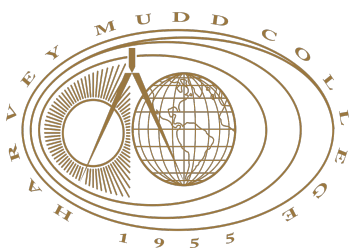


# NSF CISE and OCI REU Sites PI Meeting 2011



March 17-18, 2011  
Pasadena, California



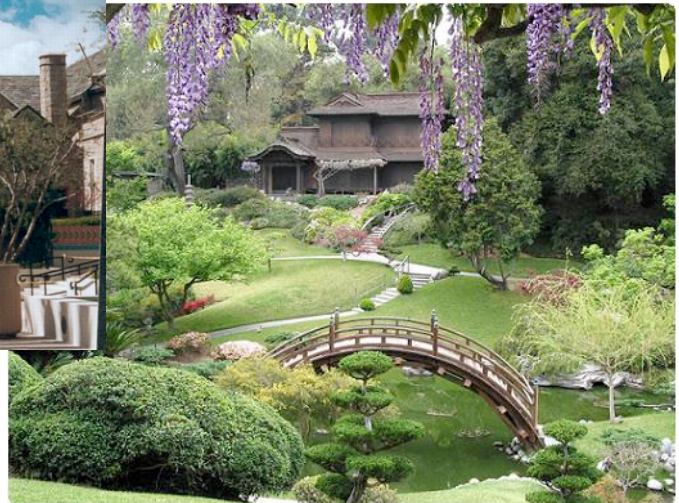
<http://www.cisereupi.org>

# Table of Contents

Welcome (and contact information)	Page 3
Meeting Schedule	Page 4
Thursday Morning Excursions	Page 5
NSF Staff	Page 6
Meeting Participants	Page 7
Friday Keynote Speaker, Maja Mataric	Page 9
Friday Guest Panel on Diversity	Page 10
Hotel Map	Page 11
Pasadena Map	Page 12
Participants' Slides (sorted by institution name)	Page 13



Pasadena City Hall



Huntington Gardens, Pasadena

# Welcome to the 2011 NSF CISE REU PI Meeting

We are delighted to welcome you to the 2011 NSF CISE REU PI meeting in Pasadena. The objectives of this meeting are to share best practices, learn about initiatives that are likely to benefit our sites and their participants, and to foster a community that can work together for the mutual benefits of the REU sites.

While many people contributed to the planning of this meeting, we wish to particularly express our gratitude to Harriet Taylor and Joan Peckham at NSF, to our two energetic academic organizing committee members Teresa Dahlberg and Richard Hughey, and to our planning assistant Kris Graham. We also thank our guest speakers and panelists and, indeed, all of you for your participation. Finally, we thank the National Science Foundation for generous support for this meeting under grant NSF CNS-0753306.

If you have questions or concerns, please don't hesitate to let us know. We are here to do everything we can to make this a successful and productive meeting.

Ran "RON" Libeskind-Hadas  
Melissa O'Neill

2011 CISE REU PI Meeting Co-Directors  
Harvey Mudd College, Department of Computer Science



Contact during conference:  
Kris Graham, Conference Assistant:  
909-538-5612 (cell)  
pimeeting@cs.hmc.edu

Ran:  
909-964-7562 (cell)  
ran@cs.hmc.edu

Melissa:  
oneill@cs.hmc.edu

Questions regarding logistics, finances, etc. can be sent anytime to [pimeeting@cs.hmc.edu](mailto:pimeeting@cs.hmc.edu)

# Meeting Schedule

The main conference venue is on the 2<sup>nd</sup> level, Fountain Ballroom  
Meetings in Fountain Ballroom III and IV, meals in I and II

## Thursday

Registration/information table staffed from 7:30 AM to 5:30 PM

7:30-8:30 AM: Continental breakfast (Fountain Ballroom I and II)

8:45 AM: Meet in hotel lobby for Caltech and Huntington visits

9 AM - noon: New PI Session (by invitation), Fountain Ballroom (III and IV)

*Conference begins at noon with opening remarks.*

noon- 1:00 PM: Lunch (Fountain Ballroom I and II)

1:15 - 2:30 PM: One-minute madness

2:30 - 3:30 PM: PI Panel: “The Challenge of Research at an REU Site”  
(Pamela Abshire, Richard Hughey, Nicholas Kraft, Aaron Striegel)

3:30 - 4:00 PM: Social break

4:00 - 5:00 PM: Breakout session 1 (see p. 11 for locations)

5:00 - 5:30 PM: Breakout summaries

6 :00- 7:30 PM: Dinner at hotel (Fountain Ballroom I and II)

## Friday

7:30 - 8:30 AM: Breakfast (Fountain Ballroom I and II)

8:30 - 9:30 AM: Coordinating with NSF Program Officers

9:30-10:30 AM: Assessment and Tools (Audrey Rorrer)

10 - 10:45 AM: Social break

10:45 - noon: “Why Student Mentoring is Irresistible and How to Make  
its Lessons Stick”: Keynote by Prof. Maja Mataric, USC (see p. 9)

noon -1:00 PM: Lunch (Fountain Ballroom I and II)

1:15 - 2:15 PM: “The Impact of REUs on Enhancing Diversity”  
(Angela Gallegos, Ed Mosteig, David Uminsky, Dagan Karp, see p. 10)

2:15 -3:15 PM: Breakout session 2 (see p. 11 for locations)

3:15 - 3:45 PM: Social break

3:45 - 4:15 PM: Breakout summaries

4:15 - 5:00 PM: Preparing a successful renewal proposal (H. Taylor and J. Peckham)

5:00 - 5:15 PM: Conclusions, looking to next year

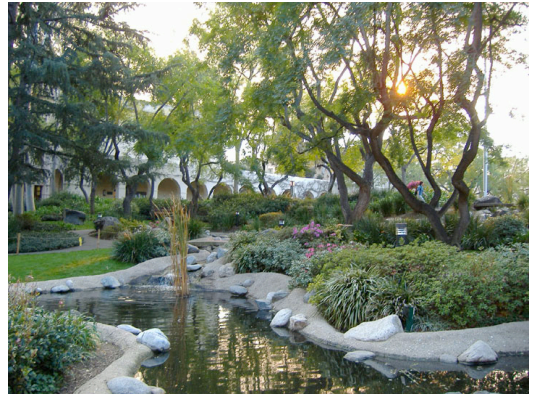
6 PM: Meet in hotel lobby to walk to restaurant (or meet us there!)

6:30 PM: Dinner at Il Fornaio (24 West Union Ave.)

# Thursday Morning Excursions

## Caltech Visit

Participants in the visit to Caltech will meet with Professor Erik Winfree (DNA computation, self-assembly, fault-tolerant molecular computing), Professor Mathieu Desbrun (computer graphics), and Ms. Candice Rypisi, director of Caltech's Summer Undergraduate Research Fellowship program.



## Huntington Botanical Gardens

Participants will get a private tour of the famous gardens and library established by Henry E. Huntington, one of the “Big Four” who established the Central Pacific Railway – one of two transcontinental railways completed in 1869. The 120 acre complex contains several themed gardens with rare plants from around the world. The desert garden has one of the oldest and largest collections of cacti in the world. The complex also houses the Huntington Library which is a repository of rare books and manuscripts that attracts scholars from around the world.



# NSF Staff

Harriet Taylor  
Program Director, CISE/CNS  
htaylor@nsf.gov



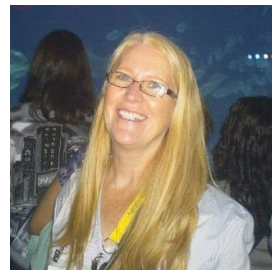
Joan Peckham  
Program Director, OCI  
jpeckham@nsf.gov



Sven Koenig  
Program Director, CISE/IIS  
skoenig@nsf.gov



Brenda Gardunia  
Einstein Fellow, CISE/CNS  
bgardunia@nsf.gov



Joseph Urban  
Assistant Division Director, CISE/CNS  
jurban@nsf.gov



# Participants

(Page 1 of 2)

Thursday/Friday

Breakouts

(See key on next page)

