

19<sup>th</sup> International Conference on  
Computers and Their Applications  
(CATA-2004)

# PROGRAM

March 18-20, 2004

Red Lion Hotel on Fifth Avenue  
Seattle, Washington USA

Sponsored by



International Society for  
Computers and Their Applications

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# 19<sup>th</sup> International Conference on Computers and Their Applications (CATA-2004)

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Winona State University

### **Program Chair**

Bidyut Gupta  
Southern Illinois University

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Shin-Jer Yang (Soochow Univ., Taiwan)  
Min-You Wu (Univ. of New Mexico, USA)

**THURSDAY, MARCH 18, 2004**

**7:30 a.m. – 4:00 p.m. CONFERENCE REGISTRATION - Emerald Foyer, 3<sup>rd</sup> Floor**

**9:00 a.m. WELCOME and Opening Remarks  
(Bainbridge Room)**

**Bidyut Gupta, CATA-2004 Program Chair  
Southern Illinois University**

**SESSION 1A:**

**IMAGE PROCESSING I**

Thursday, March 18, 9:20 a.m. - 11:00 a.m., Bainbridge Room  
Session Chair: Dr. Waleed W. Smari, University of Dayton

- 1. A Real-time Quadtree Searchless Fractal Image Compression Device**  
Songpol Ongwattanakul, Xianwei Wu, David Jeff Jackson (The University of Alabama, USA)
- 2. A New Searchless Two-Level IFS Fractal Image Encoding Method**  
Xianwei Wu, David Jeff Jackson, Hui-Chuan Chen (The University of Alabama, USA)
- 3. Video Mosaics Based on Steepest Descent Algorithm**  
Ching-Tang Hsieh, Eugene Lai, Sung-Yi Chen (Tamkang University, Taiwan)
- 4. Image Coding Based on One-step Wavelet Transform**  
Qiang Bo, Jeff A. Shafer, Waleed W. Smari, John G. Weber and Frank Scarpino (University of Dayton, USA)

**SESSION 1B:**

**MODELING & SIMULATION I**

Thursday, March 18, 9:20 a.m. – 11:00 a.m., San Juan Room  
Session Chair: Dr. Parimal Patel, The University of Texas at San Antonio

- 1. A Study of a Generalization of a Card Problem**  
Zhizhang Shen (Plymouth State University, USA) and Timothy Healy (Emporia State University, USA)
- 2. Modeling Methods for Coastal Environmental Studies**  
Carl Steidley, Alexey Sadovski, Rafik Bachnak, Kelly Torres (Texas A&M University, USA)
- 3. Scalability of Agent-Based Onion Routing Network**  
Ronggong Song and Larry Korba (National Research Council of Canada, Canada)

**SESSION 1C:**

**COMPUTING PRACTICE & APPLICATION I**

Thursday, March 18, 9:20 a.m. – 11:00 a.m., Whidbey Room  
Session Chair: Dr. Bidyut Gupta, Southern Illinois University

- 1. An Application of Knowledge Discovery Techniques on Stock Market**  
Yihua Philip Sheng, Wen-Chi Hou (Southern Illinois University, USA) , Zhong Chen (Shanghai Jiao Tong University, China)
- 2. A Flexible Integration Model for Web-based E-Commerce Transactions**  
Chima Adiele and Sylvanus A. Ehikioya (University of Manitoba, Canada)
- 3. RPM: A Remote PC Power Management Tool**  
Thao Phuong Nguyen and Du Zhang (California State University, USA)

11:00 a.m. – 11:15 a.m.

COFFEE BREAK

**SESSION 2A:**

**IMAGE PROCESSING II**

Thursday, March 18, 11:15 a.m. - 12:30 p.m., Bainbridge Room  
Session Chair: Dr. David J. Jackson, The University of Alabama

1. **Adaptive Image Compression with Neural-Net Predictor Optimized by Quasi-Simulated Annealing**  
Satoshi Mizuta (Hiroasaki University, Japan)
2. **Morphological Image Processing Using Custom Instructions on Distributed Nios Processors**  
Haichen Ren and David J. Jackson (The University of Alabama, USA)
3. **Angular Histograms for Shape Retrieval**  
Atul Sajjanhar (Deakin University, Australia), Guojun Lu, Dengsheng Zhang (Monash University, Australia)

