Welcome CAP Executive Board



June 5, 2008



CAP 2008 - 2009 Leadership

CAP Chairman: *Rich Goldberg VP, Corporate Quality, Cisco*



CAP Vice Chairman: Danny Brown VP, Technology Development, Cymer



Mahalo Nui Loa

CSE Dept Chairman Prof. Keith Marzullo

& The 2008 Ukulele Class for sharing their musical talents!



Welcome Distinguished Students

Jacobs School Scholars and Fellows

TIES Ambassador Corps

Tau Beta Pi

Society of Automotive Engineers





President 2007-08 Madeline Chiu, Bioengineering Senior

President 2008-09

Brandon Reynante, Mechanical Engineering Senior



2007 - 2008

- Awarded RC Matthews Most Outstanding Chapter Award
- 62 New Members
- 90+ Events and Increased Variety







2007 - 2008

- Increased Member Benefits
- Offered Three \$500
 Scholarships
- And most importantly...
 - E-Games Champions!







Integrity and Excellence in Engineering

Goals for 2008 - 2009

- Increase member involvement and benefits
- Improve student-faculty relations
- Secure more funding for TBP related activities
 - Project fund for members
 - Industry partnerships (SPAWAR, ViaSat)
- Heighten awareness of TBP
 - Campus and community wide
- More support for Programs
 - Mentor-mentee program
 - Strengthen tutoring program









Competition

June 25th – 28th, 2008 California Speedway Fontana, CA 82 Universities from 9 countries

Static Components

- Cost Report
- Design Presentation
- Business Plan Presentation
- Technical Inspection

Dynamic Components

- Autocross
- Endurance
- Skid Pad
- Acceleration



SAE Activities: Past & Present Sponsored 8 academic projects:

- MAE 171B
- MAE 199
- MAE 296
- MAE 299
- CSE 299

Currently sponsoring two MAE 171B projects

- Suspension dynamometer
- Finite element analysis of brake rotors.

Fielded an all women's FSAE team in 2007

UCSD FSAE Progress









Y2K: Hp: ~40 Weight: 650lb Rocker weight: 300g TR6: Hp: 85 Weight: 500lb Rocker weight: 127g

Design Process



Design-space CAD model (material that can be there)

Optimization analysis model with appropriate boundary conditions

Optimization results with interpreted CAD model overlayed Analysis of optimized geometry to verify results

Finalized geometry ready for manufacture







Fontana Practice Event May 2008



Future Plans

- Hybrid power train; Diesel-Electric for Formula Hybrid 2009
 Huge interest from local companies
- Drives UCSD's goal to become the Greenest University in the US
- Relevant to current trends in industry





Welcome New CAP Members!











Staccato Communications

Steven Larky, VP Engineering

Company Overview

Mission

World's leading supplier of UWB silicon & software solutions

Organization

- Staccato founded in 2002 with headquarters in San Diego, CA
- 80 Full-Time Employees (80% in R&D)
 - Deep experience in wireless architecture, silicon & software

Product Status

- Ripcord1 (110nm) WiMedia & WUSB certified
- Ripcord2 (65nm) Production samples in June'08

Financial

- Completed three rounds of capital funding
- Allegis, Bay Partners, Charles River, Formative, Intel Capital, commenter Interwest, KTB Ventures, Vision Capital

Industry Leadership

- First certified single-chip CMOS solution
- Software protocol development leadership
 - WUSB, BT3.0 (next gen Bluetooth), Wireless Audio/Video

Intellectual Property

61 total filed patents to date







Ripcord2 65nm CMOS







- World's first & only 65nm single-chip CMOS UWB solution
- Only viable solution for cellular handsets and consumer products
 - Cost Enables sub-\$5 selling price 50% lower BOM than competition
 - Power 10 times more efficient than WiFi
 - Size 5 mm x 5 mm (nearest competitor is 3 times the size)
 - Worldwide regulatory footprint BG1, BG3, and BG6
 - High performance simultaneous multi-protocol operation



Key Milestones

MILESTONE	DATE
Production Tapeout	Done
Production Samples	June'08
Production Ramp	Q1'09



Why did Staccato join UCSD CAP?