Name	Th	Fr	Email	Institution
Abshire, Pamela	MU	DR	pabshire@umd.edu	Univ. of Maryland, College Park
Adrion, W. R. (Rick)	FP	RT	adrion@cs.umass.edu	University of Mass Amherst
Bashir, Masooda	AE	SE	mnb@illinois.edu	University of Illinois UC
Biaz, Saad	TR	RT	biazsaa@auburn.edu	Auburn University
Bischof, Hans-Peter	MU	A	hpb@cs.rit.edu	Rochester Institute of Tech
Bose, Tamal	TS	A	tbose@vt.edu	Virginia Tech
Brylow, Dennis	TR	FT	brylow@mscs.mu.edu	Marquette University
Chandy, John	AE	IC	john.chandy@uconn.edu	University of Connecticut
Chen, Ping	L	IO	chenp@uhd.edu	University of Houston-Downtown
Chen, Huimin	MU	RT	hchen2@uno.edu	University of New Orleans
Cukier, Michel	TR	IC	mcukier@umd.edu	University of Maryland
Dahlberg, Teresa	AE	DR	Teresa.Dahlberg@uncc.edu	UNC Charlotte
Dietterich, Thomas	TR	SE	tgd@cs.orst.edu	Oregon State University
Dodds, Zach	GE	SE	dodds@cs.hmc.edu	Harvey Mudd College
Eastman, Caroline	TS	IC	eastman@cec.sc.edu	University of South Carolina
Fay-Wolfe, Victor	GE	RW	wolfe@cs.uri.edu	University of Rhode Island
Fiorini, Eugene	MU	IC	gfiorini@dimacs.rutgers.edu	Rutgers University
Fu, Huirong	TS	A	fu@oakland.edu	Oakland University
Fuentes, Olac	L	SE	ofuentes@utep.edu	University of Texas at El Paso
Furst, Jacob	TR	IO	jfurst@cdm.depaul.edu	DePaul University
Gao, Byron	L	DR	bgao@txstate.edu	Texas State Univ San Marcos
Gilbert, Stephen	E	RW	gilbert@iastate.edu	Iowa State University
Hodges, Larry	MU	RT	lfh@clemson.edu	Clemson University
Huang, Stephen	TR	SE	shuang@cs.uh.edu	University of Houston
Hughey, Richard	E	DR	rph@soe.ucsc.edu	University of Cal. Santa Cruz
Humphreys, Sheila	TS	A	humphrys@eecs.berkeley.edu	UC Berkeley
Jipping, Michael	AE	DR	jipping@hope.edu	Hope College
Kalita, Jugal	AE	FT	kalita@eas.uccs.edu	University of Colorado
Kraft, Nicholas	FP	FT	nkraft@cs.ua.edu	The University of Alabama
Labrador, Miguel	MU	A	labrador@cse.usf.edu	University of South Florida
Larson, Susan	MU	RT	smlarson@illinois.edu	University of Illinois at UC
Lee, Byeong	FP	A	byeong.lee@utsa.edu	University of Texas at San Antonio
Levy, Julie	L	IO	jlevy@austin.utexas.edu	University of Texas at Austin
Lewis, Mike	TR	IO	mlewis@cs.binghamton.edu	Binghamton University (SUNY)
Li, Longzhuang	GE	IO	Longzhuang.Li@tamucc.edu	Texas A&M -Corpus Christi
Libeskind-Hadas, Ran	AE	RT	hadas@cs.hmc.edu	Harvey Mudd College
Lobo, Niels	FP	IO	niels@eecs.ucf.edu	University of Central Florida
Mahmud, Syed	TS	A	smahmud@eng.wayne.edu	Wayne State University
Makki, Kami	AE	RT	kami.makki@lamar.edu	Lamar University
Meghanathan, Natarajan	TR	A	natarajan.meghanathan@jsums.edu	Jackson State University

# Participants

Thursday/Friday  
Breakouts  
(See key below)

(Page 2 of 2)

Name	Th	Fr	Email	Institution
Moreno, Juana	E	SE	moreno@lsu.edu	Louisiana State University
Musser, Dale	MU	FT	musserda@missouri.edu	University of Missouri
Nabrzyski, Jaroslaw	GE	RW	naber@nd.edu	University of Notre Dame
O'Neill, Melissa	TR	DR	melissa_oneill@hmc.edu	Harvey Mudd College
Parsons, Simon	E	SE	parsons@sci.brooklyn.cuny.edu	Brooklyn College, City Univ NY
Paruchuri, Vamsi	TS	RW	vparuchuri@uca.edu	University of Central Arkansas
Peng, Jing	AE	RW	jing.peng@montclair.edu	Montclair State University
Pissinou, Niki	TS	A	pissinou@fiu.edu	Florida Int. University
Richards, Howard	L	IC	Howard.Richards@Marshall.edu	Marshall University
Rorrer, Audrey	TS	A	audrey.rorrer@uncc.edu	UNC Charlotte
Shah, Mubarak	FP	RT	shah@cs.ucf.edu	University of Central Florida
Shirazi, Behrooz	L	RW	shirazi@wsu.edu	Washington State University
Sklar, Elizabeth	AE	FT	sklar@sci.brooklyn.cuny.edu	Brooklyn College, City Univ of NY
Sridharan, Mohan	FP	FT	mohan.sridharan@ttu.edu	Texas Tech University
Stefanescu, Dan	GE	RW	dcstefanescu@gmail.com	Suffolk University
Stone, Matthew	E	SE	matthew.stone@rutgers.edu	Rutgers University
Striegel, Aaron	GE	FT	striegel@nd.edu	University of Notre Dame
Taskin, Baris	E	IO	taskin@coe.drexel.edu	Drexel University
Thede, Scott	TS	RW	sthede@depauw.edu	DePauw University
Uehara, Wesley	L	SE	wuehara@cens.ucla.edu	UCLA
Urban, Susan	GE	FT	susan.urban@ttu.edu	Texas Tech University
Vishwanath, Sriram	FP	RT	sriram@ece.utexas.edu	University of Texas
Winchester, Woodrow	TR	DR	wwwinche@vt.edu	Virginia Tech
Wong, Eric	GE	FT	ewong@utdallas.edu	University of Texas at Dallas
Xu, Dianxiang	MU	RW	dianxiang.xu@dsu.edu	Dakota State University
Youn, Jon	TS	IC	jyoun@unomaha.edu	University of Nebraska at Omaha

## Key to Breakout Groups

### Thursday

- FP Matching Students with Faculty and Projects
- L Logistics
- AE Academic Enrichment Activities
- E Ethics
- TR Explicitly Teaching Research Skills
- MU Mentoring Undergraduates
- GE Creating Cohesive Group Experiences
- TS Tracking Student Participants Afterwards

### Friday

- RT Recruiting Tips and Best Practices
- SE Creating a Cohesive Social Experience
- IO What's Your Intended Outcome
- RW Making Undergraduate Research Work
- DR Disseminating Results
- FT Shaping Student Future Trajectories
- IC Institutional Coordination
- A Assessment

## Friday Keynote Presentation

# “Why Student Mentoring is Irresistible and How to Make its Lessons Stick”

## Prof. Maja Mataric, USC

Maja Mataric is a professor of Computer Science, Neuroscience, and Pediatrics at the University of Southern California, founding director of the USC Center for Robotics and Embedded Systems ([cres.usc.edu](http://cres.usc.edu)), co-director of the USC Robotics Research Lab ([robotics.usc.edu](http://robotics.usc.edu)) and Senior Associate Dean for Research in the USC Viterbi School of Engineering. She received her PhD in Computer Science and Artificial Intelligence from MIT in 1994, MS in Computer Science from MIT in 1990, and BS in Computer Science from the University of Kansas in 1987.



Photo by Phil Channing  
[philchanning@cox.net](mailto:philchanning@cox.net)

Prof. Mataric is actively involved in K-12 educational outreach, having obtained federal and corporate grants to develop free open-source curricular materials for elementary and middle-school robotics courses in order to engage student interest in science, technology, engineering, and math (STEM) topics. Her Interaction Lab's research into socially assistive robotics is aimed at endowing robots with the ability to help people through individual non-contact assistance in convalescence, rehabilitation, training, and education. Her research is currently developing robot-assisted therapies for children with autism spectrum disorders, stroke and traumatic brain injury survivors, and individuals with Alzheimer's Disease and other forms of dementia. Details about her research are found at <http://robotics.usc.edu/interaction/>.



Official White House photo by Pete Souza

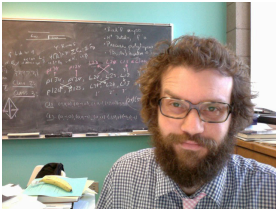
In January 2011, Prof. Mataric was awarded the Presidential Mentoring Award by President Obama recognizing her efforts in mentoring at many levels from K-12 to junior faculty.

## Friday Guest Panel

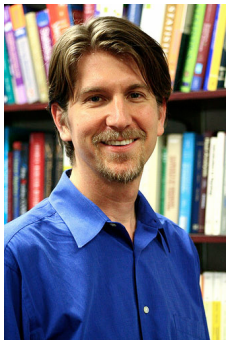
# The Impact of REUs on Enhancing Diversity



**Angela Gallegos** is an Assistant Professor in the Mathematics Department at Occidental College. She received her PhD in 2005 from UC Davis in Applied Mathematics and her BA from New York University in 1999. Angela has long been interested in mentoring and working with undergraduates in research. As an undergraduate she participated in the Summer Program for Women in Math at the George Washington University and has since returned to that program as a Teaching Assistant, an Instructor and a Guest Speaker. She also was a teaching assistant at the Summer Institute in Mathematics for Undergraduates (SIMU) in Puerto Rico in 2002.



**Dagan Karp** is an Assistant Professor of Mathematics at Harvey Mudd College. He received the BS in Mathematics and Physics and MSc in Mathematics from Tulane and the PhD in Mathematics from the University of British Columbia. He was an NSERC Postdoctoral Fellow and later an NSF RTG Visiting Assistant Professor. Dr. Karp's research is centered in algebraic geometry, quantum geometry and Gromov-Witten theory. Dr. Karp is an active member of SACNAS, the Society for Advancement of Chicano and Native Americans in Science, including serving on the SACNAS National Mathematics Task Force. His current goal is creating the Pacific Alliance for Mathematical Baccalaureates, working to broaden participation in the mathematical sciences in Southern California and Hawaii.



