

24th International Conference on
Computers and Their Applications in
Industry and Engineering
(CAINE-2011)

PROGRAM

November 16-18, 2011

Sheraton Waikiki Hotel
Honolulu, Hawaii USA

Sponsored by



International Society for
Computers and Their Applications

975 Walnut Street, Suite 132
Cary, NC 27511-4216

Phone: (919) 467-5559; Fax: (919) 467-3430; E-mail: isca@ipass.net

24th International Conference on Computers and Their Applications in Industry and Engineering (CAINE-2011)

SPONSOR

International Society for Computers and Their Applications (ISCA)

In cooperation with

Central Michigan University, USA

Taif University, Saudi Arabia

Saudi Internet Scientific Society, Saudi Arabia

Conference Chair

Gongzhu Hu
Central Michigan University

Program Chair

Sultan Aljahdali
Taif University

International Program Committee

Mohamed Aalsalem (Jazan U., Saudi Arabia)
Irfan Ahmed (Beijing U. of Posts and Telecom,
China)

Syed Eqbal Alam (Intl. Inst. of Info. Tech.(IIIT), India)
Ibrahim Albidewi (King Abdul Aziz U., Saudi Arabia)
Abdulaziz S. Almazyad (King Soud U., Saudi Arabia)
Abdullah Al-Mosa (Ministry of Higher Education,
Saudi Arabia)

Chakib Aloui (Taif U., Saudi Arabia)
Sulaiman A.Alyahya (Qassim U., Saudi Arabia)
Cyrus Azarbod (Minnesota State U., USA)
Syed Atif Banawan (Taif U., Saudi Arabia)
AbdelFatah M Bashir (Minnesota State U.
Moorhead, USA)

Kawtar Benghazi (U. of Granada, Spain)
Jim Buchan (Auckland U. of Tech., New Zealand)
Khalid Buragga (King Faisal U., Saudi Arabia)
Fouad B. Chedid (Notre Dame U., Lebanon)
Stuart Cunningham (Glyndwr U., Wales, UK)
Sergiu Dascalu (U. of Nevada, Reno, USA)
Narayan Debnath (Winona State U., USA)
George Dimitoglou (Hood College, USA)
Mohamed Essaaidi (Abdelmalek Essaadi U.,
Morocco)
Said Ghoniemy (Taif U., Saudi Arabia)
Ramzi A. Haraty (Lebanese American U., Lebanon)
George Hamer (South Dakota State U., USA)

Jayantha Herath (St. Cloud State U., USA)
Sami M.Al Homod (King Soud U., Saudi Arabia)
Jing Hu (Franklin & Marshall College, USA)
Donna Hudson (U. of California, San Francisco, USA)
Nisar Hundewale (Taif U., Saudi Arabia)
Norhaslinda Kamaruddin (Nanyang Tech. U.,
Singapore)

Syed Awase Khirni (U. of Zurich, Switzerland)
Angkul Kongmunvattana (Columbus State U., USA)
Stephen Krebsbach (Dakota State U., USA)
Mehedi Masud (Taif U., Saudi Arabia)
Nazar Mohamed (Prince Fahad Bin Sultan U.,
Saudi Arabia)

Rakhi Motwani (U. of Nevada, Reno, USA)
Deok Hee Nam (Wilberforce U., USA)
Ahmad Nasiri (Fahad Bin Sultan U., Saudi Arabia)
Nasser Nassiri (Higher College of Tech.-Dubai, UAB)
Mustafa Nofal (Taif U., Saudi Arabia)
David Pheanis (Arizona St. U.,USA)
Hamed Sallam (Minnesota State U., USA)
Alaa F.Sheta (Electronics Research Institute, Egypt)
Pierre Tiako (Langston U., USA)
Honoriu Valean (Technology U. of Cluj-Napoca,
Romania)

Abdul Wahab (Int. Islamic U., Malaysia)
Beifang Yi (Salem State U., USA)
Youssef Zaz (Agadir U., Morocco)