**SESSION 2B:**

**MODELING & SIMULATION II**

Thursday, March 18, 11:15 a.m. - 12:30 p.m., San Juan Room  
Session Chair: Dr. Waleed W. Smari, University of Dayton

1. **Fire Emergency Building Evacuation: A Computer Simulation Model**  
Mohammed E. Haque and Shashikala Balasubramanian (Texas A&M University, USA)
2. **Efficient Parallel Simulation of Direct Methanol Fuel Cell Models**  
S. Rajasekaran, R. Ammar, K. Reifsnider, L. Achenie, A. Mohamed, G. Zhang, and M. Ahmed (University of Connecticut, USA)
3. **Virtual Ethnography: a Computer-Based Approach**  
Natalie Ardet (Freie Universität Berlin, Germany), Matthias Thome (Universität des Saarlandes, Germany)

**SESSION 2C:**

**SOFTWARE ENGINEERING & CASE I**

Thursday, March 18, 11:15 a.m. - 12:30 p.m., Whidbey Room  
Session Chair: Dr. Mark Burgin, University of California

1. **Metamodel Code Generation for a Model Driven Architecture**  
Stefan Mitterdorfer, Egon Teiniker, Christian Kreiner (Graz University of Technology, and Salomon Automation GmbH, Austria), Zsolt Kovács (Salomon Automation GmbH, Austria), and Reinhold Weiss (Graz University of Technology, Austria)
2. **A Test Case Generator for Three-variable Functions: Object-Oriented Design and Implementation**  
Narayan Debnath, Joshua Wilson and Joseph Cropper (Winona State University, USA), Mark Burgin (University of California, USA), Hamid Abachi (Monash University, Australia)
3. **Measuring Software Maintenance**  
M. Burgin (University of California, Los Angeles, USA) and N. Debnath (Winona State University, USA)

12:30 p.m. – 2:00 p.m.

LUNCH BREAK ON OWN

**SESSION 3A:****ARTIFICIAL INTELLIGENCE**

Thursday, March 18, 2:00 p.m. - 3:15 p.m., Bainbridge Room  
Session Chair: Dr. Donna L. Hudson, University of California, San Francisco

1. **Reasoning with Negation and Sets**  
James D. Jones (University of Arkansas at Little Rock, USA)
2. **A Theory of Probabilistic Decision Making for Intelligent Systems**  
Kazunori Matsumoto and Kenichi Torii (Kanagawa Institute of Technology, Japan)
3. **Consequential Intelligent Agent Systems**  
D. L. Hudson (University of California, San Francisco, USA), M. E. Cohen (University of California, San Francisco, USA and California State University, Fresno, USA)

**SESSION 3B:****COMPUTING PRACTICE & APPLICATION II**

Thursday, March 18, 2:00 p.m. - 3:15 p.m., San Juan Room  
Session Chair: Dr. Ilhyun Lee, University of Texas of the Permian Basin

1. **A Tool for Text Summarization**  
Ateendra Sudarshak Balasingham and Du Zhang (California State University, USA)
2. **A Platform for Studying and Facilitating Two-Handed Interaction**  
Tong Du (VirtualScopics, LLC, USA) and Michael Wainer (Southern Illinois University, USA)
3. **Real Time Fabric Fault Detection**  
A. Abdel-raouf, R. Ammar, H. Sholl (University of Connecticut, USA), S. Nassar (Electronic Research Institute, Egypt)

**3:15 p.m. – 3:30 p.m.**

**COFFEE BREAK**

**SESSION 4A:****ALGORITHM I**

Thursday, March 18, 3:30 p.m. – 5:10 p.m. , Bainbridge Room  
Session Chair: Dr. Sin Ming Loo, Boise State University

1. **Updating Z Ordered Representations of Data Sets**  
Kirk Scott (University of Alaska Anchorage, USA)
2. **A Task Graph Set for Evaluation of Reconfigurable Hardware Scheduling Algorithms**  
Sin Ming Loo (Boise State University, USA) and J. D. Winningham (University of Alabama in Huntsville, USA)
3. **Parallel Thinning on Rmesh**  
John Jenq (Montclair State University, USA), Wingning Li (University of Arkansas, USA)