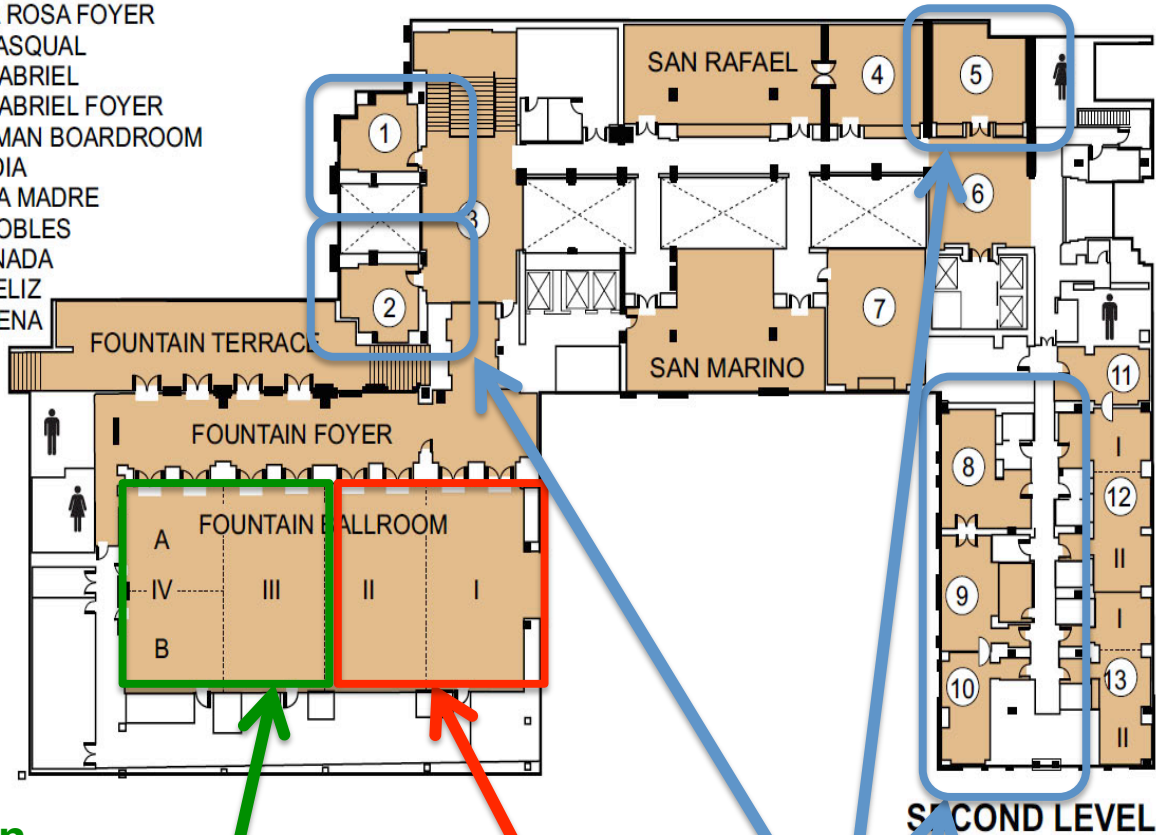
**Ed Mosteig** is an Associate Professor of Mathematics at Loyola Marymount University. Dr. Mosteig received a B.S. in Mathematics from the University of Michigan and an M.S. in Mathematics from the University of Illinois. In 2000, he received his M.S. in Computer Science and Ph.D. in Applied Mathematics from Cornell University. Dr. Mosteig's primary research activities include applications of commutative algebra to problems in coding theory and statistics. Dr. Mosteig has a keen interest in increasing the number of students from underrepresented groups pursuing careers in the mathematical sciences. He has worked with a number of summer research programs that promote this goal at the collegiate level, including the Applied Mathematical Sciences Summer Institute (AMSSI) jointly hosted by Cal Poly Pomona and Loyola Marymount.



**David Uminsky** is an NSF and UC President's Fellow in the Computational and Applied Mathematics group in the Math Department at UCLA. His current research is in the area of mathematical physics and fluid dynamics. He earned his B.Sc. in mathematics at Harvey Mudd College (2003) and his Ph.D. in Mathematics at Boston University (2009). Dr. Uminsky has previously participated in two NSF-funded REU programs - one in Puerto Rico and the other in southern California. He was an undergraduate student at the Summer Institute in Mathematics for Undergraduates and in 2000 and he returned as a graduate student mentor in mathematics for the Applied Mathematical Sciences Summer Institute (AMSSI). Both programs were exceptionally successful in recruiting and training underrepresented students in the mathematical sciences.

# Westin Pasadena Conference Venue (Second Level of the Hotel)

1. SIERRA BONITA
2. SANTA ROSA
3. SANTA ROSA FOYER
4. SAN PASQUAL
5. SAN GABRIEL
6. SAN GABRIEL FOYER
7. LEISHMAN BOARDROOM
8. ARCADIA
9. SIERRA MADRE
10. LOS ROBLES
11. LA CANADA
12. LOS FELIZ
13. ALTADENA



**Main  
Conference  
Meeting Room  
Fountain  
Ballroom III and IV**

**Meals in  
Fountain  
Ballroom  
I and II**

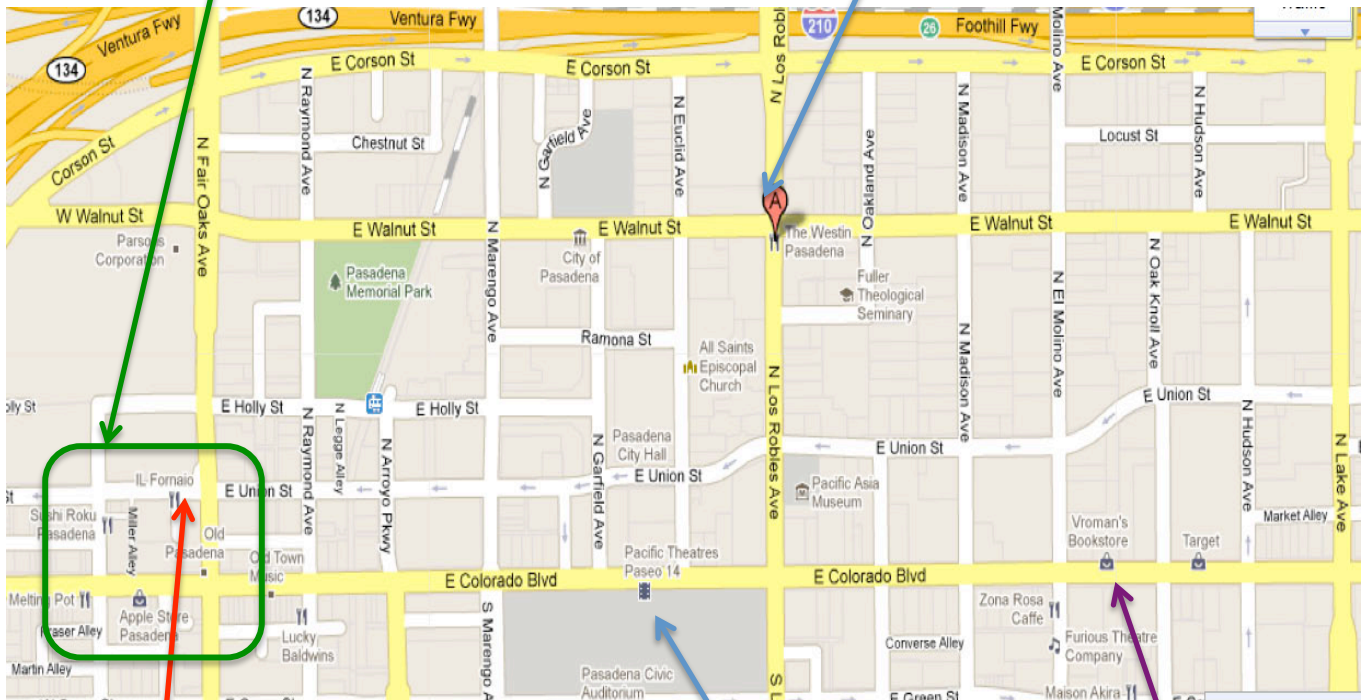
**Breakout rooms  
Arcadia, Sierra Madre,  
Los Robles, San Gabriel,  
Sierra Bonita, Santa Rosa**

# Pasadena Map

## Old Town Pasadena

Night life, cafes, restaurants, Apple Store, etc.

**Westin Hotel**  
191 N. Los Robles Ave



**Il Fornaio Restaurant**  
24 W. Union  
(0.7 miles from hotel)

**Paseo Colorado Shopping Area**  
Outdoor mall with restaurants and shops

**Vroman's Bookstore**  
Large independent bookstore



**Saad Biaz**  
 Smart UAVs  
 Auburn University  
 Auburn, Alabama  
 biaz@auburn.edu

**Research areas of this site:** Autonomous flight, collision avoidance, conflict avoidance, energy efficient flight, ad hoc networking.  
**Site active since:** May 2003



CISE REU PI Meeting, Pasadena, March 2011



**Michael J. Lewis**  
 CSREU@BU: Cloud Computing  
 Binghamton University (SUNY)  
 Binghamton, NY  
 mlewis@cs.binghamton.edu

**Research areas of this site:** Computer architecture, energy-aware computing, virtualization, cloud & grid computing, Internet se image computing, security, algorithms, data mining, mobile & sensor networks.

**Site active since:** 2007

Research Projects  
 individual & team  
 Research Skills  
 e.g. speaking, writing,  
 performance study  
 Fun!



“Create one island, promote camaraderie”



## Elizabeth Sklar & Simon Parsons

**MetroBotics: undergraduate robot research  
at an urban public college**

*Brooklyn College, City University of New York*

Brooklyn, New York

sklar,parsons@sci.brooklyn.cuny.edu

Our **Research** focuses on **Multi-Robot Systems** and **Human-Robot Interaction**.  
 Our project is an **academic year site** and has been active **since Fall 2009**.  
 We are investigating coordination and task allocation in human/multi-robot teams. Our REU Fellows have researched, designed and implemented tools to address a variety of tasks within this domain, including: real-time mapping, learning to avoid obstacles, and object recognition. We have taken students to academic conferences and exhibited in museums.



CISE REU PI Meeting, Pasadena, March 2011

*funding provided by the National Science Foundation  
under grant #CNS-08-51901*

15



## Larry F. Hodges

REU in Human-Centered Computing

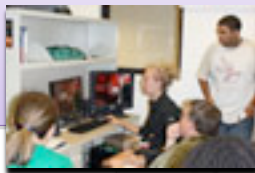
Clemson University

Clemson, SC

lfh@clemson.edu

**Research areas of this site:** Virtual Environments for Training and Education, Multi-Modal Interfaces, Eye-Tracking, Intelligent Virtual Agents

**Site active since:** 2009



**Research**



**Eat**



**Play**



**Present**

CISE REU PI Meeting, Pasadena, March 2011

16



## Dianxiang Xu



Information Assurance and Security  
Dakota State University  
Madison, South Dakota  
dianxiang.xu@dsu.edu

**Research areas of this site:** access control, applied cryptography, computer forensics, data privacy, malware analysis, network security, software security, system security.  
**Site active since:** 2010

### Security Mutation Testing of the Filezilla FTP Server by Daniel Woodraska

- What: Created 38 distinct security mutants according to design- and implementation level problems
- Finding: Security testing with threat models can detect most of the injected vulnerabilities.
- Publication: Conference with a double-blind review; reviewers are interested in getting a copy

### 2010 Fellows



CISE REU PI Meeting, Pasadena, March 2011

17



## Jacob Furst

MedIX  
DePaul University  
Chicago, IL  
jfurst@cdm.depaul.edu

**Research areas of this site:** Medical Informatics  
**Site active since:** 2005

The MedIX site is a collaborative site with the University of Chicago, and we focus on problems that will ultimately help radiologists diagnose patients with better accuracy and reliability. You can overwhelm yourself with pictures by taking a look at our site:

<http://facweb.cs.depaul.edu/research/vc/medix/index.htm>. The picture of me is a stock photo taken when I first joined DePaul – I keep it around to remind me that I was young once.

