. Zhi has extensive experience on the design and development of technology-assisted intervention systems for children with developmental disabilities. She is also interested in engineering education research.

Donors



Michigan Tech alumnus and philanthropist Dave House has shown his support of the ICC's mission with a generous donation from The House Family Foundation for \$671K. This gift is helping to support the salaries of visiting personnel. He spoke about the importance of the ICC earlier this year, "In today's world the lines between the traditional academic areas have disappeared. Engineers code, programmers design semiconductors, and the technologies they use have merged. The Institute of Computing and Cybersystems provides a platform for collaboration that brings these disciplines together to address tomorrow's opportunities in the classroom, the lab, and the workplace."



Michigan Tech alumnus, Paul Williams has taken an interest in research and collaboration in the past as a major benefactor of the Paul and Susan Williams Center for Computer Systems Research. Now Paul has shown his support for the ICC's commitment to multidisciplinary research and collaboration by donating \$50k in 2016, and \$100k/yr for the future (period TBD). Williams funds will be used to fund seed projects by ICC investigators via an internal competitive proposal process.

Accomplishments

13
New Grants

\$3,717,470
in Funding

150+
Publications

Research Grants

PI: Daniel R. Fuhrmann, SAS
Title: Non-Uniform Sampling A/D Converter
Sponsor: Google Multi-University Research Agreement (MURA)
Amount of Support: \$200,000
Duration of Support: 14 months
Co-PIs: Saeid Nooshabadi, SAS, Aurenice Oliveira

PI: Timothy Havens, DataS
Title: Multisensor Analysis and Algorithm Development for Detection and Classification of Buried and Obscured Targets
Sponsor: U.S. Department of Defense - Army Research Office Funding
Amount of Support: \$99,779
Duration of Support: First year of a potential three-year project totalling \$1,066,799
Co-PI: Timothy Schulz, DataS

PI: Timothy Havens, DataS
Title: Heterogeneous Multisensor Buried Target Detection Using Spatiotemporal Feature Learning
Sponsor: U.S. Department of Defense - Army Research Office Funding
Amount of Support: \$285,900
Duration of Support: First year of a potential 3-year project totalling \$983,124
Co-PI: Timothy Schulz, DataS

PI: Philart Jeon, HCC
Title: NRI: Music-based interactive robotic orchestration for children with ASD
Sponsor: National Institute of Health: National Robotics Initiative Program through George Washington University
Amount of Support: \$76,336
Duration of Support: Second year of funding

PI: Jean Mayo, SAS
Title: VACCS - Visualization and Analysis for C Code Security
Sponsor: National Science Foundation
Amount of Support: \$130,001
Duration of Support: One year

PI: Soner Onder, SAS
Title: Combining Data and Instruction Level Parallelism through Demand Driven Execution of Imperative Programs
Sponsor: National Science Foundation
Amount of Support: \$560,000
Duration of Support: Four-year collaborative project with FSU with a total budget of \$875,000

Sponsors



Research Grants cont'd

PI: Min Song, CyberS

Title: The Ontology of Inter-Vehicle Networking with Spatio-Temporal Correlation and Spectrum Cognition

Sponsor: National Science Foundation

Amount of Support: \$221,797

Duration of Support: Three-year collaborative project with NC State with a total budget of \$495,414

PI: Min Song, CyberS and Zhaohui Wang, CPS

Title: Under-Ice Mobile Networking: Exploratory Study of Network Cognition and Mobility Control

Sponsor: National Science Foundation

Amount of Support: \$299,716

Duration of Support: Two years

PI: Keith Vertanen, HCC

Title: Less is More: Investigating Abbreviated Text Input via a Game

Sponsor: Google Faculty Research Award

Amount of Support: \$47,219

Duration of Support: One year

PI: Leo Ureel, Co-PI, HCC

Title: Agile Communicators: Preparing Students for Communication-Intensive Software Development through Inquiry, Critique and Reflection

Sponsor: National Science Foundation

Amount of Support: \$218,735

Duration of Support: 3 years

PI: Xinli Wang, CyberS

Title: ITSEED: Active-Learning Laboratory Experiments for IT Security Education

Sponsor: National Science Foundation

Amount of Support: \$199,934

Duration of Support: 4 years

PI: Xiaohua Xu, CyberS

Title: Optimal Joint Spectrum Allocation and Scheduling for Cognitive Radio Networks

