Computer and Information Science Department

Annual Report
AY 2007-2008

Prepared by
Boleslaw Mikolajczak
September 30, 2008
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Summary

This annual report for AY 2007-2008 presents Computer and Information Science (CIS) Department faculty activities in scholarship such as publications, grants, and supervision of graduate projects and theses. It also presents faculty professional activities in areas such as conference, workshop, and seminar presentations, participation in conferences’ organization, in professional organizations, and in reviewing scholarly activities of peers. We also report on faculty service to the University and faculty public service.

In order to put this report in perspective it should be noted that the CIS Department faculty members, in addition to supervising two Master’s Projects and/or two Master’s Theses, teach two different computer science courses per semester or four different computer science courses per year. At least one course per year is on the graduate level.

The CIS Department had, during AY 2007-2008, twelve full-time tenure-track and tenured faculty members, three part-time lecturers, seven full-time graduate teaching assistants, two professional technicians, and two persons of administrative support. One faculty had a semester-long leave of absence. We served circa 140 undergraduate computer science majors and 65 graduate computer science majors. We also provided instructions in computing for the whole UMASS Dartmouth community. We graduated circa 20 undergraduate computer scientists and 25 graduate computer scientists.

CIS Department faculty members specialize in three broad areas of computing:

a) **Software Development and Engineering** – Dr. Jan Bergandy, Dr. Paul Bergstein, Dr. Boleslaw Mikolajczak, Prof. Richard Upchurch, Dr. Gaoyan Xie, and Dr. Haiping Xu

b) **Intelligent Information Systems (Artificial Intelligence)** – Dr. Ramprasad Balasubramanian, Dr. Iren Valova, Dr. Xiaoqin (Shelley) Zhang

c) **Computer Networks and Systems** – Dr. Emad Aboelela (until Dec. 31, 2007), Dr. Michael Geiger, Dr. Vinod Vokkarane

During AY 2007-2008 our faculty published 10 journal papers, 24 refereed conference papers, and 1 technical report. Our faculty received 11 external grants totaling circa $896,132. They also received 14 UMASS Dartmouth grants totaling $60,136. During AY 2007-2008 our faculty supervised and completed 19 Master’s Theses and 15 Master’s Projects in computer science.

The CIS Department offered Computer Science Seminar Series during AY 2007-2008 with both external and internal speakers. The Seminar Series was partly supported by a grant from the Provost’s office.

In March 2007 UMASS Dartmouth approved a **Software Engineering Option** within the undergraduate Computer Science major. We started offering the new program beginning Fall 2007. Since Spring 2005 we have successfully offered a BS/MS Option in Computer Science for qualified computer science majors. These two programmatic offerings will well serve the computer industry that, according to published national data, strives for highly qualified software engineers both on BS and MS level.

We offered for the first time four new computing courses: **CIS 160 Exploring Programming with Animation**, **CIS 220 Advanced Web Site Development**, **CIS 466 Introduction to Mobile Robotics**, and **CIS 602 Special Topics in Computer Science: Software Testing and Verification**.
1. Faculty Publications

1.1 Journal Publications


1.2. Refereed Conference Publications


### 1.3. Poster Presentations


### 1.4. Technical Reports

2. Faculty Grants

2.1. External Grants


2. Cooperative Salvo for Autonomous Vehicles, Office of Naval Research, Award Number: N00014-06-1-034, PI: Ramprasad Balasubramanian, Co-PI: Christiane Duarte, NUWC, Award: $74,005.78.


4. NeTS-NBD Collaborative Research: SOON: Service-Oriented Optical Networks, NSF, PI: Vinod Vokkarane Other PI: Jason Jue (University of Texas at Dallas), UMass Dartmouth Share, $204,488), 09/01/06-08/31/09.


6. NSF-REU supplement, SOON project, NSF, $24,000 PI: Vinod Vokkarane, 09/01/06-08/31/08.


2.2. Internal Grants


2. **Ramprasad Balasubramanian (PI), Automatic Detection of Oceanic Eddies in SeaWiFS-Derived Color Images Using Neural Networks and Shape Analysis**, IEEE IGARSS 2008 Boston, MA. July 5-8 2008, Award **$500**, Provost’s Travel Award.

3. **Ramprasad Balasubramanian: (PI), Detecting Upwelling Regions Using Clustering on SST Images of Monterey Bay.** Presentation at Ocean Sciences Meeting, Orlando, Florida, March 2-7, 2008, Award **$500**, Provost’s Travel Award.