CISE REU PI Meeting, Pasadena, March 2011

18



## Scott Thede

Research Experiences in CS for Students  
At Undergraduate Institutions  
DePauw University  
Greencastle, IN 46135  
sthede@depauw.edu

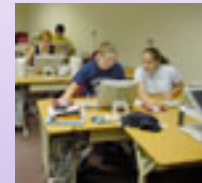
**Research areas of this site:** Human centered computing, including: persuasive technologies, development of a function programming IDE, natural language programming, virtual reality, wireless sensor networks, and cyber security

**Site active since:** 1993 (PI since 2009, Dave Berque previous PI)

Our site is focused on providing a research experience to students that may not have that opportunity. We provide the students with a strong cohort

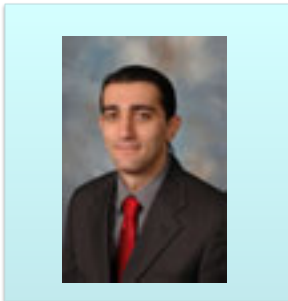


experience, with the students living and eating together. We visit a research university to allow students to get a taste of the graduate student life. Our students work in teams in close consultation with faculty mentors.



CISE REU PI Meeting, Pasadena, March 2011

19

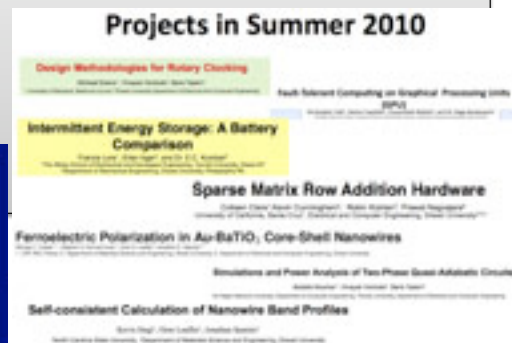


## Baris Taskin

Computing for Power and Energy  
Drexel University  
Philadelphia, PA  
taskin@coe.drexel.edu

**Research areas of this site:** VLSI Design, GPU/C++ computing, simulation for ultra-low power electronics, power networks, smart grids, green data centers, photovoltaics.

**Site active since:** 2010



20



# Dr. Niki Pissinou Numerical Computing & Optimization In Multidisciplinary Applications: Methods and Software

Florida International University  
pissinou@fiu.edu

**Research areas of this site:** Sensor Networks, Trusted Computing, Game Theory,  
**Site active since:** 2009

**Selected Research Projects:**

- Robustness of the Botnet Topology Formed by Worm Infection.
- Modeling packet forwarding as a stochastic game theory
- Wireless sensor network management security tool to detect Internal Attacks.
- Data Cleaning for Trajectory Sensor Objects.
- Design and development of electronic circuits to be used to control an unmanned, crawler robot system designed to carry a suite of sensors to detect living organisms buried after collapse of building due to earthquake or other natural disaster.
- Achieving Flow Level Constant Performance Guarantees for CICQ Switches without Speedup.

**Selected Peer Review Publications**

- Kamhoua, Pissinou, Busovaca, Makki, Belief-free Equilibrium of Packet Forwarding Game in Ad Hoc Networks under Imperfect Monitoring. IEEE ICC 2011, Kyoto, Japan.

21



Zach Dodds  
Harvey Mudd College  
REU in Systems  
Claremont, CA  
dodds@cs.hmc.edu



Harvey Mudd College  
REU in Systems



**Our research**

Intelligent Music Software

Intelligent Memory Management  
Vision-based Robotics

Algorithms for Biological Inference

**Our goal**

The **best bits** of grad school for 10 people and 10 weeks.



# Mike Jipping



Undergraduate Research in Systems and  
Bioinformatics  
Hope College  
Holland, Michigan  
jipping@hope.edu

**Research areas of this site:** Various, orbiting around systems and bioinformatics  
**Site active since:** 1992

Participants: 187, 142 from REU  
Graduate Schools: 36%  
51 presentations by 74 students  
21 papers published by 39 student authors  
12 external researchers joined us

<http://www.cs.hope.edu/reu>



CISE REU PI Meeting, Pasadena, March 2011

23



## Stephen Gilbert

SPIRE-EIT (Emerging Interface Tech.)  
Iowa State University  
Ames, IA  
gilbert@iastate.edu

**Research areas :** Human Computer Interaction  
**Site active since:** 2006

- Consumer Focus Groups Using Immersive Technology
- Cognitive Implications Of Semi-natural Virtual Locomotion
- Visualizing Gene Expression and Metabolomics Data
- Fuzzies: Educating High School Students About Genetics
- A Developmental Robotics Approach to Insertion Tasks
- The Effect of Interface Domain on Decision Making
- Psychophysiological Data Acquisition in Digital Games



CISE REU PI Meeting, Pasadena, March 2011

24



## Dr. Natarajan Meghanathan

REU Site: Undergraduate Research Program in  
Wireless Ad hoc Networks and Sensor Networks  
Jackson State University, Jackson, MS 39217  
natarajan.meghanathan@jsums.edu

**Research areas of this site:** Mobile Ad hoc Networks, Sensor Networks, Vehicular Ad hoc Networks. Research projects typically involve design of a new algorithm/protocol, extension/modification of an existing algorithm and implementation using simulations

**Site active since:** 2009

**Features of the Site:**

- 10-week high quality research program involving both theory and simulations
- 3-4 student groups, with each group comprising of students at different academic levels and background. Each group had a Principal Mentor and an Associate Mentor
- Each student worked on an individual project and each group had a common theme/focus. Students learn to do both individual as well as collaborative research.
- Two-thirds of the students are under-represented minority students
- Students learn to write quality research papers and present research work
- Graduate school and career orientation sessions; invited guest lectures; site visits

**Site Accomplishments:** 14 Peer-reviewed publications and 8 Abstract Presentations



## Kami Makki

Information Technology in Science and Engineering  
Lamar University  
Beaumont, Texas  
Kami.makki@lamar.edu

**Research areas of this site:** Distributed Systems, Networking, Databases, Software Engineering

**Site active since:** 2009, Number of Students: 12, Total Under-Represented Minority: 33 %

### Intelligent, Mobile Middleware Solution for Secure Automatic Reconfiguration

**Overview:**

Mobile computing has changed the way we interact with computing devices. However, mobile devices are still resource-scarce; while mobile devices as a whole remain constrained, individual device lines have varying levels of resources and capabilities that make every device line different from the other device lines. With these constraints in mind, this project attempts to offer a feature-rich, resource-efficient middleware. It is referred to as IMISSAR, offers automatic reconfiguration of applications and an intelligent knowledge-base which allows the device to switch applications from executing locally, to executing remotely.

**Operation:**

MISSAR monitors applications and their resource usage, plans reconfiguration, provides context, attempts to solve faults, and more. The four main portions of IMISSAR are depicted in figure below which shows the organization of these modules for this middleware.

**Design:**

The feature model is a key component of this

approach. The feature model allows us to decide all of the commonalities that would exist between different versions of the middleware on diverse devices. It also enables us to describe the different requirements needed for a wide range of mobile devices. It allows us to create a mobile middleware suited for multiple mobile devices. The feature model is a good roadmap of the middleware.

**Conclusion:**

We have proposed several key and novel features such as full application offloading, intelligent knowledgebase for reconfiguration faults, and a scalable remote server. IMISSAR provides for automatic reconfiguration of applications. It also offers a complete mobile middleware.





## Juana Moreno

Interdisciplinary Research Experience  
in Computational Sciences

Louisiana State University  
Baton Rouge, LA

[moreno@lsu.edu](mailto:moreno@lsu.edu); <http://reu.cct.lsu.edu>

Students learn about Cyberinfrastructure and Computational Sciences while collaborating in multidisciplinary projects.

**Research areas of this site:**

- *Core Computing Sciences*: areas at the heart of computational science.
- *Coast to Cosmos*: numerical relativity, coastal modeling, petroleum engineering.
- *Material World*: modeling and understanding of all materials.
- *Cultural Computing*: art, music, business, and mass communication.
- *System Science and Engineering*: advancing computer system concepts and design.

Site active since: Summer 2010

Michael Thomas, 2010 participant,  
Receiving the TeraGrid Conference  
2010 Best Student Poster Award



CISE REU PI Meeting, Pasadena, March 2011

27



## Dr. Dennis Brylow

Marquette University  
Computation Across  
The Disciplines

- New site at Marquette University in Milwaukee, WI.
  - Two previous internally-funded summers.
- 8 REU students x 10 weeks x 3 summers.
- Projects in Computational Sciences, Math Modeling and Statistics, Math Education and High-Throughput and Parallel Computing.
- Examples: Graph theory vs. hoof-and-mouth; modeling atmospheric, oceanographic and volcanic flows; energy-efficient cloud computing; predicting natural gas consumption; multicore embedded operating system design; examining relational thinking strategies.

28



# Howard Richards

Scientific Computing  
Marshall University  
Huntington, WV  
marshallreu@gmail.com

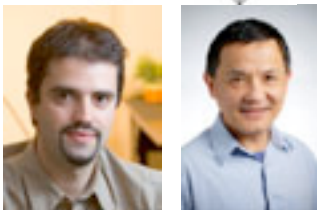
**Research areas of this site:** Computational Physics, Computational Chemistry, Computational Mathematics  
**Site active since:** 2010

James Howard, Julie Lang, and Mallory Price used Monte Carlo simulations to show that (1) a constraint that keeps droplets from splitting has a qualitative effect on metastable Ising lifetimes and (2) the critical droplet size for Ising models on nearest-neighbor lattices on the pseudosphere diverge at a nonzero magnetic field – the spinodal field.



