

45th Annual Midwest Instruction and Computing Symposium 2012

(MICS 2012)

**Cedar Falls, Iowa, USA
13-14 April 2012**

ISBN: 978-1-62276-069-5

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2012) by the Midwest Instruction & Computing Symposium
All rights reserved.

Printed by Curran Associates, Inc. (2012)

For permission requests, please contact the Midwest Instruction & Computing Symposium
at the address below.

Midwest Instruction & Computing Symposium
University of Wisconsin
204E North Hall
410 S 3rd St.
River Falls, WI 54022

Phone: (715) 425-0660
Fax: (715) 425-0657

Mary-alice.muraski@uwrf.edu

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

TECHNICAL SESSION I

ARTIFICIAL INTELLIGENCE APPLICATIONS

Augmented Reality Using a Neural Network	1
<i>Pye Phyo Maung</i>	
Approximating Missing Results Using an Artificial Neural Network	17
<i>Tyler Kostuch, Trent Thomas, Tim Julius, Jayson Walberg, Josette Staples, David Block, Francois Neville</i>	
Augmenting Crowd-sourcing Techniques with Artificial Intelligence	32
<i>Travis Archer</i>	

3D MODELING AND COMPUTER VISION

3D Modeling in Blender Based on Polygonal Data	43
<i>James Ribe, Alora Killian, Daniel Anderson</i>	
Polygon-Based Stereo Matching Using Normalized Cross Correlation	50
<i>Bjorn Mellem, Francois Guiot</i>	
An Exploration of Surface Detection in Stereo Vision	58
<i>Matt Blanchard, Cody Gronseth, Jon Sandness</i>	

EDUCATIONAL TECHNOLOGY

Development Systems: A Review	66
<i>Curt Hill</i>	
Moodle Integrated Command Structure	79
<i>Don Gable</i>	
Student-Owned Devices for Classroom-wide Communication and Collaboration	90
<i>J. Ben Schafer, Stephen Hughes</i>	

MISC.: VIDEO GAME DEVELOPMENT & 3D-DISPLAY TECHNOLOGY

The Creation of a Bullet Hell Game Engine	105
<i>Curtis Mackie</i>	
FPGArcade: Motivating the Study of Digital Hardware	115
<i>Thomas Griebel, Nicholas Burek</i>	
A Qualitative Analysis of 3D Display Technology	116
<i>Mary Scaramuzza, Shane Nelson, Nicholas Blackhawk</i>	

TECHNICAL SESSION II

GENETIC ALGORITHMS

Genetic Algorithms in College and University Housing	122
<i>Chris Craven</i>	
LandscapeEC: Comparing 2D to 3D Cellular Evolutionary Algorithms	136
<i>Nicholas Cornhill, Nicholas Freitag McPhee</i>	
Optimization of Tile Sets for DNA Self-Assembly	146
<i>Joel Gawarecki, Adam Smith, Jaris Van Maanen, Linsey Williams</i>	

MOBILE APPLICATIONS

Architecture Design to Support a Smartphone-based Student Response System	156
<i>Alexander Preston, Aaron Mangel, Stephen Hughes, Ben Schafer</i>	
Location-Based Services Design and Implementation Using Android Platforms	161
<i>Wen-Chen Hu, Naima Kaabouch, Hung-Jen Yang, Ather Sharif</i>	
An Android-based Instant Message Application	177
<i>Qi Lai, Mao Zheng, Tom Gendreau</i>	

COMPUTER SCIENCE EDUCATIONAL TOOLS

Experiences with a UML Diagram Critique Tool	187
<i>Robert W. Hasker, James Reid, Andrew Rosene</i>	
Test Case Generation from UML Models	201
<i>Yiwen Wang, Mao Zheng</i>	
Reshaping Curriculum Design from Concept to Assessment through Technology Driven Methodologies	210
<i>Washington Helps, Emanuel Grant</i>	

COMPUTER SYSTEMS

Rebuilding an Academic Network Infrastructure Employing Virtualization and Failover Clustering	225
<i>Shaun Lynch</i>	
Using Node and Batch Analysis to Efficiently Render Animations	238
<i>Robert Foertsch, Brian Slator</i>	
Configuring and Tuning a Distributed Computer System to Support Complex Molecular Simulation: Phase I Collecting Performance Metrics	251
<i>Medina Sultanova, Jake Soenneker, Dennis Guster</i>	