4. **Boleslaw Mikolajczak: (PI), $1,000 - two travel grants of $500 each from Provost to support conference travel and presentations.**

5. **Boleslaw Mikolajczak: (PI), $1,000 - publication grant from Provost to support journal publication in Journal of Computers, 2008.**

6. **Boleslaw Mikolajczak: (PI). $1,000 - grant from Provost to support Computer Science Seminar Series during AY 2007-2008.**


9. **Iren Valova:(PI), CTE Summer Teaching Institute, CTE Initiative, **$3,000, 1 year.**

10. **Iren Valova: (PI), CTE Teaching and Learning Community for Accomplished Faculty, CTE Initiative, $800, 1 year.**


12. **Haiping Xu (PI), Research Seed Initiative Fund (RSIF III), Agent-Based Trustworthy Service-Oriented Architecture, College of Engineering, $10,000, July 2007 – June 2008.**

13. **Haiping Xu (PI), Provost’s Travel Grant, conference presentation at SEKE 2007, $500, July 2007.**

14. **Haiping Xu (PI), Provost’s Travel Grant, conference presentation at SEA 2007, $500, November 2007.**
3. Faculty Professional Activities

3.1. Conference Presentations


5. Vokkarane, V., iLearn: Internet-based Active Environment, University of Massachusetts Instructional Technology Conference (ITC 2008), Boxboro, MA, April 11, 2008.


3.2. Conference Organizations

Iren Valova:
- Organizing committee member, Circuits, Signals and Systems 2008, IASTED Conference.
- Organizing committee member, Artificial Neural Networks in Engineering 2008, (ANNIE) Conference.

Vinod Vokkarane:
- Conference/Workshop Chair/Member, GRID over Optical Burst Switching Networks (GOBS) 2008, Gosier, Guadeloupe.
- Student Travel Award Chair/Co-Chair, IEEE INFOCOM 2008, Phoenix, AZ.
- Publicity Chair/Co-Chair, 17th IEEE International Conference on Computer Communications and Networks (ICCCN2008), Optical Network Symposium, Virgin Islands, US.
- Session Chair, IEEE/CreateNet BROADNETS 2007, Raleigh, NC Committee Member, Eighth Intl. IEEE/CreateNet Workshop on Optical Burst/Packet Switching (WOBS) 2008.
**London, UK.**

- Committee Member, IEEE GLOBECOM 2008 optical Networks and Systems Symposium, New Orleans, LA.
- Committee Member, IEEE ICCCN 2008 Optical Networking Track, Virgin Islands, US.
- Committee Member, IEEE/CreateNet BROADNETS 2008 - Optical Committee, Networks and Systems Symposium, London, UK.
- Committee Member, IEEE ICC 2008 - Optical Networks and Systems Symposium, Beijing, China.
- Committee Member, IEEE INFOCOM 2008 High-Speed Networks Workshop (HSN 2008), Phoenix, AZ.

**Haiping Xu:**

- Program Committee Co-Chair: International Conference on Software Engineering Theory and Practice (SETP-08), July 2008, Orlando, FL, USA.
- Session Chair: International Conference on Software Engineering and Applications (SEA 2007), Cambridge, Massachusetts, USA, November 2007.
- International Program Committee: 11th International Conference on Software Engineering and Applications (SEA 2007), Cambridge, Massachusetts, USA, November 2007.
- Program Committee: 10th International Conference on Enterprise Information Systems (ICEIS 2008), Barcelona, Spain, June 2008.
- Program Committee: 3rd International Conference on Software and Data Technologies (ICSOFT 2008), Porto, Portugal, July 2008.
- International Program Committee: 12th International Conference on Software Engineering and Applications (SEA 2008), Orlando, Florida, USA, November 2008.

### 3.3. Other Activities

**Boleslaw Mikolajczak:**


- Member of the Advisory Board for the CIS Department at Bristol Community College, since AY 2001-2002 – 2 meetings attended + consultation on board-related issues with Priscilla Grocer, chair of the CIS Department at BCC.

- Member of the Higher Education Advisory Committee of the BHE CITI ITAC Grant (Information Technology Across Curriculum).
Haiping Xu:

Iren Valova:
- Reviewer for the following conferences: ANNIE, ICMLA, IASTED, CS, IASTED SIP.

Xiaoquin (Shelley) Zhang:
- Program committee member for the IEEE/WIC/ACM International Conference on Intelligent Agent Technology in Year 2007 (IAT-07), reviewed CIS papers.