CISE REU PI Meeting, Pasadena, March 2011

29



Stefan Robila, Jing Peng

*iImagine*

Montclair State  
University  
Montclair, NJ  
pengj@mail.montclair.edu

**Research areas of this site:** image processing, computer vision, machine learning  
**Site active since:** 2007

Provide an enriching experience by exposing the students to non-classroom faculty-student interactions, academic-industry and multidisciplinary research interaction and offering them the opportunity to gain hands-on experience with state-of-the-art imaging and vision technology. Visits to various industrial partners in the area are the highest rated activity. Often, these visits include recurring seminars that track the development of a large project such as IBM's Watson (a Deep QA machine)



2007



2008



2009



2010

30

CISE REU PI Meeting, Pasadena, March 2011



## Dr. Huirong Fu

UnCoRe: Undergraduate Computer Research  
Oakland University  
Rochester, MI  
fu@oakland.edu

**Research areas of this site:** Cyber security, information assurance, and intelligent information processing and management  
**Site active since:** 2002

### Sample Research Projects:

- Detection and Mitigation of Cooperative Attacks
- Trustworthy Transportation Ubiquitous Systems
- Intra-vehicle UWB Sensor Network
- Autonomous Network Security Management

URL: <http://cse-reu.secs.oakland.edu/>



CISE REU PI Meeting, Pasadena, March 2011



## Dr. Thomas Dietterich

Oregon State University  
tgd@cs.orst.edu

### Eco-Informatics Summer Institute

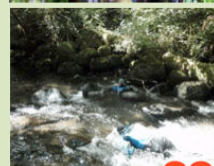
**Eco-Informatics Students:** Interdisciplinary teams of students from the fields of engineering, ecology, earth science, mathematics, and computer science

**Program goals:** To provide students with experience working in cross-disciplinary research teams and to facilitate the

**Location:** HJ Andrews Experimental Forest, deep in the Oregon Cascades!

#### Eco-Informatics Project Examples:

- Moths and meadows - modeling species distributions, interactions, and climate responses of over 400 species of moths
- Ecohydrology - Measuring and modeling diel fluctuations in stream flow and relationships with forest structure and type
- Wood in Streams - Measuring and visualizing velocity fields around engineered log jams and relating the hydraulic regions to fish behavior

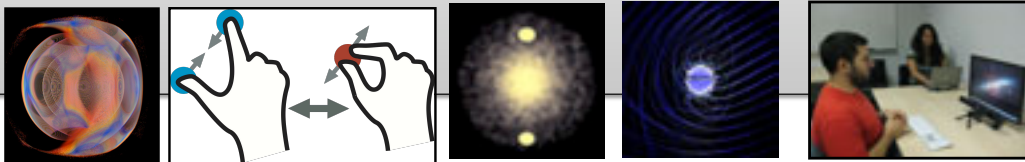




Hans-Peter Bischof  
 HPFS and Data Visualization  
 Rochester Inst. of Technology  
 Rochester/NY  
 hpb@cs.rit.edu

**Research areas of this site:** Visualization of Scientific Data/Perception/Gesture Recog.  
**Site active since:** 2010

24 students/3 paper & 1 poster @ international conferences/8 poster @ug research conf.  
 5 faculty/2 panels/2 research lab/many movies/lake Ontario/barbeque/cookies ☺



CISE REU PI Meeting, Pasadena, March 2011



Eugene Fiorini  
 DIMACS/CCICADA/DIMATIA REU  
 Rutgers University  
 New Brunswick, New Jersey  
 reu@dimacs.rutgers.edu

**Research areas of this site:** Research areas include graph theory, computational geometry, logic and complexity theory, combinatorial optimization, DNA topology, biomedical engineering, epidemiological modeling, economic applications involving e-commerce, information management in massive data sets.

**Site active since:** 1992

**International Component:** Five undergraduate students and the graduate coordinator are sent to DIMATIA, our sister institution in Prague, for 2.5 weeks at the end of the program. DIMATIA sends 7 undergraduates and a graduate student from Charles University to spend 6 weeks at the beginning of the program. Students participate in problem sessions and attend a conference presenting results.



CISE REU PI Meeting, Pasadena, March 2011



## Matthew Stone

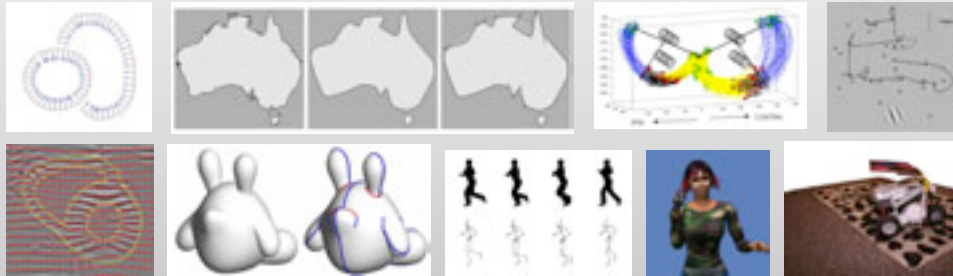
Perceptual Science and Technology

Rutgers University

Piscataway, New Jersey

Matthew.Stone@Rutgers.edu

**Research areas of this site:** Artificial Intelligence: Vision, Graphics, Learning, Interaction  
**Site active since:** 2011



CISE REU PI Meeting, Pasadena, March 2011

35



## Dan Stefanescu

Massive Online Social Networks

Suffolk University

Boston, MA

dan@mcs.suffolk.edu

**Research areas of this site:** Networks properties, privacy issues, knowledge acquisition  
**Site active since:** 2010

- 3 projects, 8 students (2 women, 1 hispanic, 5 with no previous research experience)
- 1 week tutorials, 1 week student presentations, 6 weeks of student activities: design of experimental tests, collection of data via network crawlers of own design and implementation, data analysis, participation in weekly group meetings
- Daily Web blogging, daily coffee breaks, WOSN'10 participation, MathWorks visit
- Research results: new topological properties of MOSNs, "communication" network is instrumental for design of privacy mechanisms, Last.fm generated "friend" compatibilities - not seem beneficial to preferential knowledge acquisition
- post survey: significant increase in research skills, interest in pursuing graduate studies.

CISE REU PI Meeting, Pasadena, March 2011

36

## REU Site: Applied Computing Research in Wireless Sensing of Marine Data



Dulal Kar, Ahmed Mahdy, and Longzhuang Li  
Texas A&M University-Corpus Christi

- Research Projects
  - Design of Marine Wireless Sensor Networks
  - Energy Efficiency of Elliptic Curve Cryptography for Wireless Sensor Networks
  - Integration of Marine Sensor Data
  - Monitoring and Data Gathering of Wireless Sensor Networks Using Handheld Devices
- Participants
  - Eight (Gender: 3 females, 5 males; Ethnicity: 1 Black, 1 Hispanic, 1 Asian, 5 Whites)
- Activities
  - Tour to Harte Research Institute and Conrad Blucher Institute
  - Seminars on TAMUCC's research activities, marine wireless sensor networks, marine sensor data integration, wireless sensor network security, library research, research methods, technical writing, presentation skills, professional ethics, graduate school application, social events
  - Symposium presentations at TAMUCC
- Outcomes
  - Two participants applying for grad school; two papers submitted/accepted for publication



37



PI: Susan D. Urban Co-PI: Michael Shin  
Co-PI: Mohan Sridharan  
Research Experiences for Undergraduates in  
Software Engineering and Service Composition  
Texas Tech University, Lubbock, TX  
[susan.urban@ttu.edu](mailto:susan.urban@ttu.edu)  
Site active since: 2010

Research areas: Software specification for self-managed embedded systems, robots, and agents; Dynamic recovery in service-oriented systems.  
-2 women, 2 Hispanic, 3 African-American  
-4 students continued REU Supplements  
-5 students presenting at NCUR 2011  
-1 student selected for Texas Undergraduate Research Day at the Capitol  
-Publications in progress with participants and their graduate mentors



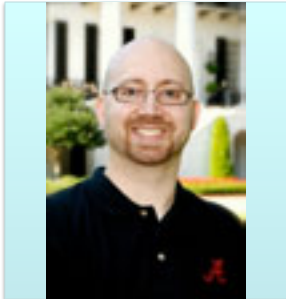


## Byron J. Gao

Research Experiences in New Paradigms  
of Information Retrieval from Diverse Data  
Texas State University  
San Marcos, Texas  
bgao@txstate.edu

**Research areas of this site:** Information retrieval, Data mining  
**Site active since:** 2011

The world is becoming increasingly digitalized. Digital data appear in diverse forms: textual, multimedia, geo-referenced, structured, etc. Retrieving information from such diverse data of large scale pose unprecedented challenges. Our research projects will explore new paradigms and architectures for information retrieval and Web search, multimedia information retrieval, spatial and temporal information retrieval, and discovery of scientific data sources.