Sponsor: National Science Foundation

Amount of Support: \$244,808

Duration of Support: 2 years

Researcher Spotlight



Researcher: Laura Brown (DataS)

Two active grants sponsored by the National Science Foundation

Title: CSR: Small: Collaborative Research: Adaptive Memory Resource Management in a Data Center -A Transfer Learning Approach

Amount of Support: \$299,993

Duration of Support: Three years

Co-PI: Zhenlin Wang (SAS)

Title: A Controls Approach to Improve How Society Interacts with Electricity

Amount of Support: \$699,796

Duration of Support: Three years

Co-PIs: Chee-Wooi Ten (CPS) and Wayne Weaver



Researcher: Zhuo Feng (SAS)

Three active grants sponsored by the National Science Foundation

Title: SHF: Small: Scalable Spectral Sparsification of Graph Laplacians and Integrated Circuits

Amount of Support: \$450,000

Duration of Support: Three years

Title: Graph Sparsification Approach to Scalable Parallel SPICE-Accurate Simulation of Post-layout Integrated Circuits

Amount of Support: \$250,701

Duration of Support: Three years

Title: CAREER: Leveraging Heterogeneous Manycore Systems for Scalable Modeling, Simulation and Verification of Nanoscale Integrated Circuits

Amount of Support: \$400,000

Duration of Support: Five years

Travel Grants



Researcher: Zhaohui Wang, CPS

Sponsor: National Science Foundation

Amount of Support: \$25,000

Grant Title: NSF Student Travel Grant for 2016 IEEE International Conference and Computer Communications (IEEE INFOCOM)

This grant supported 25 graduate students based in the United States to attend IEEE INFOCOM 2016. The travel awards targeted graduate students, in particular women and under-represented minority students. Priority was given to the students who substantially benefited from attending the conference but had limited travel funds.

Awards

PhD Student: Maryam Fakh Hosseini

Department: Applied Cognitive Science and Human Factors

Advisor: Philart Jeon

Award: Outstanding Scholarship Award from the Dean of Graduate School in Spring 2016

Researcher: Shiyan Hu, SAS

Award: ACM Distinguished Speaker

ACM is the world's largest educational and scientific computing society with nearly 40 special interest groups (SIGs) which all together share an ACM Distinguished Speaker Program. The program recognizes a very small group of leading experts across all disciplines within ACM and sponsors them for their distinguished lectures worldwide. Currently, only about 0.1% ACM members are named distinguished speakers and each distinguished speaker serves a three-year term.

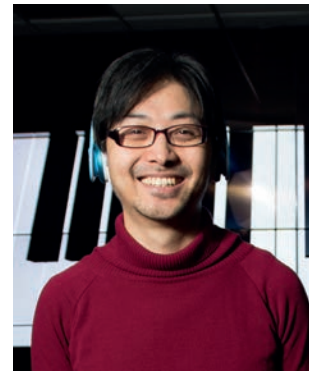
Researcher: Philart Jeon, HCC

Award: Best Paper Award at the ArtsIT 2016 Conference

Paper Title: Aesthetic Computing for Representation of the Computing Process and Expansion of Perceptual Dimensions: Cases for Art, Education and Interfaces

Researcher: Zhaohui Wang, CPS

Award: Outstanding Service Award at WUWNet (10th ACM International Conference on Underwater Networks & Systems)

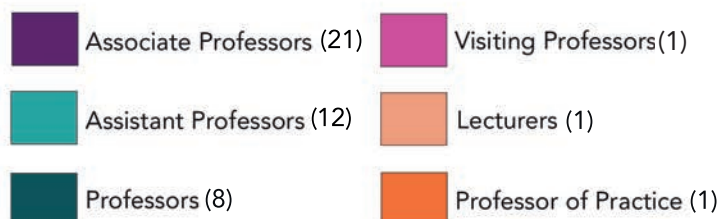
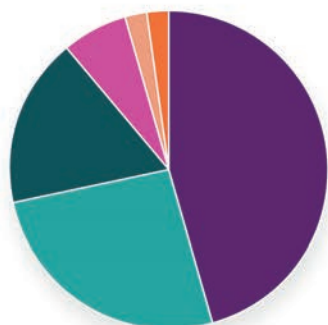


Philart Jeon, HCC

Promotions

Three ICC members received promotions this spring. Laura Brown (DataS), Philart Jeon (HCC), and Timothy Havens (DataS) were promoted to Associate Professor with tenure.