WEDNESDAY, November 16, 2011

7:30 a.m. – 5:00 p.m. CONFERENCE REGISTRATION – Waianae Room
Coffee/pastries – Waianae Room

8:40 a.m. – 9:00 a.m. WELCOME and Opening Remarks (Kahuku Room)
Gongzhu Hu, CAINE Conference Chair
Sultan Aljahdali, CAINE Program Chair

9:00 – 10:00 a.m. KEYNOTE ADDRESS

PD Habib Zaidi

Geneva University Hospital

“Advances in Multimodality Medical Image Analysis and Processing”

Location: Kahuku Room

10:00 a.m. – 10:20 a.m. Coffee Break

SESSION 1A:

INFORMATICS AND APPLICATIONS

Wednesday, November 16, 10:20 a.m. - 12:00 p.m., Honolulu Room
Session Chair: Dr. Mitch Neilsen, Kansas State University

- 1. A Bayesian Approach to Intelligent Tutoring Systems for Logic Circuit Design Problem Solving**
Hossam Meshref and Sultan Aljahdali (Taif University, Saudi Arabia)
- 2. Distributed Medical Decision Support Systems**
Donna L. Hudson and Maurice E. Cohen (University of California, San Francisco, USA)
- 3. WinDAM: Earthen Embankment Erosion Analysis**
Mitchell L. Neilsen (Kansas State University, USA), Darrel M. Temple and Gregory J. Hanson (USDA Agricultural Research Service, USA)
- 4. Data Preparation for a Digital Humanities Document: Challenges and Observations**
Katia P. Mayfield, Emmanuel Grant, and Crystal Alberts (University of North Dakota, USA)

SESSION 1B:**NETWORKING AND DISTRIBUTED COMPUTING**

Wednesday, November 16, 10:20 a.m. - 12:00 p.m., Kahuku Room
Session Chair: Dr. Bidyut Gupta, Southern Illinois University

- 1. An Efficient Recovery Scheme for Cluster Federations**
Bidyut Gupta (Southern Illinois University, USA), Ziping Liu (Southeast Missouri State University, USA), and Sindooru Koneru (Southern Illinois University, USA)
- 2. Secure Multicasting for Wide Area Networks**
Sindooru Koneru, Arun Nagarajan, Bidyut Gupta (Southern Illinois University, USA) and Ziping Liu (Southeast Missouri State University, USA)
- 3. A Comprehensive Study of Node Replication Attack in Wireless Sensor Networks**
Wazir Zada Khan (Jazan University, Saudi Arabia), Yang Xiang (Deakin University, Australia), Mohammed Y. Aalsalem and Quratulain Arshad (Jazan University, Saudi Arabia)
- 4. Two Automated Techniques for Analyzing and Debugging MPI-Based Programs**
Sultan Aljahdali (Taif University, Saudi Arabia), Mosaid Al Sadhan (King Saud University, Saudi Arabia), and Alaa Ismail Elnashar (Taif University, Saudi Arabia)

12:00 p.m. – 1:30 p.m LUNCH BREAK ON OWN

SESSION 2A:**NEURAL NETWORKS**

Wednesday, November 16, 1:30 p.m. - 3:10 p.m., Honolulu Room
Session Chair: Dr.

- 1. Gas/Oil Separator Optimization**
Moustafa Elshafei and Mahmoud A. Doklah (King Fahd University of Petroleum and Minerals, Saudi Arabia)
- 2. A Neural Network Model for Magnetic Declination**
Muhammad Sabih, Moustafa Elshafei, and Anwar Sheikh (King Faud University of Petroleum and Minerals, Saudi Arabia)
- 3. Autonomous Mobile Robot Localization Based on RSSI Measurements Using an RFID Sensor and Neural Network BPANN**
Khalid Al-Mutib and Nossabia Sabtio (King Saud University, Saudi Arabia)
- 4. On-Line Individual Verification using Typing Velocity**
Abdullah I. Al-Shoshan (Qassim University, Saudi Arabia)