**SESSION 4B:**

**INFORMATION SYSTEMS**

Thursday, March 18, 3:30 p.m. – 5:10 p.m., San Juan Room  
Session Chair: Dr. Ilhyun Lee, University of Texas of the Permian Basin

1. **Decision Tree Induction for Dynamic, High-Dimensional Data Using P-Trees**  
Anne Denton and William Perrizo (North Dakota State University, USA)
2. **Building Agent Community for Web Service Integration**  
Cheng-Hsiung Hung and Jason Jen-Yen Chen (National Central University, Taiwan)
3. **Annotating Linguistic Data with ImageSpace for the Preservation of Endangered Languages**  
Shiyong Lu, Rong Huang, and Farshad Fotouhi (Wayne State University, USA)
4. **A Light-weight Distributed Web Search Engine: Distributed Web Crawling Part**  
Yihua Philip Sheng (Southern Illinois University, USA), Zhong Chen (Shanghai Jiao Tong University, China), Shahram Rahimi, Srinivas Mandalapu (Southern Illinois University, USA)

**SESSION 4C:**

**SOFTWARE ENGINEERING & CASE II**

Thursday, March 18, 3:30 p.m. – 5:10 p.m., Whidbey Room  
Session Chair: Dr. Walter Dosch, University of Lübeck

1. **Qualitative Evaluation of Information Systems Using Kiviat Graphs**  
Cyril S. Ku (William Paterson University, USA)
2. **Reasoning in Collaboration Diagrams by Description Logics**  
Hiroyuki Nakanishi, Takao Miura (Hosei University, Japan), Isamu Shioya (Sanno University, Japan)
3. **A Deterministic-Heuristic Load Balancing Methodology for MPIAB**  
Meha Sabharwal, Shahram Rahimi, Raheel Ahmad, Ajay Narayanan (Southern Illinois University, USA)
4. **Software Design Method for Agent Systems from Scenarios**  
Kazunori Matsumoto (National Institute of Technology, Japan) and Shinichi Honiden (National Institute of Informatics, Japan)

**8:00 a.m. – 4:00 p.m. - CONFERENCE REGISTRATION (Emerald Foyer, 3<sup>rd</sup> Floor)**

**SESSION 5A:**

**SPECIAL SESSION: SOFTWARE RELIABILITY I**

Friday, March 19, 8:30 a.m. - 10:10 a.m., Bainbridge Room

Session Chair: Dr. Sung Shin, South Dakota State University

- 1. Fault-Tolerance Implementation on P2P Data Mining**  
Rex E. Gantenbein, Jung Yeop Kim (University of Wyoming, USA), Chang Oan Sung (Indiana University Southeast, USA), Charlie Y. Shim (South Dakota State Univ., USA)
- 2. Reliable High-Speed Communication Module for Linux Cluster File System Using M-VIA**  
Sung Shin and ChanGon Yoo (South Dakota State University, USA) and Chih-Cheng Hung (Southern Polytechnic State University, USA)
- 3. Ickpt: An Efficient Incremental Checkpointing Using Page Writing Fault - Focusing on the Implementation in Linux Kernel**  
Sangjo Yi, Junyoung Heo, Yookun Cho (Seoul National University, Korea), Jiman Hong (Kwangwoon University, Korea), Jongmoo Choi (Dankook University, Korea) and Gangil Jeon (Korea Polytechnic University, Korea)
- 4. A Methodology for Developing an Adjustable Security Design Metric by Mapping Software Testing into Security Testing**  
Charlie Y. Shim (South Dakota State University, USA), Chang Oan Sung (Indiana University Southeast, USA), Jung Y. Kim (University of Wyoming, USA) and Jinoo Park (SemoLogic, Inc., USA)

**SESSION 5B:**

**ALGORITHM II**

Friday, March 19, 8:30 a.m. - 10:10 a.m., San Juan Room

Session Chair: Dr. Gordon Lee, San Diego State University

- 1. Alleviation of the Impact of the Apex Nodes on Routing in the Pyramid Structures**  
Zhizhang Shen (Plymouth State University, USA)
- 2. Convergence Properties of Genetic Algorithms**  
Hong Kyu Lee (Korea University of Technology, Korea) and Gordon K. Lee (San Diego State University, USA)
- 3. Learning Object Oriented Programming by Creating Visualizations**  
Paul Juell (North Dakota State University, USA), Vijayakumar Shanmugasundaram (Concordia College, USA)

