## **Final Program**

# 49<sup>th</sup> Annual Midwest Instruction and Computing Symposium





### Department of Computer Science

### April 22 - 23, 2016

Thanks to Our MICS 2016 Sponsors!





MICS Registration opens at 12:00 (noon) in the Lounge Area on the west-side of the 100 Level (one floor above the ground floor) of ITTC (Innovative Teaching Technology Center)

**Friday Parking:** Use the "Pay by Stall" parking in the Multimodal Transportation Center ramp (see map below). Sorry, but you will need to pay for parking. On Saturday you may park in any A or B lot for free.



Technical Session I 1:00 – 2:00 PM

<b>ITTC 28</b>	Security	Session Chair: Terry Letsche
1:00	A Novel Multi-touch Authentication Scheme for	Dicheng Wu and Mengyu Qiao
	Mobile Devices	
1:30	Developing a Mobile App that Uses the Routing Cache	Laura Lebentritt, Raqeeb Abdul and
	Table to Detect Brute Force Secure Shell Attacks Not	Dennis Guster
	Detected by the Intruder Detection System	

<b>ITTC 29</b>	Algorithm Complexity	Session Chair: Andrew Anda
1:00	Developing a Memory Efficient Heuristic Algorithm	Nathaniel Hayes and Teig Loge
	for Playing <i>m</i> , <i>n</i> , <i>k</i> Games	
1:30	Comparison of (0,1)-Matrix-Vector Product	Jeffrey Witthuhn and Andrew Anda
	Difference-Based Algorithms	

ITTC	Faculty Birds-of-Feather	Session Chair: Mark Hall
134/136		
1:00 - 2:00	<ul> <li>Suggested Topics:</li> <li>1) Pedagogy: Lecture, Flipped-classroom, On-line</li> <li>2) Enrollment, Retention, Faculty Hiring in Comp</li> <li>3) Future of MICS</li> </ul>	e instruction, etc. uter Science

<b>ITTC 322</b>	Mobile Interfaces	Session Chair: Mao Zheng
1:00	User Interface Adaption in Android Device for	Qian Xu, Sihan Cheng and Mao Zheng
	Orientation Change	
1:30	Use of a Decision Tree to Represent Context	Sihan Cheng, Qian Xu and Mao Zheng
	Information	

<b>ITTC 328</b>	Robotics Contest Practice Board
1:00 - 3:30	A practice board and map are available to share.

#### **Break, Career Fair, and Posters/Demonstrations in Lounge Area** on 100 Level of ITTC

Demonstration	OnRamp to Parallel and Distributed Computing	Samantha S. Foley, Dan Koepke,
ITTC 146A		Christa Brehm, Justin Ragatz and
(N. Balcony)		Jason Regina
Poster	Reinforcement Learning for Advanced Board Game AI	Derek Stotz and Larry Pyeatt
Poster	Meteorological Visualization using MATLAB and a	Joseph Kelzenberg and Mark
	Gaming Engine	Petzold
Poster	Recommender Systems Using Cluster Analysis on	Hope Haugstad
	Semantic Tag Data	Hope Haugstad
Poster	Digital Notes for Students with Disabilities	Bennett Carson

Technical Session II

2:30 – 3:30 PM

Friday, April 22

<b>ITTC 28</b>	Stochastic and Quantum Computing	Session Chair: Dennis Guster
2:30	Application of Heston's Stochastic Volatility Approach in Numerical Computation of the European Options: Preliminary Design	Paul Ryan, Shivam Soni, Renat Sultanov and Dennis Guster
3:00	A Hybrid Quantum Encryption Algorithm that Uses Photon Rotation to Insure Secure Transmission of Data	Karthik Paidi, Anthony Kunkel, Dennis Guster, Renat Sultanov and Erich Rice

<b>ITTC 29</b>	Image Processing	Session Chair: Noel Petit
2:30	Novel Feature Based Outlier Rejection	Daniel Nix and Jeff McGough
3:00	Apparent Depth in a 3 Dimensional Model Using Techniques in Stereoscopic Rendering and Depth of Field Effect	Mason Stilwell, Jack Hamby and Conrad Parker

ITTC	Computer Science Education	Session Chair: Thomas O'Neil
134/136		
2:30	Towards Math Integration in the Computer Science and	Donald Heier, Mary Reed, Erik Sand
	Technology Curriculum	and Kathryn Lemm
3:00	0/1-Knapsack vs. Subset Sum: A Comparison using	Thomas O'Neil
	Algolab	