Distribution of Rank among Members



Recognitions



Nina Mahmoudian (CPS) was selected by *Diverse: Issues in Higher Education* magazine as a 2016 Emerging Scholar for her work with underwater robots, specifically, making them accessible for education and research. This is the magazine's 15th annual special report on early career outstanding scholars.

Last year Nina was also invited to join the Young Investigator Program (YIP) from the Office of Naval Research, a prestigious honor that only 36 faculty across the US receive. She also received the CAREER Award from the National Science Foundation (NSF). She is one of a select few to receive both in the same year.

Society Leadership

Shiyan Hu (CPS) served as one of the Founding Co-Chairs for the first technical committee related to Cyber-Physical Systems (CPS) across all IEEE societies, the IEEE Technical Committee on Cybernetics for Cyber-Physical Systems. This new technical committee aims at promoting interdisciplinary research and education in the field of CPS.

Min Song (CyberS) has been appointed the Institute of Electrical and Electronics Engineers (IEEE) Communications Society Director of Conference Operations for 2016-2017. The IEEE Communications Society promotes the advancement of science, technology and applications in communications and related disciplines. It fosters presentation and exchange of information among its members and the technical community throughout the world. The Society maintains the highest standard of professionalism and technical competency.



Additional Leadership

Bo Chen

Associate Editor, IEEE Transactions on Intelligent Transportation Systems

Timothy Havens

Associate Editor, IEEE Transactions on Fuzzy Systems

Shiyan Hu

ACM Distinguished Speaker
EiC, IET Cyber-Physical Systems: Theory & Application
Associate Editor, IEEE Trans. on CAD
Associate Editor, IEEE Trans. on Industrial Informatics
Guest Editor, IEEE Trans. on Computers
Guest Editor, IEEE Trans. on Big Data

Chee-Wooi Ten

Editor, IEEE Transactions on Smart Grid
Editor, Elsevier Journal Sustainable Energy, Grids and Networks (SEGAN)

Min Song

Member, INFOCOM Standing Committee
TPC Vice-Chair, GLOBECOM 2015
General Chair, INFOCOM 2016
EiC, EAI Transactions on Wireless Spectrum
Editor, Journal of Computer Networks

Philart Jeon

Associate Editor, MIT Presence: Teleoperations and Virtual Environments
Guest Editor, MIT Journal Presence Special Issues on "Arts, Aesthetics, and Performance in VR and Telepresence"

Keith Vertanen

Associate Editor, International Journal of Human Computer Studies
Associate Chair, IUI 2015, MobileHCI 2014
Associate Chair for CHI 2017

Events

NSF Proposal Writing Panel

On April 22 the ICC hosted an NSF Proposal Writing Panel Discussion. The panel included Michigan Tech faculty who have sat on NSF panels and have insight on the art and technique of writing a proposal for an NSF grant. The panel consisted of the following ICC members: Laura Brown (DataS), Nina Mahmoudian (CPS), Soner Onder (SAS), Chee-Wooi Ten (CPS) and Xinli Wang (CyberS). Durdu Guney, from Michigan Tech's Department of Electrical and Computer Engineering was a guest panelist.

Distinguished Lecturer Series

The ICC brings the most eminent scholars and creative professionals in the field of computing to the campus to exchange state-of-the-art research results and discuss future research directions.

Past Lectures

September 2015 - Weisong Shi, Charles H. Gershenson Distinguished Faculty Fellow and a Professor of Computer Science at Wayne State University, presented "Toward Energy-Efficient Computing."

September 2015 - Yale Patt, Professor of ECE and the Ernest Cockrell, Jr. Centennial Chair in Engineering at The University of Texas at Austin, presented "The END of X, the BEGINNING of Y and What it Means for the Microprocessor of 2025."

October 2015 - Todd Austin, Professor of Electrical Engineering and Computer Science at the University of Michigan in Ann Arbor, presented "On the Rules of Low-Power Design (and Why You Should Break Them.)"

November 2015 - Amy Apon, Program Director, National Science Foundation, presented "Experimental Computer Science."