Vinod Vokkarane:
- Reviewer Journal of Communications and Networks.
- Reviewer IEEE Transactions on Communications.
- Reviewer IEEE Communications Magazine.
- Reviewer Elsevier Optical Switching and Networking Journal.
- Refereed IEEE International Conference on Communications (ICC) 2008.
- Visiting Scholar Advisor: Balagangadhar Bathula, Indian Institute of Science, Bangalore, Service-Oriented Optical Networks.
- Ph.D. External Committee Member: Richard Surendrakumar, University of Ottawa, Design Issues in the Next Generation Wavelength Division Multiplexed Optical Network.
- Ph.D. Committee Member: Ruiping, Ma (ECE), *Reliability and Security in Wireless Sensor Networks*. 
4. Professional Honors

Ramprasad Balasubramanian:
- iLearn: Internet-based Active Learning Environment – Honorable Mention for Poster Presentation at the UMass IT Matters Instructional Technology Conference.

Boleslaw Mikolajczak:
- Member of the Editorial Board - International Journal of Engineering, India
- Member of the Program Committee of the International Conference PITA’2007 – Principles of Information Technology and Applications, October 15-17, 2007, Wisla, Poland; reviewed 6 conference papers.
- Member of the Program Committee of the International Conference on Information Technology New Generations ITNG’2008, April 7-9, 2008, Las Vegas, NV, USA.
- Member of the Program Committee of the International Conference HEALTHINFO’2007 – reviewed 8 papers in application of workflow management systems in healthcare industry.
- Reviewer to the NERC of Canada – by invitation.
- Presented invited lectures concerning Petri net modeling and analysis of inter-organizational workflows to graduate computer science students at the Polish-Japanese Information Technology Institute in Warsaw, Poland, January 7-13, 2008.

Iren Valova:
- Invited to serve as a reviewer to the Dutch National Science Foundation on neural network learning.

Vinod Vokkarane:
- Member of the Advisory Board for - PRLightCOM Broadband Solutions (pvl) Limited.
- Provost’s Travel Award, University of Massachusetts Dartmouth, Spring 2007 ($1,000).

Haiping Xu:
5. Professional Membership

Boleslaw Mikolajczak:
• Member of IEEE Computer Society.
• Member of Association for Computing Machinery.

Iren Valova:
• Member of IEEE Computer Society.

Haiping Xu:
• Elected Senior Member of the IEEE in October 2007.
• Professional Member of the Association of Computing Machinery (ACM).
• Member of the American Federation of Teachers (AFT).

Vinod Vokkarane:

Xiaoqin (Shelley) Zhang
• Member of American Association for Artificial Intelligence (AAAI)

6. Service to the University

6.1. CIS Department

Accreditation and Assessment Committee: Ram Bala (chair), Paul Bergstein, Richard Upchurch, Emad Aboelela (loa).

Computer Game Design Club: Iren Valova (chair).

Computer Science Industrial Advisory Committee: Boleslaw Mikolajczak.

COOP Coordinator: Ramprasad Balasubramanian.

Faculty Evaluation Committee: Ramprasad Balasubramanian, Jan Bergandy, Paul Bergstein, Boleslaw Mikolajczak(non-voting ) (chair), Iren Valova.

Freshman Advisors: Ramprasad Balasubramanian, Paul Bergstein, Iren Valova, Xiaoqin (Shelley) Zhang.

Graduate Curriculum Committee: Jan Bergandy (chair), Vinod Vokkarane, Iren Valova, Gaoyan Xie, Haiping Xu, Xiaoqin (Shelley) Zhang.

Graduate Program Assessment Sub-Committee: Paul Bergstein, Iren Valova.

Laboratory Committee: Ramprasad Balasubramanian (chair), Miles Ercolani, Michael Geiger, Paul Naylor, Richard Upchurch, Vinod Vokkarane, (Emad Aboelela loa).

Library Liaison: Boleslaw Mikolajczak, Vinod Vokkarane, Gaoyan Xie.
Linux User Group Advisor: Ramprasad Balasubramanian.

Professional & Continuing Education Committee: Boleslaw Mikolajczak

Search and Screen Committee: Jan Bergandy, Iren Valova (chair), Paul Bergstein, Boleslaw Mikolajczak.

Seminar Series: Boleslaw Mikolajczak, Xiaoqin (Shelley) Zhang.

Student Chapter Advisors: Ramprasad Balasubramanian, Iren Valova, Xiaoqin (Shelley) Zhang

Survey Task Force: Ramprasad Balasubramanian, Miles Ercolani, Vinod Vokkarane.

Undergraduate Curriculum Committee: Ramprasad Balasubramanian, Jan Bergandy, Paul Bergstein (chair), Michael Geiger, Iren Valova, Haiping Xu, Xiaoqin (Shelley) Zhang.

Web Committee: Ramprasad Balasubramanian, Miles Ercolani, Vinod Vokkarane (chair).

