Midwest Instruction and Computing Symposium

41st Midwest Instruction and Computing Symposium

MICS 2008

April 11-12, 2008
La Crosse, Wisconsin, USA

Printed from e-media with permission by:

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

ISBN: 978-1-60560-365-0

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

© Copyright 2008 by the Midwest Instruction and Computing Symposium

Copyright 2008 by the Midwest Instruction and Computing Symposium. Permission to make printed or digital copies of all or part of this material for educational or personal use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies include this notice and the full citation on the first page.

Table of Contents

Undergraduate Research

- **Interdisciplinary Undergraduate Research in the CS Curriculum** 1
  D. Brown, D. Guster, B. Jansen (St. Cloud State University)
- **Creating Visions for Computing Research**....13
  K. Sutherland (Augsburg College)

Pedagogical Techniques

- **Using Clickers to Enhance Computer Science Classes**....18
  J. Morrison (University of Wisconsin-Eau Claire)
- **Grafting Technology onto Disciplinary Courses**....29
  B. Bultman (University of Wisconsin-Fox Valley)
- **The Root Causes of the Students' Programs Quality Improvement in the TBC Method** 42
  Shawon Rahman (University of Wisconsin-Platteville)

Algorithms

- **Randomly Generating Well-Formed Postfix Expressions** 54
  A. Ng (University of Wisconsin-Parkside)
- **Automated Process for Classifying Text Documents using K-Means and kNN** 64
  M. Evans, M. Lietzke, S. Huls, D. Svendsen (Saint John's University)
- **Sectioning Points into Fixed-Size Sections**....79
  D. Edwins, L. Schlather, O. Hall-Holt (St. Olaf College)

Computing Architectures

- **Enhancing the Price/Performance for a Clustered Multiprocessor System**....84
  J. Myre, D. Ernst (U. of Wisconsin-Eau Claire)
- **Performance Evaluation of Java RMI in Parallel and Distributed Discrete Event Simulation**....96
  T. Gamage, A. Ramadani, D. Hamnes (St. Cloud State University)
- **Securing the Border Gateway Protocol** 109
  M. Nickasch, J. Cavanaugh, M. Kohl, M. Dolfin, S. Rahman (University of Wisconsin-Platteville)

Imaging and Video Processing

- **Content-Aware Image Resizing**....125
  K. Wienkes, K. Hunt (University of Wisconsin – La Crosse)
- **Tracking a Rat in Three Dimensional Space using Stereo Cameras** 135
  M. Meierpolys, M. Krahulec, D. Weibe, O. Hall-Holt, R. Price (St. Olaf College)
- **Scientific Visualization of Magnetic Dipoles in a Lattice**....145
  Z. Oler, T. Urness (Drake University)

Software Engineering

- **Statistical Process Control of Software Processes for Obtaining CMMI Level 5**.....157
  M. Rowe (U. of Wisconsin-Platteville), E. Farver, T. Bragg, M. Kelley, C. Hale (AVISTA Inc.)
- **Introducing a Certificate in Software Testing for Non-Majors**.....172
  J. Drake (University of Northern Iowa)
- **The Characterization and Identification of Object-Oriented Model Defects** 178
  M. Rowe, R. Hasker (University of Wisconsin-Platteville)

Web Technologies

- **Exploring the Web Programming Jungle**.....193
  C. Morrison (University of Wisconsin-Eau Claire)

Application Programming

- **Transversal Homomorphism and Orthogonal within OR/MS/DS Tools into VB.NET 2005**.....208
  E. Tembe (University of Dubuque)
- **PID Control in a Real-Time Embedded Systems Programming Course**.....229
  J. Clifton (University of Wisconsin-Platteville)
- **Simulation and Development of a Range Control Information Display System for UAS Operations in North Dakota** 239
  R. Marsh, S. Buettner, K. Ogaard (U. of N. D.) , J. Nordlie (Regional Weather Information Center)

Algorithms

- **An ANNTI (Artificial Neural Network Text Image) Spam Filter**.....250
  J. Barr, C. Ashbacher (Mount Mercy College)
- **Reflections on a Classic Trio of Graph Problems**.....265
  T. O'Neil (University of North Dakota)
- **Generative Programming Considerations for the Matrix-Chain Problem**.....272
  A. Anda (Saint Cloud State University)