SESSION 2B:**DATA MINING AND MACHINE LEARNING**

Wednesday, November 16, 1:30 p.m. - 3:10 p.m., Kahuku Room
Session Chair: Dr. Myungsook Klassen, California Lutheran University

- 1. Supervised Learning Algorithms to Enhance DDoS Prediction in Network Forensics**
Carol M. Jim (George Washington University, USA), Ahmed Salem, Aijuan Dong, and James Devilbiss (Hood College, USA)
- 2. Search Web Page Classification Using Form Structural Characteristics**
Myungsook Klassen and Chenxiao Wang (California Lutheran University, USA)
- 3. Randomization, Transformation, and Virtual Knowledge Bases**
Stuart Rubin (Space and Naval Warfare Systems Center, USA) and Gongzhu Hu (Central Michigan University, USA)
- 4. A Density-Based Approach with VSM and Weighted N-Grams for Detecting Web Document Outliers**
Ayman H. Tanira (Palestine Technical College, Palestine), Ahmed A. Rafea (American University, Egypt), and Hesham A. Hassan (Cairo University, Egypt)

3:10 p.m. – 3:30 p.m. Coffee Break

SESSION 3A:

ALGORITHM, SYSTEM AND PERFORMANCE ANALYSIS

Wednesday, November 16, 3:30 p.m. - 5:10 p.m., Honolulu Room
Session Chair: Dr. Chaman L. Sabharwal, Missouri University of S&T

- 1. Performance Analysis for Truncated ARQ based DSFBC-CO-OFDM Communication Scheme**
Irfan Ahmed, Sultan Aljahdali, Nisar Hundewale (Taif University, Saudi Arabia), Amr Mohamed (Qatar University, Qatar), and Syed Ismail Shah (Iqra University, Pakistan)
- 2. An Automated Theorem Prover Using Term-Functor Logic**
Jon Greenlee and James Hearne (Western Washington University, USA)
- 3. Reducing 9-Intersection to 4-Intersection for Identifying Relations in Region Connection Calculus**
Chaman L. Sabharwal and Jennifer L. Leopold (Missouri University of S&T, USA)
- 4. D* Lite based Real-Time Multi-Agent Path Planning in Dynamic Environments**
Khalid Al-Mutib, Mansour AISulaiman, Muhammad Emaduddin, and Hedjar Ramdane (King Saud University, Saudi Arabia)

SESSION 3B:

TUTORIAL #1:

ENHANCING USER EXPERIENCE OF MOBILE DEVICE USERS

Wednesday, November 16, 3:30 p.m. - 5:10 p.m., Kahuku Room
Tutorial Chair: Dr. S.R. Subramanya

Abstract

Mobile phones have become ubiquitous in a very short span of time and their impacts on various aspects of our lives have been significant and are expected to grow more in the future. There are several characteristics of a typical mobile user such as changing contexts, limited attention spans, etc. In addition the mobile devices also have constraints such as limited sizes of screens for viewing and interacting, limited memory, limited processor power, etc. For the effective use of mobile phones, the “user experience” is a very critical factor from a user point of view, which should provide a natural and intuitive abstraction, hiding the complexities of the various technologies from the user. This tutorial presents the various dimensions and parameters of user experience and schemes for enhancing the user experience.