6.2. College of Engineering

Bioengineering Program Committee (CIS Representative): Iren Valova

COE Academic Council: Ramprasad Balasubramanian, Iren Valova.

COE Administrative Council: Boleslaw Mikolajczak.

COE Advising Task Force: Ramprasad Balasubramanian.

COE Curriculum Committee: Paul Bergstein.

COE Web Committee: Vinod Vokkarane.


Participated in COE meetings for recruitment of women in the field of engineering: Iren Valova.

Scholarship Committee: Iren Valova.
6.3. UMass Dartmouth

**Ramprasad Balasubramanian**: Participant Faculty Federation/Senate Task Force; COE Representative to the Leo M. Sullivan Teacher of the Year committee; SWOT member-University Strategic Plan Committee

**Boleslaw Mikolajczak**: UMD Strategic Plans 2008 – worked with Provost Garro on a proposal of Information Technology minor and Bioinformatics minor; participated in University-wide chairs’ meetings with president of the Faculty Federation; participated in Undergraduate and Graduate Commencement ceremonies; UMD Faculty Senate member; Cultural Affairs Committee member of the Faculty Senate.

**Iren Valova**: Participant- UMD Committee on Women.

**Xiaoqin (Shelley) Zhang**: Member University Curriculum Committee.

**Haiping Xu**: Member Faculty Senate Committee, Library Committee, UMD Faculty Federation
7. Public Service

Jan Bergandy:

- Member of the Tiverton School Board (one of five Board members)
  - Responsibilities are similar to those of a Board of Trustees. The charter of the Board states: “They (the members) should be prepared and willing to devote a sufficiently large amount of time to the study of problems of education in their own district, as well as the State and Nation at large, so as to be able to interpret them to the electorate of this district.”
  - The Board is responsible for reviewing and approving any changes to the programs, review and development of policies governing the School System in Tiverton, approving all and any personnel actions in the System, performance review and appointment of the Superintendent of Schools, preparing and presenting to the Town the annual budget for the School System (in the range if 25 million dollars).
  - Negotiations of the contract with the teacher’s union.
  - The Board meets at least twice a month for several hours.

- Member of the Policy Subcommittee of the Tiverton School Board (2 Board members + Superintendent of Schools)
  - Responsible for review and development of policies governing the School System in Tiverton. New policies or policy changes are presented to the entire School Board for approval.
  - Voting Member of the Tiverton Elementary Schools Building Committee (sub-committee of Tiverton School Committee) – continuation from previous year (four year project).
  - Oversight on behalf of Town of Tiverton of the building of one new elementary school (completed) and major reconstruction of two more elementary schools (in progress). Project involves revamping of the entire elementary schools system in town (20+ million dollars budget).
  - Assessment of programs and needs of elementary school education including State and Federal mandates.
  - Preparing and disseminating information to the town community.

- Member of the Executive Committee of the Rhode Island School Committee’s Association (nominated and elected in 2008). This Board interacts with the Board of Education of the State of RI on public education policies review/development. RISCA Charter: “RIASC is dedicated to training and improving the effectiveness of school committee members in meeting their roles and responsibilities to students, parents, administrators, and taxpayers, while playing a lead in shaping and advocating public education at state and national levels.”
## 8. Master’s Projects and Theses