Select Conference Activities

Philart Jeon (HCC) attended ArtsIT 2016 Conference at Aalborg University, Denmark and received the Best Paper Award.

Min Song (CyberS) attended the IEEE Communication Society Board of Governors meeting at Kuala Lumpur, Malaysia. The meeting was held in conjunction with IEEE International Conference on Communications.

Min Song (CyberS) attended IEEE INFOCOM 2016 in San Francisco in early April. Min acted as General Chair of the conference.

Shiyan Hu (CPS) attended IEEE INFOCOM 2016 and led a workshop entitled, "Cross-Layer Cyber-Physical Systems Security (CPSS)".

Saeid Nooshabadi (SAS) delivered a tutorial at NEWCAS 2016 conference in Vancouver, BC on "Development of Massively-Parallel Multimedia Algorithms and Applications in the Integrated Multi-Core/GPU Platform".

Soner Onder (SAS) served on International Symposium on Computer Architecture (ISCA2016) Program Committee.

Keith Vertanen (HCC) held a workshop at the ACM Conference on Human Factors in Computing Systems (CHI 2016). The workshop was titled "Inviscid Text Entry and Beyond".

Financial Reporting

ICC Year One (July 2015- June 2016) Performance

Research Activities	Year One Goals	Year One Results
New Research Awards	1.6M	3.7M
Pre-Existing Awards Moved to ICC	-	590K
Research Expenditures	1.6M	1.4M
Number of New Research Awards Received	6	13
Number of Proposals Submitted	35	32
External Visibility	Year One Goals	Year One Results
Conferences/Workshops Organized	4	7
DLS Talks Organized	8	4
Demos Organized	2	3
Publications	100	150+
Leadership Roles in Technical Committees, Journal Editors and Conference Chairs	6	16
Keynote Talks	1	-
Invited Talks	4	2
Students Supported	15	32 (23 Full-time)

ICC 5-Year Plan

Research Activities	Year 1	Year 2	Year 3	Year 4	Year 5	Total
New Research Awards	1.6M	1.9M	2.2M	2.5M	2.8M	11.0M
Research Expenditures	1.6M	1.7M	1.9M	2.2M	2.6M	10.0M
Number of New Research Awards Received	6	7	8	9	10	40
Number of Proposals Submitted	35	37	40	43	47	202
External Visibility	Year 1	Year 2	Year 3	Year 4	Year 5	
Conferences/Workshops Organized	4	5	6	7	8	30
DLS Talks Organized	8	10	12	14	16	60
Demos Organized	2	3	4	5	6	20
Publications	100	110	120	130	140	600
Leadership Roles in Technical Committees, Journal Editors and Conference Chairs	6	10	12	15	20	52
Keynote Talks	1	1	1	1	1	5
Invited Talks	4	4	4	5	5	22
Students Supported	15	18	21	24	27	105

IRAD and Seed Fund Usage

Each center received a \$15K Start-Up package in addition to receiving 15% of their IRAD funds. Center directors and members decide how to use the funds to promote their center's strategic development and members' growth.

Currently, funds are being used in several different ways. First, funds are being used to support students—23 full-time and 9 part-time. Lab equipment has also been purchased, including two 12-core workstations for the Computer System Lab. And lastly, the money is being used to support the development of new research projects.

Gift funds from Michigan Tech alumnus Paul Williams will be used to support future seed projects via an internal competitive proposal process.

Research Projects in Development

PI: Keith Vertanen

Plausible Sponsor: National Science Foundation

Title: Indoor Rock Climbing for Blind People

PI: Tejin Yoon

Co-PIs: Philart Jeon, Shane Mueller

Submitted to: National Institutes of Health

Title: Effectiveness of a Home-based Resistance Training with Wearable Motion Tracking System

PI: Scott Kuhl (PI),

Co-PIs: Leo Ureel, Philart Jeon

Title: HMDs to Support Research, Education, and Outreach

PI: Leo Ureel

Title: Robotics to Develop a Lab Module for CS 1131 and CS 1121



ICC Leadership



Min Song
Director



Daniel R. Fuhrmann
Co-Director



Timothy Havens
ICC Associate Director,
Center Director,
DataS



Guy Hembroff
ICC Associate Director,
Center Director,
CyberS



Shiyan Hu
ICC Associate Director,
Center Director,
CPS



Philart Jeon
ICC Associate Director,
Center Director,
HCC



Saeid Nooshabadi
ICC Associate Director,
Center Director,
SAS

Select Publications

Cyber-Physical Systems

S. Paudyal and R. Gokaraju, "Out-of-Step Protection for Multi-Machine Power Systems Using Local Measurements," *IEEE PowerTech*, Eindhoven, The Netherlands, April 2015.