## Nicholas A. Kraft

REU in Software Language Engineering  
The University of Alabama  
Tuscaloosa, AL  
nkraft@cs.ua.edu

**Research areas of this site:** Software maintenance and evolution, program comprehension, domain-specific languages, mining software repositories, empirical software engineering, software engineering for robotics

**Site active since:** Fall 2009

**Highlights:**

- Two GAANN Doctoral Fellowship awardees, one NSA Director's Summer Program participant
- Paper accepted by the 2010 IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems
- Posters won 2<sup>nd</sup> and 3<sup>rd</sup> places in the Student Comp. at the 48<sup>th</sup> ACM Southeast Conf.
- Talks by F. Allen (2006 Turing Award winner), M.L. Soffa (Univ. of Virginia), V. Basili (Univ. of Maryland)





## Sheila Humphreys

Superb-IT for Sustainability

**David Culler, Principal Investigator**

UC Berkeley, Berkeley, CA

humphrys@eecs.berkeley.edu

**Summer Undergraduate Program in Engineering Research at Berkeley:**

**SUPERB: Information Technology for Sustainability**

Smart Phones for monitoring energy efficiency  
Solar thermal generation  
Real-time impact of traffic on health  
Building efficiency: data mining for optimization

**Berkeley's SUPERB-ITS is a new site in 2011, but EECS has enjoyed REU funding since 1991, with differing research themes and Principal Investigators. Over half of the EECS faculty have mentored SUPERB students. SUPERB focuses on diverse students and training in research as a means to prepare for competitive graduate school applications.**

CISE REU PI Meeting, Pasadena, March 2011

41



\* Attending 2011 PI Meeting

## William Kaiser, PI

### Wes Uehara, Program Manager\*

Sense & Sustainability

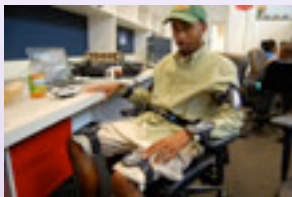
UCLA - Los Angeles, California

[wuehara@cens.ucla.edu](mailto:wuehara@cens.ucla.edu)

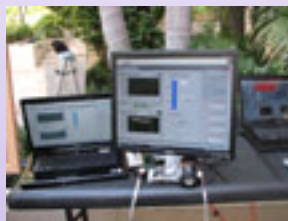
[kaiser@ee.ucla.edu](mailto:kaiser@ee.ucla.edu)

**Research areas of this site:** Wireless Monitoring & Instructional Technologies

**Site active since:** 2009



Monitoring of environments for sustainability and individuals for health and wellness promotion are both critical international technology needs. Highlights of the Sense&Sustainability program include both large scale residential energy monitoring network system development and wireless health systems. Student researchers have engaged at every level of algorithm and system development of hands-on hardware and software.



Education research has demonstrated that introduction of hands-on physical systems significantly improves student learning of fundamental concepts. A highlight of recent student research in this REU site was the development of a novel, low cost, robotic platform creating an Inverted Pendulum design challenge. This has been deployed to over 100 students in a University of California, Los Angeles Control Systems course with success in instructional systems, individual student success and motivation.

CISE REU PI Meeting, Pasadena, March 2011

42



Teresa.Dahlberg@uncc.edu

**Socially Relevant Research Experiences:**  
Visualization, Virtual Environments, Gaming and Networking

UNC Charlotte

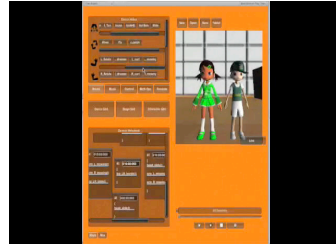
Site active since 2006



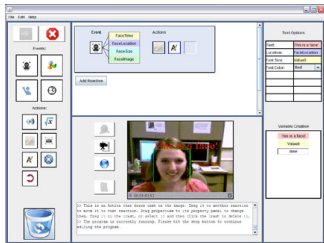
Audrey.Rorrer@uncc.edu

**Evaluation** - led the implementation of the CISE REU Site Common Application and the A La Carte Survey.

**Gaming** research focused on developing BOTS, a game-based education tool designed to retain at-risk students in computer science.



**Visualization** research used a storm surge model to innovatively demonstrate the relationship of time varying data within a 3D framework.



**Virtual Environments** used video-based environments to teach computational thinking concepts.

43



Richard Hughey



SURF-IT

Jack Baskin School of Engineering  
University of California Santa Cruz

rph@ucsc.edu

**Integrative System Design:** Networks, Robotics, Architecture/VLSI, Assistive Technology  
**Site active since 2003:** 100 researchers, 45% women, 23% URM, 64% graduate school

2010 New cross-campus summer poster symposium.  
2011 will add 2 more programs!

Jordan Maier, Seattle University  
Where's Your Bus?  
SlugTransit Bus Tracking System

Lourdes Morales, UPR  
Motivating Adolescents to be Active w/ Mobile Game



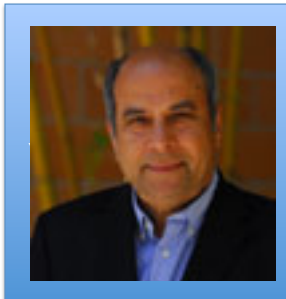
## Vamsi Krishna Paruchuri

HIT@UCA: Applied Research in Health IT  
University of Central Arkansas  
Conway, AR  
vparuchuri@uca.edu

**Research areas of this site:** Health Information Technology topics ranging from medical image processing, to health informatics and to electronic health records transmission while preserving security and privacy

**Site active since:** 2011

This project will have its positive impacts on graduate students at UCA and on K-12 students across the region through intertwining with the existing graduate program and K-12 outreach with the REU project results.

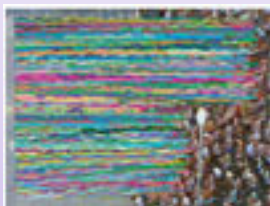


Mubarak Shah &  
Niels da Vitoria Lobo  
**REU in Computer Vision**  
**University of Central Florida**  
**Orlando, FL**  
[shah@eecs.ucf.edu](mailto:shah@eecs.ucf.edu)

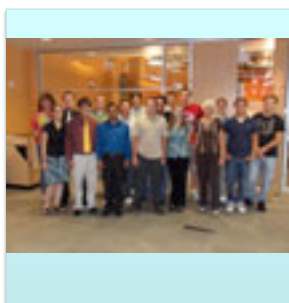


**Research areas of this site:** **Computer Vision**

- Site active since: 1987
- Opportunity to work with **Ph.D. students & post docs in addition to faculty mentors**
- Emphasis on publication



Tracking in Dense Crowds,  
Nolan Warner- University of Nevada, Reno



## Jugal Kalita

REU Site for AI, NLP and IR  
 University of Colorado  
 Colorado Springs, Colorado  
 jkalita@uccs.edu

**Research areas of this site:** NLP, IR, Machine Learning

**Site active since:** 2009

**Recent Projects:**

Investigation into multi-class SVM classification	Creating a large-scale face database
Finding trending topic in a microblog stream	Multi-post Twitter summaries
Syntactic standardization of Twitter posts	Developing lexical resources for multiple languages
Extracting events and temporal relations from Wikipedia	Recognition of named locational entities in Wikipedia
Optimal soft keyboard schemes for text input	Scaling ontology alignment
Integrating Framenet and Wordnet	Integrating Verbnet and Wiktionary

Four paper students traveled to conferences in 2010.

CISE REU PI Meeting, Pasadena, March 2011

47



## John A. Chandy

Trustable Computing Systems Security  
 University of Connecticut  
 Storrs, CT  
 john.chandy@uconn.edu

**Research areas of this site:** Hardware security, trustable computing

**Site active since:** Just getting started

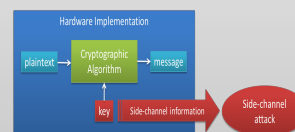
Nine students, seven faculty, ECE and CSE departments  
 Features a trip to Hardware Oriented-Security and Trust Symposium  
 Field trips to local industry  
 Weekly research seminars  
 Workshops on graduate school and career development coordinated with other School of Engineering REUs

<http://ciaccs.engr.uconn.edu/reu>

CISE REU PI Meeting, Pasadena, March 2011

### Side-channel Attacks

How do you prevent secret information from leaking through observation of power consumption, electromagnetic emanation and other methods?



48



**Stephen Huang**  
 REU in Computational Science  
 University of Houston  
 Houston, TX  
 shuang@cs.uh.edu



**Research areas of this site:** Computational Science with particular emphasis on bio-medical applications.  
**Site active since:** 2005

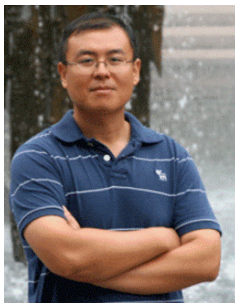
**Selected Topics:**

- Data Analysis for Disease Prediction
- 3D Facial Recognition using Kinect
- Visualization of Cytometry Data
- Image Analysis for Cardiovascular Screening
- Fast Clustering on Large Data Sets

**Statistics:**

- Total Participants in 6 Years: 71
- Local Student: 16%
- Female: 30%
- Asian American: 15%
- African American: 10%
- Hispanic 16%

49



**Ping Chen**  
 Research Experiences in Algorithm Design and Analysis for Students in Undergraduate Institutions  
 University of Houston-Downtown  
 Houston, Texas  
 chenp@uhd.edu

**Research areas of this site:** Describe the research areas/themes of your site  
**Site active since:** 2009

Sample Project: **Natural Language Processing and Knowledge Acquisition**  
 Knowledge is critical in building intelligent systems. However, many real-world applications require a large amount of high-quality knowledge, which results in a serious knowledge acquisition bottleneck. The goal of this project is to acquire and evaluate a large amount of lexical-dependency knowledge. Lexical-dependency knowledge can be used in many lexicon-level Natural Language Processing applications. The challenges of this project lie in collecting sufficient high-quality knowledge and efficient application of such knowledge to various NLP fields. Participants of this project will work on a complete cycle of research, including problem analysis, design, implementation, and paper publishing. So far this project has produced 4 publications based on REU students' work, the most recent paper will appear in IEEE Intelligent System.