Scientific Computation

- **Simulation of Nitrogen Flow using the St. Olaf Beowulf Cluster**.....280
  A. Waldschmidt, R. Brown, J. Schade (St. Olaf College)
- **The Player is Always Right**.....285
  S. Marquis (Lawrence University)

Artificial Intelligence

- **Chess AI**.....291
  J. Odom (University of Wisconsin-Parkside)
- **Course Scheduling with Genetic Algorithms** 299
  C. Davidson (Simpson College)
- **A Learning Natural Language Parser** 312
  D. McKee (Lawrence University)

Database and Information Retrieval

- **Application of BLAST-based Techniques for Musical Information Retrieval** 322
  F. Korsakov (University of Northern Iowa)
- **Mapping Application Attributes to Object/Relational Mapping Solutions**.....326
  K. Hawkins, E. Towell (Carroll College)

Software Tools

- **Towards Musical Analysis Tools** 343
  C. Hill, S. Hagen (Valley City State University)
- **A Policy-Based Scheduling Tool for Networking Labs** 352
  J. Yu (DePaul University)

Algorithms

- **A Dynamic Algorithm for Computing Periodicities of Misère Impartial Games**.....364
  T. McConville (St. Olaf College)
- **Dispersing Search and Rescue Robots** 373
  Binod K.C., K. Sutherland (Augsburg College)
- **An Exploration of Implementing the A* Algorithm Under Limited Resources in Lego Mindstorms**.....382
  A. Horn (Graceland University)

Classroom Innovation and Management

- **Customizing MediaWiki for Project-based Courses** 395
  O. Hall-Holt (St. Olaf College)
- **Integration of CodeLab into Programming Courses**.....401
  M. Hall (University of Wisconsin-Marathon County)
- **The Capstone Experience: Learning to Manage Uncertainty and Ambiguity in a Project Management Environment**.....413
  S. Lynch (University of Wisconsin-Superior)

Database and Information Retrieval

- **An Algorithm to Restore Data Base Content to Past Dates in Real Time** 424
  C. Brown, D. Guster, B. Jansen (St. Cloud State University)
- **A Methodology for the Design, Development, and Implementation of a Data Warehouse Project**.....436
  C. Azarbod, M. R. Farooq (Minnesota State University at Mankato)

Outreach and Recruitment

- **An Experience in Teaching a Short Summer Robotics Course for High School Students**.....451
  A. Lopez, E. Machkasova (University of Minnesota, Morris)

Software Engineering and Ethics

- **Lightweight Software Cost Estimation Model** 462
  I. Alsmadi (North Dakota State University)

- **ISOMER: Enhancing Test Coverage Using Constrained Random Tests** 468
  D. Kulp, D. Ernst (University of Wisconsin-Eau Claire)
- **Detecting Source Code Plagiarism** 481
  J. Degiovanni, I. Rahal (College of St. Benedict and St. John's University)

Parallel and Distributed Computing

- **Parallelizing the Computation of the SPT Statistic** 494
  T. Fredrick (St. Olaf College)
- **Applications of Beowulf Cluster Computing to Problems in Biology**.....503
  S. Debenport, R. Brown (St. Olaf College)
- **Contemporary Technologies and Platforms for Electronic and Mobile Commerce Systems**.....508
  W. Hu, Y. Zuo (U. of N.D.), L. Chen(Sam Houston State U.), A. Gopalakrishnan (U. of N.D.)

Software Tools

- **A Live View of the World**.....523
  D. Hickok, M. Rowe (University of Wisconsin-Platteville)
- **Computer Supported Collaborative Learning in the Geology Explorer**.....532
  O. Borchert, B. Slator, G. Hokanson, L. Daniels, J. Reber, D. Reetz, B Saini-Eidukat, D. Schwert, J. Terpstra (North Dakota State University)

Pedagogical Issues in Programming

- **The Role of Writing Efficient Programs in a Data Structures Course**.....547
  C. Hu (Carroll College)
- **Effectively Apply Boundary Value Analysis Method in Student's Program Testing**.....557
  S. Rahman (U. of Wisconsin-Platteville)