THURSDAY, NOVEMBER 17, 2011

8:00 a.m. – 12:00 p.m. - CONFERENCE REGISTRATION – Waianae Room

Coffee/pastries - Waianae Room

Thursday, November 17, 8:30 a.m. - 9:30 a.m., Honolulu Room

SNA PANEL DISCUSSION

“The Impact of Sensor Networks on the Technology Market”

Panelists: Gordon Lee (Chair), Stuart Rubin, Habib Zaidi*, Gongzhu Hu, Michael McMahon, and Qi Cheng

* to be confirmed

9:30 a.m. – 10:00 a.m. COFFEE BREAK

SESSION 4A:

SENSOR NETWORKS AND APPLICATIONS I

Thursday, November 17, 10:00 a.m. – 11:40 a.m., Honolulu Room
Session Chair: Dr. Gordon Lee, San Diego State University

- 1. A Web-Based Mobile Robotic System for Control and Sensor Fusion Studies**
Christopher Paoloini (San Diego State University, USA) Gerold Huber (University of Applied Sciences, Austria), Quentin Collier (IUT de Bethune, France), and Gordon K. Lee (San Diego State University, USA)
- 2. Unconstrained Bed Monitoring System for Scratching Motion**
Toshihiro Shino (Hosei University, Japan), Yosuke Kurihara (Seikei University, Japan), Shoko Nukaya (Tokyo Medical and Dental University, Japan), Kajiro Watanabe (Hosei University, Japan), and Hiroshi Tanaka (Tokyo Medical and Dental University, Japan)
- 3. Sequential Hybrid Map Learning through Human-Robot Interaction**
Gang Li, Qi Cheng and Weihua Sheng (Oklahoma State University, USA)
- 4. S.E.N.S.O.R. – Applying Modern Software and Data Management Practices to Climate Research**
Michael McMahon Jr., Sergiu M. Dascalu, Frederick C. Harris, Jr., and Scotty Strachan (University of Nevada, Reno, USA)

SESSION 4B:**SPECIAL SESSION on SOFTWARE AND APPLICATIONS**

Thursday, November 17, 10:00 a.m. – 11:40 a.m., Kahuku Room
Session Chair: Dr. Narayan C. Debnath, Winona State University

- 1. User-friendly Model Checking Integration in Model-based Development**
Alarico Campetelli, Florian Hölzl, and Philipp Neubeck (Technische Universität München, Germany)
- 2. Analysis of Some of the Root Causes of Bugs in a Mobile Phone Software Development Environment**
S. R. Subramanya (National University, USA)
- 3. Software Metrics Validation: A Preliminary Approach**
Narayan C. Debnath and Shaker Elsabbagh (Winona State University, USA),
Haesun K. Lee and Ilhun Lee (University of Texas of the Permian Basin, USA)
- 4. Optimization in DP Detection Using ARG**
Chunky Gupta, Mohita Menon (CSED MNNIT, India) and Narayan C. Debnath (Winona State University, USA)

11:40 p.m. – 1:30 p.m.

**CONFERENCE LUNCHEON
(Ni'lhau Room)**

CONFERENCE AWARDS**SESSION 5A:****SENSOR NETWORKS AND APPLICATIONS II**

Wednesday, November 16, 1:30 p.m. - 3:10 p.m., Honolulu Room
Session Chair: Dr. Gordon Lee, San Diego State University

- 1. Secure Communications for Event-Driven Wireless Sensor Networks**
Norman Dziengel, Nicolai Schmittberger, Jochen Schiller, and Mesut Günes (Freie Universität Berlin, Germany)
- 2. Transformative Reasoning about Sensor Information using Heuristic Calculus**
Stuart Rubin (SSC PAC, USA) and Gordon K. Lee (San Diego State University, USA)
- 3. Sink Driven Axes based Data Aggregation in Wireless Sensor Network**
Ashok V. Sutagundar (Basaveshwar Engineering College, India), Sunilkumar S. Manvi (REVA Institute of Technology and Management, India), and Narayan C. Debnath (Winona State University, USA)
- 4. Modeling Unreliable Data and Sensors: Analyzing False Alarm Rates using Training Weighted Ranking**
Vasanth Iyer (International Institute of Information Technology, India), S. Sitharama Iyengar (Florida International University, USA), Garmiela Rama Murthy (International Institute of Information Technology, India), and Mandalika B. Srinivas (Brila Institute of Technology and Science, India)