50



**Masooda Bashir, PhD**

[mnb@illinois.edu](mailto:mnb@illinois.edu)

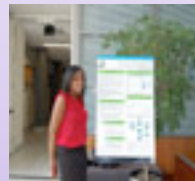
**Summer Undergraduate Research Internship  
Program at the Information Trust Institute:  
University of Illinois at Urbana-Champaign**  
<http://www.iti.illinois.edu/2011interns>



**Research areas of this site: Multidisciplinary Research on Security, Reliability,  
and Safety in Networked Information Systems**  
**Site active since: Summer 2009**

Key Features

- Domestic REU students supported by NSF, and international students supported by other funds
- Students attend six 90-minute sessions on responsible conduct of research and on ethics in the development and use of information technology
- Graduate student mentors of REU students attend sessions to develop mentoring skills



CISE REU PI Meeting, Pasadena, March 2011



**Susan M. Larson**

**Passionate on Parallel**  
**University of Illinois at Urbana-Champaign**  
**Urbana, Illinois**  
[smlarson@illinois.edu](mailto:smlarson@illinois.edu)

**Research areas of this site:**

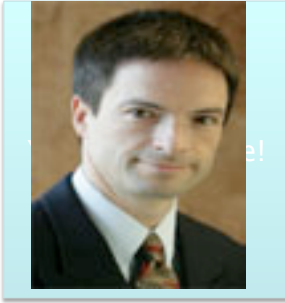
Parallel computing applied in engineering and science

**Site active since: 2010**

**2010 Projects; 2 student teams:**

- What's the impact on the climate system from human activities?
- What factors impact the start-up and success of small businesses?
- How do galaxies form and evolve?
- What's the logical next step in network communications?
- Can someone control a machine using only their thoughts?

CISE REU PI Meeting, Pasadena, March 2011



## Michel Cukier

Undergraduates Engaged in  
Cybersecurity Research

University of Maryland, College Park, MD  
mcukier@umd.edu

Research areas of this site: Cybersecurity, wireless and network security, cryptography, secure software, cyber supply chain security, cybersecurity policy, multimedia forensics, the economics of cybersecurity.

Site active since: 2007

The site focuses on the area of cybersecurity at the new Maryland Cyber Security Center at the University of Maryland. The site offers enhanced research experiences to teams of undergraduate students. Particular emphasis is placed on recruitment of students from under-represented populations and from community colleges. The research experience results in the students' better understanding of the computer science discipline, enhanced self-confidence and an increased interest in pursuing graduate school or future research opportunities.

CISE REU PI Meeting, Pasadena, March 2011

53



## Pamela Abshire

Biosystems Internships for Engineers (BIEN)  
University of Maryland, College Park  
College Park, MD

pabshire@umd.edu

**Research areas of this site:** *biosystems applications of electrical & computer engineering* covering cross-disciplinary topics including microsystems, devices, bioengineering, optics, signal processing, controls, and neuroscience  
**Site active since:** 2008



**Site focuses on mentoring, community building, ethical problem solving.**

**Example project:** Control and Coordination of Micro-Robots, Chris Perkins and Lydia Lei

**Goal:** Reliable and accurate distance sensing for miniature robots

**Results:** Compared methods based on received RF power (RSSI) and time-difference-of-arrival (TDOA) and found that, while RSSI required less hardware, TDOA was more accurate. (will demo at ISCAS 2011)



CISE REU PI Meeting, Pasadena, March 2011

54



# Rick Adrion

REUMass

Univ. of Massachusetts

Amherst, MA 01003

[adrion@cs.umass.edu](mailto:adrion@cs.umass.edu)

<http://reu.cs.umass.edu>

**Research areas of this site:** *Fundamental computing research* projects motivated by a broad set of *challenges* within a number of disciplines – society, health and medicine, education, government, biosciences, transportation, environment, etc.

**Site active since:** 2008

**Goals:**

- leading-edge interdisciplinary research
- supporting communities & mentors
- create excitement about computing, research & graduate study
- establish measurable outcomes



**Outcomes:**

- 39 Site students from 34 universities and colleges; a total of 61 participating REU students
- 49% were women and/or URM; 18% had a community college background
- Most plan to apply to graduate programs and many of those who graduated have enrolled



# Jon Youn

Site for Extensive and Collaborative Undergraduate Research Experience (SECURE)

University of Nebraska at Omaha

Omaha, Nebraska

[jyoun@unomaha.edu](mailto:jyoun@unomaha.edu)

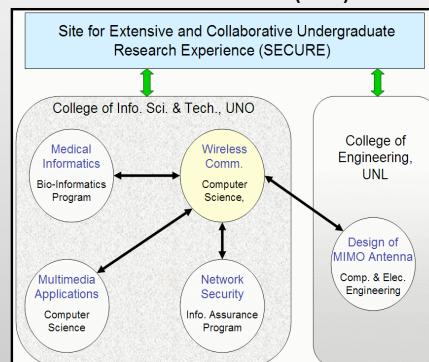
**Research areas of this site:** Info. technology (IT) & Wireless Communication (WC)

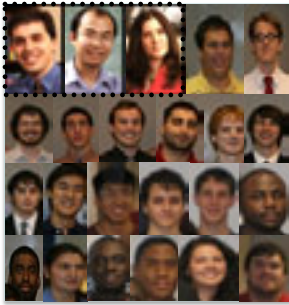
**Site active since:** 2011 Summer (New)

**Research Objective:** To develop a real-time patient monitoring and smart home application.

**Participating Units**

- College of Info. Science and Tech. (UN-Omaha)  
Dept. of Computer Science, Bio-informatics Program, & Information Assurance Program
- College of Engineering (UN-Lincoln)  
Dept. of Computer and Electronics Engineering



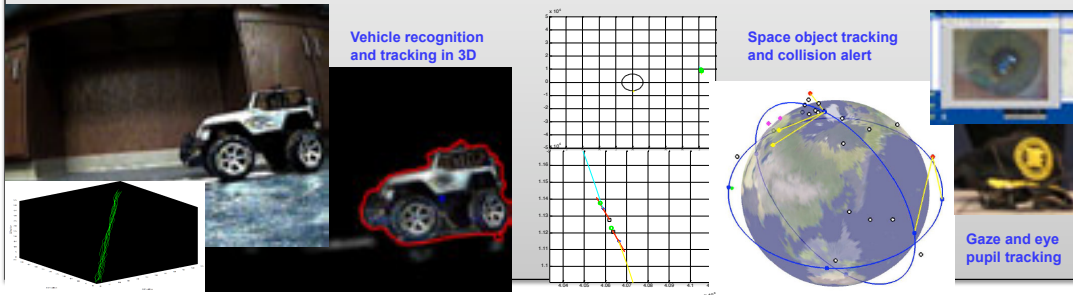


Dimitrios Charalampidis (PI)  
 Huimin Chen (Co-PI) Edit Bourgeois (Senior Personnel)

**TRACK: Training and Research in  
 Advanced Computing Knowledge**  
 University of New Orleans  
 New Orleans, LA 70148

**Research areas:** Image processing, object detection and tracking, sensor management, machine learning

**Site active since 2009** <http://ece.engr.uno.edu/REU/>



CISE REU PI Meeting, Pasadena, March 2011



**Jarek Nabrzyski**  
 Multidisciplinary Computational Science  
 University of Notre Dame  
 Notre Dame, IN  
 naber@nd.edu

**Research areas of this site:** Multi-scale Computations in Engineering and Science, Multidisciplinary Molecular Modeling and Simulation, Validation and Verification, Cyberinfrastructure Development.

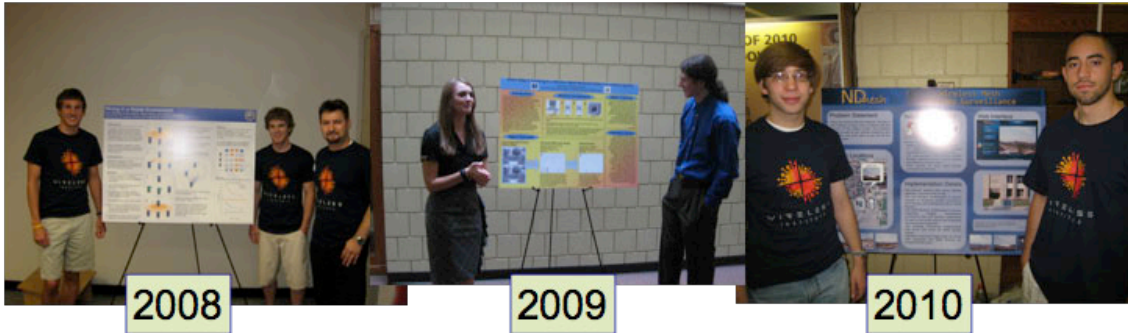
**Site active since:** 2011

CISE REU PI Meeting, Pasadena, March 2011

# ERWiN: Experimental Research in Wireless Networking

University of Notre Dame

C. Poellabauer, A. Striegel



## Highlights

Renewed for 2011-2013  
 Cadre of 12-15 students (Site+Supp)  
 Focus in 2011 on Android, Social N/W

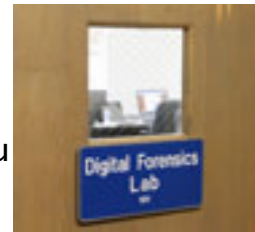


<http://www.cse.nd.edu/~darts/reu.html>

## Vic Fay-Wolfe and Kristen McCooley



Digital Forensics REU  
 University of Rhode Island  
 Kingston, RI  
 {wolfe,kmccooley}@cs.uri.edu  
<http://reu.cs.uri.edu>  
 Site active since: 2010



*Digital Forensics is the application of forensic science techniques to the acquisition and analysis of evidence that exists in digital form (e.g. evidence found in files on hard drives, in emails, in network activity, etc)*

### 2010 REU Projects

- Human image detection for law enforcement
  - Computer vision
  - Machine learning
- Steganography detection
  - Machine learning
  - Video codecs and frame identification
- Law enforcement search string assistant
  - Regular expressions
  - Applied DFA minimization
- Disseminating digital forensics research
  - Inter-disciplinary with business
  - Transition of research to commercial

### 2010 REU Info

- 8 students
- 10 weeks
- 2 Seminars/week
  - CS Research
  - CS Research Writing
  - CS Research
- Presenting
  - Ethics
  - Grad School
  - Technical
  - Student proposals
  - Student final presentations
- Social activities





## Caroline M. Eastman

Multidisciplinary Research in Secure Computing  
University of South Carolina  
Columbia, South Carolina  
eastman@cec.sc.edu

**Research areas of this site:** Information assurance, network security, security education  
**Site active since:** 2004

We started out with a multidisciplinary theme, with the intention of involvement from other departments. With the current grant, we have a more focused theme – computer security. We have had 9-12 students each year, with some receiving joint support from the South Carolina Alliance for Minority Participation or AccessComputing. We strongly encourage students to submit papers to conferences by budgeting for an additional stipend if they submit a paper.