### 8.1 Master’s Projects

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<td>A Testing Tool for the Deterministic Testing of Multithreaded Java Programs</td>
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<td>Christopher Bates</td>
<td>Rule-Based Specification of Flexible Bidding Strategies in Agent-Based Online Auctions</td>
</tr>
<tr>
<td>Derek Beaton</td>
<td>A Neural Network Based-System for Classification of EEG Data Correlating to Neural or Cognitive Impairment</td>
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<td>Anik Goel</td>
<td>Evaluation of a Bayesia Network with Multi-State Nodes for Shill Verification In Online Auction</td>
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<tr>
<td>Harrison Ho</td>
<td>UML Design of a Bank Card Reader System – A Case Study</td>
</tr>
<tr>
<td>Brinda Kommireddi</td>
<td>Developing a Dynamic Virtual Restaurant Using RML</td>
</tr>
<tr>
<td>Ni Na</td>
<td>Improvement of Two Geospatial Algorithms in LBTAQU</td>
</tr>
<tr>
<td>Deepak Padmanabhan</td>
<td>Split-Connection Approach to Improve TCP Performance Over Optical Burst-Switched Networks</td>
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<tr>
<td>Sravan Patti</td>
<td>Implementing Ontology-Based Dynamic Service Discovery in JavaSpaces</td>
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<tr>
<td>Nikhil Shinde</td>
<td>GIS Connectivity to JC31EDM for Mobile Target Applications</td>
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<tr>
<td>Danielle Stack</td>
<td>Building Tutorial Agent With Knowledge Base for UVLDS</td>
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<tr>
<td>Shiva Vadla</td>
<td>E-Commerce Application for Mobile Devices</td>
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<tr>
<td>Rahul Vishen</td>
<td>Vision Based Docking System for Autonomous Mobile Robotics</td>
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<td>Host-based Intrusion Detection System using System Call Monitoring</td>
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<td>Derek Beaton</td>
<td>Bridging Turing Unorganized Machines and Self-Organizing Maps For Cognitive Replication</td>
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<tr>
<td>Rahul Bollampally</td>
<td>NxGen: Sketching Next Generation Interfaces</td>
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<tr>
<td>Deepak Chandran</td>
<td>Toward Reliable Optical Burst-Switched Networks Using Forward Segment Redundancy</td>
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<tr>
<td>Pavachand Chavali</td>
<td>Coverage-Based Test Case Generation For Sequential And Concurrent Systems Using Model Checking</td>
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<tr>
<td>John Hammond</td>
<td>A Framework for Scaling the ParaSOM Self-Organizing Map Over</td>
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<tr>
<td>Deepti Jain</td>
<td>Energy-Efficient Target Monitoring In Wireless Sensor Networks</td>
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<tr>
<td>Nidhi Jain</td>
<td>Dual-Homing Protection In Hierarchical Wireless Sensor Networks</td>
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<tr>
<td>Aashay Joshi</td>
<td>Transformation Of Unified Modeling Language Models Into Colored Petri Net Models</td>
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<td>Binsan Khadka</td>
<td>Transforming Live Sequence Charts to Colored Petri Nets</td>
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<td>Bharat Komatireddy</td>
<td>TCP Performance Analysis Using Congestion-Based Load Balanced Routing in Optical Burst Switching</td>
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<tr>
<td>Daniel MacLean</td>
<td>Clustering and Classification for a Parallel Self-Organizing Map</td>
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<td>Harish Nagelly</td>
<td>Automatic Web Service Composition to Support Complex User Goals</td>
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<td>Ari Packer</td>
<td>Architecture and Algorithms to Support Cooperation Among Autonomous Undersea Vehicles</td>
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<td>Bhumit Patel</td>
<td>The study of Initial Commitment Decision Problem and Crisis Management in Multi-Agent Virtual Organizations</td>
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<td>Pranita Prabhudes</td>
<td>An Incremental Black-Box Testing Approach For Component-Based Systems</td>
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<tr>
<td>Ryan Robidoux</td>
<td>Automated Verification of a Computer System Reliability Model</td>
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<td>Bhavesh Shrestha</td>
<td>Automated Agent Generation and Coordination In Multi-Agent Systems</td>
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<tr>
<td>Danielle Stack</td>
<td>Building Intelligent User Interface Agent for Underwater Vehicle Launch Dynamics Simulation</td>
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### 9. Seminar Presentations

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<td>The Next Generation of Content Repositories</td>
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<td>Dr. Meinolf Sellmann</td>
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<td>Brown University</td>
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<td>Dr. Pawel Siwak</td>
<td>On iterons of automata</td>
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<td>Dr. Chris Jones</td>
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<td>iRobot Corporation</td>
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<td>Dr. Iren Valova</td>
<td>Olfactory Bulb Neurotransmitter Studies and Simulations</td>
<td>CIS Faculty</td>
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<td>Dr. Eric Braude</td>
<td>Cumulative Subgoal Fulfillment in Software Development</td>
<td>Boston University</td>
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<tr>
<td>Erion Plaku Ph.D candidate, Rice U.</td>
<td>Toward Autonomous Robotics: From High-Level Tasks to Low-Level Motions</td>
<td>Rice University</td>
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<td>Dr. Shelley Zhang</td>
<td>Multi-agent System Development</td>
<td>CIS Faculty</td>
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<td>Yijuan Lu, Ph.D candidate, U.T.</td>
<td>Discriminant Analysis and Concepts Learning for Large-scale Image Database</td>
<td>University of Texas</td>
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<td>Amarda Shehu, Ph.D candidate, Rice U.</td>
<td>Molecules in Motion: Computing Structural Flexibility</td>
<td>Rice University</td>
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<td>Dr. Boleslaw Mikolajczak</td>
<td>Correctness of Inter-organizational Loosely Coupled Workflows</td>
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<td>Dr. Ugur Cetintemel</td>
<td>Data-Stream Processing and Storage for Scientific and Intelligence Applications</td>
<td>Brown University</td>
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