Y. Liu, S. Hu, and T. Ho, "Leveraging Strategic Detection Techniques for Smart Home Pricing Cyberattacks," *IEEE Transactions on Dependable and Secure Computing*, vol. 13, no. 2, March 2016.

B. Chen, C. Cao, and M. Cheng, "Optimal Scheduling of PEV Charging/Discharging in Microgrids with Combined Objectives," *Smart Grid and Renewable Energy*, April 2016.

Cyber-Security

G. Hembroff, "Improving Patient Safety, Health Data Accuracy, and Remote Self-management of Health through the Establishment of a Biometric-based Global UHID," *Proc. of Global Telehealth Conference (GT'16)*, 2016.

P. Akula, M. Mahmoud, K. Akkaya, and M. Song, "Privacy-Preserving and Secure Communication Scheme for Power Injection in Smart Grid," *Proc. of IEEE SmartGridComm*, 2015.

Y. Bai and X. Wang, "Teaching offensive security in a virtual environment," *Journal of Computing Sciences in Colleges ACM*, vol. 31, no. 1, pp. 140-14, October 2015.

Data Sciences

C. Demars, M. Roggemann, and T.C. Havens, "Multi-spectral detection and tracking of multiple moving targets in cluttered urban environments," *Optical Engineering*, vol. 54, no. 12, p. 123106, December 2015.

I. Brown, L. Brown, and G. Sizov, "Impact of Interior Permanent Magnet Rotor Design on Signal Injection Based Sensorless Control and Power Conversion," *IEEE Transactions on Industry Applications*, Accepted for publication, 2015.

S. Kumari, W. Deng, C. Gunasekara, V. Chiang, H.S. Chen, H. Ma, X. Davis, and H. Wei, "Bottom-up GGM algorithm for constructing multilayered hierarchical gene regulatory networks that govern biological pathways or processes," *BMC Bioinformatics 2016*, vol. 17, no.132, 2016.

Human-Centered Computing

K. Vertanen, H. Memmi, J. Emge, S. Reyat, and P. Kristensson, "VelociTap: Investigating Fast Mobile Text Entry using Sentence-based Decoding of Touchscreen Keyboard Input," in *Proc. CHI '15, ACM Conference on Human Factors in Computing Systems*, Seoul, Korea, April 2015.

M. Jeon, T. Gable, B. Davison, M. Nees, J. Wilson, and B. Walker, "Menu navigation with in-vehicle technologies: Auditory menu cues improve dual task performance, preference, and workload," *International Journal of Human-Computer Interaction*, vol. 31, no. 1, pp. 1-16, 2015.

S. Kumari, W. Deng, C. Gunasekara, V. Chiang, H.S. Chen, H. Ma, X. Davis, and H. Wei, "Bottom-up GGM algorithm for constructing multilayered hierarchical gene regulatory networks that govern biological pathways or processes," *BMC Bioinformatics 2016*, vol. 17, no.132, 2016.

Scalable Architectures and Systems

A. Klinkhamer and A. Ebnenasir, "Shadow/Puppet Synthesis: A Stepwise Method for the Design of Self-Stabilization," *IEEE Transactions on Parallel and Distributed Systems*, Accepted for publication, 2016.

X. Zhao, L. Han, and Z. Feng, "A Performance-Guided Graph Sparsification Approach to Scalable and Robust SPICE-Accurate Integrated Circuit Simulations," *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, vol. 34, no. 10, pp. 1639-1651, October 2015.

X. Hu, X. Wang, Y. Li, L. Zhou, Y. Luo, C. Ding, and Z. Wang, "Kinetic Modeling of Data Eviction," *Proc. USENIX Annual Technical Conference (ATC'16)*, Denver, CO, June 2016.

For a complete list go to: <http://icc.mtu.edu/publications>