TECHNICAL SESSION III

ALGORITHMS

Three Approaches to Solving the Motif-Finding Problem	260
<i>Zachariah Huebener, Kylie Van Houten</i>	
AIRS: Anytime Iterative Refinement of a Solution	270
<i>Sam Estrem, Kurt Krebsbach</i>	
The Prospects for Sub-Exponential Time	283
<i>Thomas O'Neil</i>	

3D MODELING AND CAMERAS

Stereo Image Capture and Interest Point Correlation for Interior 3D Modeling	292
<i>Eileen King, Tommy Markley, Andrew Crocker</i>	
Refinement of Plane Based Calibration Through Enhanced Precision of Feature Detection	298
<i>Rogan Magee, Jared Brown, Leah Roth</i>	
Creating Panoramic Images: A Hardware Comparison Between Sony BRC-300 and EVI-HD1 Cameras	313
<i>Chris Cornelius, Charles Nye, Ian McGinnis</i>	

COMPUTER SCIENCE EDUCATION

Western Technical College and University of Wisconsin - La Crosse 2+2 Computer Engineering Technology-Computer Science Program	324
<i>Jeff Fancher, Thomas Gendreau</i>	
A Grand, Unified Project: Doane SuDoKu	331
<i>Mark Meysenburg</i>	

Transforming the Curriculum with Big Data: The Need for Data Resources in the Computer Science Curriculum	342
<i>Brandon Olson, Thomas Gibbons</i>	

SECURITY

Security Strategies for a Web-Based Peer Review System	349
<i>Zachary Forster, Isaac Schemm, David Spiegel, Matthew Wisby, Joline Morrison, Mike Morrison</i>	
Network Security: A Case Study	360
<i>Susan Lincke</i>	
Using the Strombringer System Tool Suite to Test for Vulnerabilities in a University Research and Development Autonomous System	366
<i>Dimitri Podkorytov, Dennis Guster, Jake Soenneker</i>	

TECHNICAL SESSION IV

ARTIFICIAL INTELLIGENCE APPLICATIONS

Chess AI	377
<i>Ahmet Erciyas</i>	
Iterative-Expansion A*	383
<i>Colin Potts, Kurt Krebsbach</i>	
EnMAS: A New Tool for Multi-Agent Systems Research and Education	395
<i>Connor Doyle, Martin Allen</i>	

MISC. COMPUTER SCIENCE EDUCATION

Database Systems Course: Service Learning Project	409
<i>Sherri Harms</i>	
The Kiwi Project Revisited: Promoting Student Learning Through Community Involvement	424
<i>Tom Stokke, Kaden Daley</i>	
Affordable USB Forensics	430
<i>Philip Polstra</i>	

NOVEL COMPUTER SCIENCE COURSES

Evaluating the Use of Flowchart-based RAPTOR Programming in CS0	441
<i>Michael Thompson</i>	
Three-phase Motor Control in a Real-Time Embedded Systems Programming Course	451
<i>Joseph Clifton</i>	
Teaching Mobile Computing Using Proof-of-Concept and Studio-based Instruction	466
<i>Stephen Hughes</i>	

MISC. JAVA PROGRAMMING LANGUAGE

Improving the Interoperability between Java and Clojure	477
<i>Stephen Adams</i>	
The Role of Method Call Optimizations in the Efficiency of Java Generics	487
<i>Jeffrey Lindblom, Seth Sorensen, Elena Machkasova</i>	
Java Wiki Integrated Development Environment	502
<i>Mark Hall</i>	

WEB SERVICES

Fuzzy Web Information Retrieval System	503
<i>Joseph Lee, Eunjin Kim</i>	

Rewriting an Antarctic Research Data Pipeline	513
<i>Brian Dawn, Noel Petit</i>	
Java & Video: Install Once, Play Everywhere	519
<i>Jack Spirou, Erik Steinmetz, Wojciech Komornicki, Noel Petit</i>	
Author Index	