**SESSION 5C:****COMPUTER ARCHITECTURE & VLSI I**

Friday, March 19, 8:30 a.m. - 10:10 a.m., Whidbey Room  
Session Chair: Dr. Walter Dosch, University of Lübeck

1. **Artificial Neural Network-Based Human Target Detection Using Noninvasive Penetrating Radar Data**  
John M. Weiss, Chad Hartsel (South Dakota School of Mines and Technology, USA),  
Bernt Askildsen, Scott Thompson (RealTronics Corporation of the Black Hills, USA)
2. **Application of Process Control for Improving Performance of FMS Systems Using X-Tree Multibus Advanced Parallel Computer Systems**  
Hamid R. Abachi (Monash University, Australia), M. A. Abdollahian (Monash University  
and RMIT University, Australia), Narayan C. Debnath (Winona State University, USA)
3. **History Abstractions of a Sequential Memory Component**  
Walter Dosch and Annette Stümpel (University of Lübeck, Germany)

**10:10 a.m. – 10:30 a.m. COFFEE BREAK**

**SESSION 6A:****SPECIAL SESSION: SOFTWARE RELIABILITY II**

Friday, March 19, 10:30 a.m. - 12:10 p.m., Bainbridge Room  
Session Chair: Dr. Sung Shin, South Dakota State University

1. **Reliable Transformation between Java RMI and CORBA Programs**  
Haklin Kimm (East Stroudsburg University of Pennsylvania, USA)
2. **Pre-fetching and Pre-releasing Based LRU for Efficient/Reliable Cache Management**  
Younghun Ko, Hyunseung Choo, and Jaehyoum Kim (Sungkyunkwan University, Korea)
3. **Dynamic Cache Partition Strategy for Reliable Buffer Cache Management**  
Jaesun Jin, Hyunseung Choo, and Jaehyoum Kim (Sungkyunkwan University, Korea)
4. **Reliable Ontology Enhanced Medical Information Retrieval**  
Injoo Jeong, Louis Green (East-West University, USA), Yeongkwun Kim (Western Illinois  
University, USA), and Martha W. Evens (Illinois Institute of Technology, USA)

**SESSION 6B:****COMPUTER VISION, ROBOTICS, & MULTIMEDIA**

Friday, March 19, 10:30 a.m. - 12:10 p.m., San Juan Room  
Session Chair: Dr. Min-You Wu, The University of New Mexico

1. **An Intelligent Automated Surveillance System for Parked Vehicles**  
Josh Hight and Chenyi Hu (University of Central Arkansas, USA)
2. **Functionally Distributed Control Architecture for Robot Systems**  
Tetsuya Taira, Nobuyuki Yamasaki (Keio University, Japan)
3. **Capacity Analysis of Scheduled Video Delivery Service**  
Wei Shu and Min-You Wu (The University of New Mexico, USA)

**SESSION 6C:****COMPUTER ARCHITECTURE & VLSI - II**

Friday, March 19, 10:30 a.m. - 12:10 p.m., Whidbey Room  
Session Chair: Dr. Gongzhu Hu, Central Michigan University

1. **An FPGA-Based Area Efficient Tri-port Registerfile Design for RISC-Style Processor Implementations**  
David Jeff Jackson, William A. Stapleton, Kenneth G. Ricks, David Minor (The University of Alabama, USA)
2. **The Instruction Execution Mechanism for Responsive Multithreaded Processor**  
Tstomu Itou, Nobuyuki Yamasaki (Keio University, Japan)
3. **Optically Interconnected Intelligent RAM Multiprocessor: Gigascale Opto-IRAM**  
Chung-Seok (Andy) Seo, Abhijit Chatterjee and Timothy J. Drabik (Georgia Institute of Technology, USA)
4. **SPA: A Scalable Per-Address Branch Predictor**  
Angkul Kongmunvattana and Ekkasit Tiamkaew (University of Nevada Reno, USA)

**12:15 p.m. – 2:00 p.m. CONFERENCE LUNCHEON - EMERALD III Room**

**KEYNOTE SPEAKER: Professor Steven L. Tanimoto**  
Department of Computer Science and Engineering  
University of Washington, Seattle