Note: I was dressed as Computer Engineer Barbie for a college reception.

CISE REU PI Meeting, Pasadena, March 2011

61



## Miguel A. Labrador

**REU Site on Ubiquitous Sensing**  
University of South Florida  
Tampa, FL  
mlabrador@usf.edu

**Research areas of this site:** Location-based services, participatory sensing, and human-centric sensing applications and technologies and algorithms that support them such as security and privacy, incentive mechanisms for participation, automatic human activity recognition, data validation and visualization

**Site active since:** First year of this site but seventh consecutive year

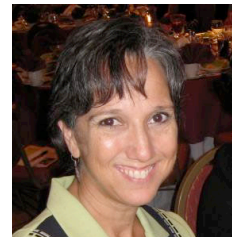


CISE REU PI Meeting, Pasadena, March 2011

62



Sriram Vishwanath  
 sriram@ece.utexas.edu



Julie Levy  
 jlevy@austin.utexas.edu

**EURECA** The University of Texas at Austin

**Research areas of this site:**

Networked Robotics: Design and Deployment  
 Communications, Signal Processing and Networking Theory  
 Security and Design of Secure Systems

**Site active since:** 2006



CISE REU PI Meeting, Pasadena, March 2011



W. Eric Wong

**Verification and Validation for Software Safety**

University of Texas at Dallas  
 Richardson, Texas

[ewong@utdallas.edu](mailto:ewong@utdallas.edu); <http://paris.utdallas.edu/reu>

**Research areas of this site:** Software Engineering – Software Safety

**Site active since:** 2009

- A close collaboration with industry partners
- Special field trips to Raytheon, Lockheed Martin Aeronautics, and EDS/HP to help REU students better understand how software safety is verified and validated in practice for real-life applications
- In collaboration with an NSF/IUCRC project – Foundational Requirements for Competency in Software Safety



CISE REU PI Meeting, Pasadena, March 2011



## UTEP REU Summer Site in Applied Intelligent Systems

P.I.: Olac Fuentes  
[ofuentes@utep.edu](mailto:ofuentes@utep.edu)



### Research areas of this site:

Intelligent systems with applications in psychology, astronomy, geology, industrial engineering, biology, human-computer interaction, and software engineering

Site active since: 2009



CISE REU PI Meeting, Pasadena, March 2011



## Byeong Kil Lee

**ESCAPE:** Experimental Study on Computer Architecture and Performance Evaluation

University of Texas at San Antonio (UTSA)  
San Antonio, Texas

[Byeong.Lee@utsa.edu](mailto:Byeong.Lee@utsa.edu)

Research areas of this site: Computer Architecture and Performance Evaluation

Site active since: 2011

Research topics: power estimation, workload reduction for early design exploration, low power design, power optimization, GPGPU, mobile computing, and traditional architectural topics (cache, branch prediction, etc.)

Attractions in San Antonio: River walk, Alamo, Sea World, 1.5 hrs from Austin/Houston

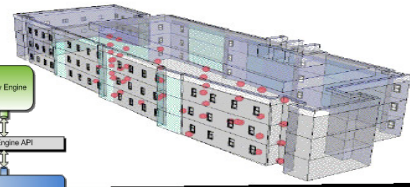
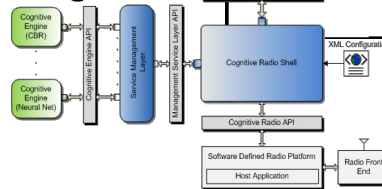
For more details: <http://www.ece.utsa.edu/~escape>





**Tamal Bose**

Cognitive Communications@VT  
Virginia Tech  
Blacksburg, VA  
tbose@vt.edu



**VT-CORNET**

**Research areas of this site:** Cognitive radios, software defined radios, wireless communications, and digital signal processing

**Site active since:** Summer 2009

**Features Highlights**

- Hands-on experience on the Cognitive Radio Network Testbed (VT-CORNET)
- Annual Symposium and Wireless Summer School @ VT attendance
- Internal and External assessment and evaluation

**Research Project Examples:**

- Dynamic Spectrum Access
- Cognitive Engine for Adaptive Modulation
- Interface Design for PSCR (Public Safety Cognitive Radios)
- Spectrum sensing for cognitive radios
- Signal processing blocks for OSSIE (SCA)

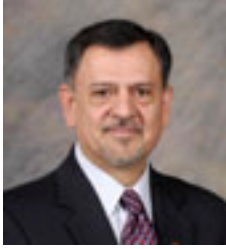
CISE REU PI Meeting, Pasadena, March 2011

67

## Research Experience for Undergraduates in

<p><b>Participant Benefits</b></p> <ul style="list-style-type: none"> <li>• Summer stipend</li> <li>• Housing and meal plan</li> <li>• Enriching summer activities</li> <li>• Conference travel support</li> </ul>	<p><b>Learn the Art of Research</b></p> <ul style="list-style-type: none"> <li>• Work in an active and vibrant program with unique facilities</li> <li>• Interact with faculty members, graduate students, and other undergrads</li> </ul>	<p><b>Apply for Graduate School</b></p> <ul style="list-style-type: none"> <li>• Gain valuable research experience that will help you in applying to grad school</li> <li>• Learn more about the projects you could do as a graduate student</li> </ul>	  
		<p><b>Center for HCI</b></p> <ul style="list-style-type: none"> <li>• 12 core faculty members from multiple disciplines</li> <li>• Leading development of new theories and technology</li> </ul>	
<p><b>Publicize the Results of Your Research within the Community</b></p> <ul style="list-style-type: none"> <li>• Create a poster and present your work at a Research Symposium</li> <li>• Write a professional research paper and submit it to a conference</li> <li>• Present your work to the broader community at the conference</li> <li>• Get feedback from the academic and industrial communities</li> </ul>		<p><b>Virginia Tech</b></p> <ul style="list-style-type: none"> <li>• Large university that strongly supports the Center for HCI</li> <li>• Diverse research areas complement HCI strength</li> </ul>	<p><b>Partner Schools</b></p> <ul style="list-style-type: none"> <li>• Local partners include NCA&amp;T, Bennett College, Hollins, Norfolk State</li> <li>• Other participants from Wellesley, UPRM, CMU, Oberlin, and elsewhere</li> </ul>
<p><b>Application Processing Begins Feb 15, until all spots filled</b></p> <ul style="list-style-type: none"> <li>• Complete an online application to apply for a position</li> <li>• Learn more about the research at Virginia Tech</li> <li>• Check the online schedule and read about upcoming events</li> </ul>			
<p style="text-align: center;"><b>Contact us for more information</b></p>			

68



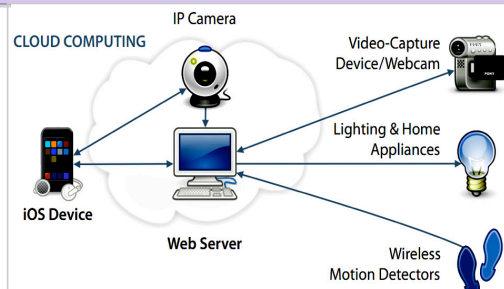
## Behrooz Shirazi

Research Experiences for UGs in Smart Environments  
 Washington State University  
 Pullman, WA  
 shirazi@wsu.edu

**Research areas of this site:** AI, Learning, Pervasive Computing, Psychology (Cognitive Disabilities)

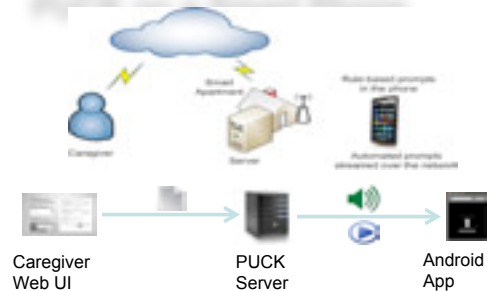
**Site active since:** Summer 2010

**Cool Feature:** Some of the REU participants live and work in “Smart Apartments” on WSU campus



CISE REU PI Meeting, Pasadena, March 2011

### PUCK on a Smart Phone



## C-Z Xu and Syed Mahmud

Research Experience for Undergraduates in  
 Telematics and Cyber Physical Systems  
 Wayne State University, Detroit, Michigan

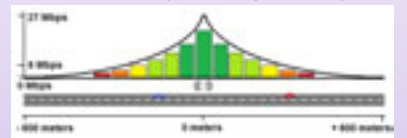
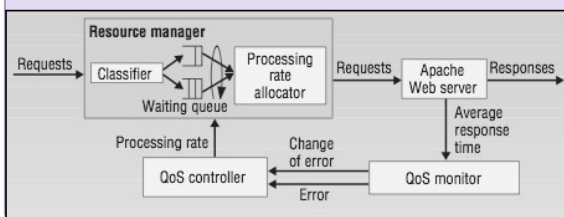
[czxu@wayne.edu](mailto:czxu@wayne.edu), [smahmud@eng.wayne.edu](mailto:smahmud@eng.wayne.edu)

**Research areas of this site:** Vehicular Networks, Internet Technology and Web Applications, Intelligent Transportation System and Robotic Surgery.

**Site active since:** 2009

### A Partial List of Projects:

- 1) eQoS in a Virtualized Environment, 2) Optimizing Roadside Unit to Vehicle Downloads, 3) Data-Driven Optimization of Surgeon Skills, and 4) Optimization of Data Uploading Task By RSU in V-2-RSU Communication



1/10 sec	1/10 sec	1/10 sec	1/10 sec	1/10 sec	1/10 sec
A	A	A	A	A	A

CISE REU PI Meeting, Pasadena, March 2011