<b>ITTC 322</b>	Miscellaneous Algorithms	Session Chair: Derek Riley
2:30	0-1 Knapsack Optimization with Branch-and-Bound	Christopher Hanson and Salem
	Algorithm	Hildebrandt
3:00	Using Data Mining in Combination with Machine	Michael Fischer and Derek Riley
	Learning to Enhance Crowdsourcing of a Formal	
	Model of Biodiesel Production	

<b>ITTC 328</b>	Robotics Contest Practice Board
1:00 -	A practice board and map are available to share.
3:30	

# 4:00-5:30 PM MICS Robotics Contest and Pizza Party in SWT 5:45 – 6:15 PM Programming Contest Instructions in SWT 6:30 – 9:30 PM MICS Programming Contest in Wright Hall

#### MICS 2016 Robotics Contest: Mini-Mini-Golf

The MICS 2016 robot contest will consist of a 3-hole miniature golf course. Before playing a hole, the robot may "look" at (or even run upon) a scaled down (quarter-sized) map of the hole for up to 3 minutes. The map will indicate the recommended robot route from tee to hole via a red line. Immediately after looking at the map, a robot will have 3 minutes to play the corresponding hole by hitting a real golf ball (white in color). A robot's score for the hole is the number of hits to move the golf ball from tee to the hole, plus any penalty strokes for illegal play (e.g., pushing the golf ball too far instead of hitting it). A robot's total score over all three holes will determine its place. For the leaders, tiebreaker hole(s) will be played until ties are broken.

Each hole will be made from a 4'x8' sheet of plywood that is covered with green indoor/outdoor carpet. The plywood will be as level as possible, i.e., not tilted. The hole will be completely enclosed by 2"-by-4" lumber so they are about 3.5" tall. Obstacles on the course will be constructed out of 4"x 4" (or screwed together 2"x4"s) lumber. All walls and obstacles are painted flat black. Each hole has between 0 to 3 obstacles.



The corresponding quarter-size map is 12"x24" and would look something like:



#### **Rules:**

- 1. The objective of the contest is to design an **autonomous** robot that can play miniature golf after "looking at" (or even running upon) a map of the hole (as described above). A robot's score for the hole is the number of hits to move a golf ball from the tee to touch the "hole", plus any penalty strokes for illegal play. **The maximum score for a successfully completed hole is 15.** A robot's total score over all three holes will determine its place. For the leaders, tiebreaker hole(s) will be played until ties are broken (starting again at the map for hole 1 and hole 1).
- 2. A robot is allowed 3 minutes to "look at" or run upon the map before playing the corresponding hole.
- 3. A robot is allowed a maximum of 3 minutes to play a hole. If they do not complete a hole in 3 minutes or their score on a hole reaches 16, then their score for that hole is 16.
- 4. A robot receives one stroke every time it hits the ball. A hit is defined to be anytime the ball goes from touching to not touching the robot. The ball will be a standard white golf ball.
- 5. A robot incurs a penalty stroke any time it continually pushes (or remains in contact with) the ball and the ball moves farther than 4 inches. If a robot pushes the ball farther than 4 inches it incurs a penalty for each increment of 4 inches and 1 stroke for a hit. For example, if a robot pushes the ball while remaining in contact with it for 10 inches, then the robots score will go up by 2 penalties and 1 hit. A robot can incur a penalty stroke any time the ball moves 4 inches while in contact with the robot -- even while positioning the ball for the next hit. (Warning: The distances will be a judgement call, and remember that the judge is always right by definition. Arguing with the judge could get you eliminated from the completion!)
- 6. At the start of a hole, a robot must be touching the carpet in at least one spot within the white tee box. A robot does not need to be entirely within the tee box. The team may point the robot in any direction, and must position the golf ball on the carpet so that it is within an inch of the robot. A robot may start with the golf ball touching the robot.
- 7. A hole is successfully completed when the golf ball touches any part of the "hole"/cup. If the robot is in contact with the ball when the hole is completed, an additional stroke is incurred.