SESSION 5B:**Information Systems and Applications**

Thursday, November 17, 1:30 p.m. - 3:10 p.m., Kahuku Room
Session Chair: Dr. Peter Kokol, University of Maribor

1. **An Empirical Approach for Annotating Web Services**
Djelloul Bouchiha, Mimoun Malki (Djillali Liabes University of Sidi, Algeria),
Abdullah Alghamdi, Khalid Alnafjan (King Saud University, Saudi Arabia)
2. **Variant Logic Automatic Update for MDA Based Enterprise Information Systems**
Jon Davis and Elizabeth Chang (Curtin University, Australia)
3. **Reassuring Tourism Information Systems**
Tokuro Matsuo and Koki Murakata (Yamagata University, Japan)
4. **Intelligent System Supported Evidence Based Management**
Peter Kokol and Gregor Stiglic (University of Maribor, Slovenia)

3:10 p.m. – 3:30 p.m. COFFEE BREAK

SESSION 6A:**SPEECH AND AUDIO RECOGNITION, VISUALIZATION**

Thursday, November 17, 3:30 p.m. – 5:10 p.m., Honolulu Room
Session Chair: Dr. Abdulaziz S. Almazayad, King Saud University

1. **Automatic Segmentation Algorithm of Vowels in Arabic CVC Words**
Yousef A. Alotaibi and Ali H. Meftah (King Saud University, Saudi Arabia)
2. **Virtual Reality Based Visualization Environment for Structural Health Monitoring Analysis**
Asmah Muallem, Sachin Shetty, and S. Keith Hargrove (Tennessee State University, USA)
3. **Speech Recognition for Medically Disordered Voice**
Mansour Alsulaiman (King Saud University, Saudi Arabia)
4. **Environment Sound Recognition for Digital Audio Forensics using ZC, MFCC, MPEG-7 and LPC Features**
Mubarak Obaid AlQahtani and Abdulaziz S. Almazayad (King Saud University, Saudi Arabia)

SESSION 6B:**TUTORIAL #2:****New Generation Green Computing: Towards Safe City Planning and Sustainability**

Wednesday, November 16, 3:30 p.m. – 5:10 p.m., Kahuku Room
Session Chair: Dr. Tokuro Matsuo

Abstract

East Japan damaged from Heavy Earthquakes and Tsunami on March 11, 2011. Tsunami made everything flow out from peaceful city. A lot of people still love their place, and they want to recover and re-establish better city against disasters and CO₂. It is not easy to do it because people have multiple thinking and government has some intentions about new city planning. In this tutorial, we explain our big project on heavily-subsidized grant including; design to make new city; evaluation of environmental load; evaluation of environmental amenity to live; massive simulation; and group decision support system to make a consensus between multiple players.

**8:00 a.m. – 12:00 p.m. - CONFERENCE REGISTRATION - Coffee/pastries
(Waianae Room)**

SESSION 7A:

IMAGE PROCESSING, VISION

Friday, November 18, 8:20 a.m. - 10:00 a.m., Honolulu Room
Session Chair: Dr.

- 1. Interactive Smart TV Control System using Hand Gesture Recognition**
Myoung-Kyu Sohn, Sang-Heon Lee, Byungmin Kim, and Jangwoo Lee (Daegu Gyeongbuk Institute of Science and Technology, Korea)
- 2. Improved Face Detection Method Using Edge Histogram Feature in the Infrared Images**
Sang-Heon Lee, Myoung-Kyu Sohn, Byungmin Kim, Jangwoo Lee, Chiho Park (Daegu Gyeongbuk Institute of Science and Technology, Korea) and Chul-Ho Won (Kyung-il University, Korea)
- 3. (KSU-IMR) An Intelligent Mobile Robotics System: Active Stereo Vision Path Planning Navigation For Unstructured Environments**
Khalid Al Mutib, Mansour Al Sulaiman, Hassan Mathkour (King Saud University, Saudi Arabia), Ebrahim A. Mattar (University of Bahrain, Bahrain), and Hedjar Ramdane (King Saud University, Saudi Arabia)
- 4. High Availability Using Virtualization**
Amartya Dasgupta (IIIT-Bangalore, India), Syed Eqbal Alam (Taif University, Saudi Arabia), Arijit Mitra, Salone Gupta, Sneha Joseph, and Shrisha Rao (IIIT-Bangalore, India)