**" Transparent Interfaces: Letting the User in on the Secret "**

**2:00 – 2:30 p.m. - ISCA ANNUAL GENERAL ASSEMBLY MEETING**

**ISCA Members, Guests, and all conference participants are Welcome!**

**SESSION 7A:****DATABASE I**

Friday, March 19, 2:45 p.m. - 4:00 p.m., Bainbridge Room  
Session Chair: Dr. Gongzhu Hu, Central Michigan University

1. **Efficient Ranking of Keyword Queries Using P-trees**  
Fei Pan, Imad Rahal, Yue Cui, William Perrizo (North Dakota State University, USA)
2. **Component Specification to test Component-based Software**  
Supaporn Kansomkeat, Wanchai Rivepiboon (Chulalongkorn University, Thailand)
3. **Data Sharing over the Internet and Web under ADO.NET**  
David Zhang and Gongzhu Hu (Central Michigan University, USA)

**SESSION 7B:****OPERATING & DISTRIUTED SYSTEMS I**

Friday, March 19, 2:45 p.m. - 4:00 p.m., San Juan Room  
Session Chair: Dr. Sin Ming Loo, Boise State University

1. **Garbage Collection Schemes for Shared Memory Multiprocessors**  
Khayri A. Ali (Oct. University for Midern Science and Arts, Egypt), Fatma A. Omara (Cairo University, Egypt), and Osama A. Elshakankiry (Minufiya University, Egypt)
2. **Locating Services for Intelligent Mobile Agents**  
Lei Song and Xining Li (University of Guelph, Canada)
3. **Nearly Dynamic Task Model Scheduling with Aperiodic Tasks**  
Haesun K. Lee, Ilhyun Lee (University of Texas of the Permian Basin, USA)

**SATURDAY, MARCH 20, 2004**

**8:00 a.m. – 10:00 a.m. - CONFERENCE REGISTRATION (Emerald Foyer – Third Floor)**

**SESSION 8A:**

**DATABASE II**

Saturday, March 20, 8:30 a.m. - 9:45 a.m., Bainbridge Room  
Session Chair: Dr. Bidyut Gupta, Southern Illinois University

1. **Multi-dimensional Nearest Neighbor Search with Non-Uniform Data Sets**  
Yongsong Shi, Wen-Chi Hou, and Chih-Fang Wang (Southern Illinois University, USA)
2. **Object-Oriented Implementation of a Rule-Based XML Query Optimizer**  
Dunren Che (Southern Illinois University, USA)
3. **Performance Analysis of Two-Phase Locking: Data Contention vs. Resource Contention**  
Yu Wang, Wen-Chi Hou, Chih-Fang Wang, Dunren Che (Southern Illinois University, USA)

**SESSION 8B:**

**OPERATING & DISTRIBUTED SYSTEMS II**

Saturday, March 20, 8:30 a.m. - 9:45 a.m., San Juan Room  
Session Chair: Dr. William Perrizo, North Dakota State University

1. **Design Automation Method for Software Development in Complex Embedded Systems**  
Ying Qiao, Luqi, Lynn Zhang (Naval Postgraduate School, USA)
2. **A Distributed Multiagent Architecture Representing a Virtual Marketplace**  
Sherif Elfayoumy, Stanley Jefson, and Sanjay Ahuja (University of North Florida, USA)
3. **Comparative Evaluation of Fair-Share CPU Scheduling Algorithms Under Multiprogrammed Workloads**  
Angkul Kongmunvattana and Clifton A. Frazier (University of Nevada Reno, USA)

**SESSION 8C:**

**COMPUTER NETWORKS I**

Saturday, March 20, 8:30 a.m. - 9:45 a.m., Whidbey Room  
Session Chair: Dr. Sergiu Dascalu, University of Nevada, Reno

1. **Mechanism Design for Proxy Placement on Overlay Networks**  
Min-You Wu and Wei Shu (The University of New Mexico, USA)
2. **A UML-Based Approach for Testing Web Applications**  
Manish Nilawar, Sergiu Dascalu (University of Nevada, Reno, USA)

**9:45 a.m. – 10:00 a.m. COFFEE BREAK**

**SESSION 9A:****IMAGE PROCESSING III**

Saturday, March 20, 10:00 a.m. - 11:40 a.m., Bainbridge Room  
Session Chair: Dr. Carl G. Looney, University of Nevada, Reno