#### 4:00-5:30 PM MICS Robotics Contest and Pizza Party in SWT 5:45 – 6:15 PM Programming Contest Instructions in SWT 6:30 – 9:30 PM MICS Programming Contest in Wright Hall

<b>ITTC 28</b>	Machine Learning	Session Chair: Timothy Urness
8:30	Identifying Splice Sites Of Messenger RNA Using	Paige Diamond, Zachary Elkins, Kayla
	Support Vector Machines	Huff, Lauren Naylor, Sarah
		Schoeberle, Shannon White, Timothy
		Urness and Matthew Zwier
9:00	Creating a Difficulty Metric for A Sudoku Variation	Emily Alfs

<b>ITTC 29</b>	Image Processing	Session Chair: Stuart Hansen
8:30	Invisible Display: Reverting Color Distortion in a Camera-Display System Using Color Mapping and Barycentric Interpolation	Abdel-Rahman Madkour, Margaret Connell and John Stone
9:00	Specularity Replacement in a Contour in a Single Image	Stephen Akers, Nadia El Mouldi and Thomas Weihe

ITTC 134/136	Web App	Session Chair: Derek Riley
8:30	Web-Based Mobile Display of 3D Models	Elijah Verdoorn, Joe Peterson and Austin Pejovich
9:00	Development of a Multi-Tenant Web Application into a Software Product Line for Transit System Schedule Management	Michael Carey and Derek Riley

<b>ITTC 322</b>	Networking	Session Chair: Shaun Lynch
8:30	Making Progress on IPv6: New Insights after an IPv4-	Shaun Lynch
	IPv6 Dual-Stack Deployment	
9:00	Deploying a Virtualized Network Infrastructure in an	Shaun Lynch
	Academic Computing Environment	

<b>ITTC 328</b>	Programming Languages	Session Chair: Elena
		Machkasova
8:30	Designing a Comparative Usability Study of Error	Henry Fellows, Sean Stockholm,
	Messages	Thomas Hagen and Elena Machkasova
9:00	Examining The Prevalence and The Historical Trends	Saleh Alnaeli and Melissa Sarnowski
	of Indirect Function Calls in Open Source Systems: A	
	Case Study, gcc 2001-2011	

#### 9:30 – 10:00 Break in Lounge Area on 100 Level of ITTC

Technical Session IV

10:00 – 11:00 AM

Saturday, April 23

<b>ITTC 28</b>	Miscellaneous	Session Chair: Sean Stahly
10:00	Educational Experiences in Building a Custom UAV	Sean Stahly and John Hastings
10:30	Camera Calibration and Optimization for Indoor Location	Tianyu Pang, Nathan Maveus and Soren Bjornstad

<b>ITTC 29</b>	Neural Networks	Session Chair: Scott Kerlin
10:00	Performing Semantic Segmentation on an Extremely	Rodney Lalonde, Hao Du, Ryan van
	Small Dataset	Mechelen and Skylar Zhang
10:30	Using Neural Networks to Detect Examples of Ad	Jordan Goetze
	Hominim in Politics and Microblogging Platforms	

ITTC	Image Processing & Computer Vision	Session Chair: Jeff McGough
134/136		
10:00	Using Computer Vision to Assist the Scoring of	Stephanie Athow and Jeff McGough
	Modern Fencing	
10:30	Refining 3D Reconstruction Of Stereo Camera Images	Jacob Forster, Joseph Jung and
	With Least Squares	Andrew Turnblad

<b>ITTC 328</b>	Computer Science Education Pedagogy	Session Chair: Sherri Harms
10:00	ARM Cluster: A Research Tool	Christine Sorensen, Andrew Hoover and Christer Karlsson
10:30	Enabling Student Innovation through Virtual Reality Development	Sherri Harms

#### 11:15-1 PM Keynote, Awards, and Lunch, and in MSH Keynote 11:15 in McCollum Science Hall (MSH on map) Lantz Auditorium

#### Keynote: Dr. Sarah Diesburg



Dr. Sarah Diesburg is an Assistant Professor at the University of Northern Iowa. Her research interests address security and privacy on electronic storage, where she is published in multiple conferences and journals. She received her Ph.D. in Computer Science in 2012 from Florida State University, her M.S. degree in Information Assurance in 2008 from Florida State University, and her B.S. degree in Computer Science in 2004 from the University of Northern Iowa.

Title: Ghosts of Deletions Past: New Research and Challenges in Securely Deleting Your Data

Before leaving, please turn in your conference evaluation in the boxes by the Auditorium doors!