SESSION 7B:

SYSTEMS DESIGN, ANALYSIS, AND TOOLS

Friday, November 18, 8:20 a.m. - 10:00 a.m., Kahuku Room
Session Chair: Dr.

- 1. On Distribution of the Error and Non-Error Changes in the Eclipse Project**
Pitamber Tiwari, Wei Li, and M. Neale Currie (University of Alabama in Huntsville, USA)
- 2. Application Development for Improving Requirements Specification Writing**
Yun-Sung Kang, Ju-Ik Kim (Samsung Advanced Institute of Technology, South Korea) and San-Yoon Min (Korea Advanced Institute of Science and Technology, South Korea)
- 3. Modeling of a Non-Stationary Process Corrupted by a Symmetrically Distributed Noise using the Evolutionary Bispectrum**
Abdullah I. Al-Shoshan (Qassim University, Saudi Arabia)
- 4. A Visual Modeling Tool for SystemC Functional MPSoC Design**
Nabil Berrehouma (Université 08 Mai, Algeria), El-bay Bourennane (University of Bourgogne, France), Allaoua Chaoui (Université Mentouri, Algeria), and Ouassila Labbani (University of Bourgogne, France)

10:00 a.m. – 10:20 a.m. COFFEE BREAK

SESSION 8A:**SECURITY AND HIGH PERFORMANCE COMPUTING**

Friday, November 18, 10:20 a.m. - 12:00 p.m., Honolulu Room

Session Chair: Dr.

1. **Optimized I/O Operations for Checkpoint Creation in BLCR**
Jason Cornwell and Angkul Kongmunvattana (Columbus State University, USA)
2. **Increasing the Reliability of the Collected Data in Wireless Sensor Networks**
Yaqoob J.Y. Al-Raisi (Sultan Qaboos University, Oman), Nazar Alfadil (Fahad Bin Sultan University, Saudi Arabia), Sultan Aljahdali (Taif University, Saudi Arabia)
3. **Mapping Water Sector Cyber-Security Vulnerabilities**
James H. Graham, Jeffrey L. Hieb and J. Chris Foreman (University of Louisville, USA)
4. **A Water System Simulation for Testing Security Enhancements to SCADA Field Devices**
Justin R. Adams, Jeffrey L. Hieb, James H. Graham, and Rammohan K. Ragade (University of Louisville, USA)

SESSION 8B:**SOFTWARE ENGINEERING**

Friday, November 18, 10:20 a.m. - 12:00 p.m., Kahuku Room

Session Chair: Dr.

1. **Evaluation of Automated Static Analysis Tools**
Chang-Shyh Peng (California Lutheran University, USA), Cathleen L. Blackmon and Daisy F. Sang (Cal Poly Ponomo, USA)
2. **TrueRefactor: An Automated Refactoring Tool to Improve Legacy System and Application Comprehensibility**
Isaac Griffith, Scott Wahl, and Clemente Izurieta (Montana State University, USA)
3. **An Automated Software Tool for Validating Design Patterns**
Shane Strasser, Colt Frederickson, Kevin Fenger, and Clemente Izurieta (Montana State University, USA)
4. **Goal Oriented Requirements Engineering - A Review**
Sultan Aljahdali, Jameela Bano, and Nisar Hundewale (Taif University, Saudi Arabia)
5. **DSS: A Software Tool to Extract Object-Oriented Design State Space**
Raouf Alomainy, Wei Li, and M. Neale Currie (University of AL In Huntsville, USA)