1. **Image Retrieval Using Modified Generic Fourier Descriptors**  
Atul Sajjanhar (Deakin University, Australia), Guojun Lu, Dengsheng Zhang (Monash University, Australia)
2. **A Real-Time 2-D Pattern Recognition using Spatial Circular Cross-Correlation**  
Zoubir Hamici (Amman University, Jordan)
3. **Comparative Experiments on Clustering Validities**  
Crystal Z. Huang and Carl G. Looney (University of Nevada, Reno, USA)

**SESSION 9B:****DATA COMMUNICATION I**

Saturday, March 20, 10:00 a.m. - 11:40 a.m., San Juan Room  
Session Chair: Dr. Bidyut Gupta, Southern Illinois University

1. **An Efficient Multicast Routing Scheme For Cellular Networks**  
Y. Cao, N. Mogharreban (Southern Illinois University, USA), Z. Liu (Southeast Missouri State University, USA), and B. Gupta (Southern Illinois University, USA)
2. **Location Discovery in Ad Hoc Sensor Networks**  
Seungjin Park and Anshu Bhatia (Michigan Technological University, USA)
3. **An Efficient Dynamic Clustering Protocol for MANET**  
V. Doraiswamy, R. Jandhyala, and B. Gupta (Southern Illinois University, USA)
4. **An Object-Oriented Approach to Support Faster Retrieve and Manipulation of Spatial Data**  
M. S. Hossain (Chittagong University, Bangladesh), M. Alamgir and M. S. Hossain (International Islamic University, Bangladesh)

**SESSION 9C:****COMPUTER NETWORKS II**

Saturday, March 20, 10:00 a.m. - 11:40 a.m., Whidbey Room  
Session Chair: Dr. Sergiu Dascalu, University of Nevada, Reno

1. **ImageSpace: an Image Ontology Creation and Annotation Tool for the Semantic Web**  
Rong Huang, Shiyong Lu, and Farshad Fotouhi (Wayne State University, USA)
2. **A Dynamic Intermobile Host Bridging Protocol**  
Elsa Valeroso Poh (Eastern Michigan University, USA) and Jody Grassel (University of North Dakota, USA)
3. **Optimal Trees for the Parametric Fixed Charge Shortest Paths Problem**  
Fred J. Rispoli (Dowling College, USA) and Steven Cosares (Hofstra University, USA)

**11:40 a.m. – 1:00 p.m. LUNCH ON YOUR OWN**

**SESSION 10A:****DATA COMMUNICATION II**

Saturday, March 20, 1:00 p.m. - 2:15 p.m., Bainbridge Room  
Session Chair: Dr. Parimal Patel, The University of Texas at San Antonio

- 1. Cachecast Networks and its Proxy Placement**  
Min-You Wu, Yan Zhu, and Wei Shu (The University of New Mexico, USA)
- 2. A Real-Time Ad Hoc Packet Matching Technique for Hardware-Based Network Intrusion Detection Systems**  
Wei-Ming Lin, Ramu Madhavaram, Parimal Patel, Fred Hudson (The University of Texas at San Antonio, USA)
- 3. Assessment of Compression Effects on Digital Microscopic Images of Tumor Samples**  
Yushan Li, Yuriy Gusev, Zoltan Laszik, Son Do, Daniel Brackett, Yongshen Ni, John Cheung (University of Oklahoma, USA)

**SESSION 10B:****IMAGE PROCESSING IV**

Saturday, March 20, 1:00 p.m. - 2:15 p.m., San Juan Room  
Session Chair: Dr. Wei Shu, The University of New Mexico

- 1. Contrast-detail Analysis of a CMOS-based Digital X-ray Imaging System**  
Qirong Zhang, Yuhua Li, Ben Steele (University of Oklahoma, USA), Wei R. Chen (University of Central Oklahoma, USA), Xizeng Wu (University of Alabama at Birmingham, USA), John Cheung, and Hong Liu (University of Oklahoma, USA)
- 2. On Estimation Of 3D Hand Position Using Stereo Vision**  
M. B. Teruel, O. Kubushyna, R. El-khater, E. A. Yfantis (University of Nevada Las Vegas, USA) and R. Boyle (NASA Ames Research Center, USA)