- True Win-win Partnership
 - Recruiting
 - Interns we've hired several already!
 - Team Internship Program
 - Full Time Hires
 - Undergraduate Education our future
- University interaction
 - 75 of Staccato's 79 employees are in San Diego
 - UCSD is a top echelon university
 - UWB is a complex technology RF, SW, protocols
 - Networking opportunities





Faculty Presentation

Kenneth S. Vecchio, Ph.D. Professor and Chairman, Department of Nanoengineering





Jacobs School of Engineering Dean Frieder Seible





Jacobs School Ranked #10 in the World for Engineering, Technology and Computer Science

2008 World Rank In ENG	2007 Rank	INSTITUTION		
1	5	Massachusetts Institute of Technology (MIT)		
2	2	Stanford University		
3	26	University of Illinois - Urbana Champaign		
4	3	University California - Berkeley		
5	21	University of Michigan - Ann Arbor	_	
6	38	University of Texas – Austin		Academic Ranking of
7	60	Carnegie Mellon University		World Universities
8	102-150	Georgia Institute of Technology		
9	43	Pennsylvania State University - University Park		Institute of Higher
10	14	University of California - San Diego		Education,
11	50	University of Southern California		Shanghai Jiao Tong Univ.
12	6	California Institute of Technology		
13	35	University of California - Santa Barbara		February, 2008
13	37	University of Maryland - College Park		
15	4	Cambridge University (UK)		

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1st UCSD research center to be named for corporate partner

### Founding Industry Members:





Corporate-specified research Cadre of students trained with unique industry perspective

### **Focus Areas:**

Positioning Systems (manufacturing) Sensor Networks Unmanned Systems Energy and Propulsion Systems Structures and Noise Biological Systems Finance





# **Department of NanoEngineering**

Established July 1, 2007, Celebrated Jan 25, 2008

### **Faculty Recruitment**

3 open positions; 450 applications received



### **Professor Joseph Wang**

**ISI 'Citation Laureate' Award:** Most Cited Engineer in the World (1991-2001)

- Focus: Nanobioelectronics Sensors Functional Nanomaterials
- Applications: Lab on Chip Sensors to detect pollutants, explosives and biomolecules DNA analysis

### invitrogen<sup>™</sup> <sup></sup> *CSD* | School of Jacobs | Engineering

### 2008 Invitrogen-UCSD Frontiers in Biotechnology Distinguished Seminar Series

Inaugural Keynote: Robert Langer, MIT





### Engineering in Medicine Organized Research Unit Established May 2008



David Cheresh, Co-Director

**Co-Director** 

Juan Lasheras, Director Medical Devices Center



Dean's Report Council of Advisors - May 23, 2008



# CISA3



Center of Interdisciplinary Science for Art, Architecture, and Archaeology



UCSan Diego Division, California Institute for Telecommunications and Information Technology

### **Freshman Enrollment And Trends**



## **Freshman Enrollment And Trends**



# **Jacobs School Undergraduate Enrollment**



Undergraduate Headcount

# **Jacobs School Graduate Enrollment**



talent and technology for the future

**Graduate Major Headcount** 

# **Female Engineering Students**

| Bachelor's | engineering | degrees | earned | by | women |
|------------|-------------|---------|--------|----|-------|
|------------|-------------|---------|--------|----|-------|

|                  | 2001   | 2002   | 2003   | 2004   | 2005   | 2006   |
|------------------|--------|--------|--------|--------|--------|--------|
| UC Berkeley      | 188    | 176    | 177    | 207    | 201    | 196    |
| UC Davis         | 111    | 120    | 105    | 137    | 134    | 121    |
| UC Irvine        | 60     | 54     | 66     | 93     | 83     | 94     |
| UC Los Angeles   | 96     | 101    | 116    | 119    | 123    | 96     |
| UC Riverside     | 13     | 28     | 16     | 13     | 16     | 22     |
| UC San Diego     | 71     | 85     | 95     | 112    | 172    | 162    |
| UC Santa Barbara | 17     | 23     | 39     | 25     | 37     | 41     |
| UC Santa Cruz    | 8      | 9      | 3      | 5      | 9      | 8      |
| UC total         | 564    | 596    | 617    | 711    | 775    | 740    |
| US total         | 11,914 | 12,687 | 12,970 | 13,257 | 13,197 | 13,300 |

Source: American Society for Engineering Education



**₹UCSD** | Corporate Jacobs | Affiliates Program



Innovation in Education: Team Internship Program Annual Growth



|                     | 2003 | 2004 | 2005 | 2006 | 2007 | 2008* |
|---------------------|------|------|------|------|------|-------|
| Students            | 3    | 18   | 35   | 50   | 61   | 63    |
| Teams               | 1    | 5    | 9    | 18   | 20   | 29    |
| Companies           | 1    | 5    | 8    | 14   | 15   | 14    |
| International Teams |      |      |      | 1    | 2    | 8     |

\* In progress



# **Team Internship Program:** International Team Projects 2008

### -----

### **Liechtenstein and Germany**

- Project #1: Create a more intuitive User Interface for HILTI's Anchor Design Software and test with clients
- Project #2: Define a design concept for an electrical plug system feasible for handheld electrical equipment in underground mining applications



- Project #1: Identify new product lines for Zeiss in the Personal Health market
- Project #2: Evaluate market opportunities for Zeiss in the Nanoparticles market

## **ResMed**

### Australia

• Optimize a nocturnal blood pressure monitoring device to monitor effects of blood pressure on sleep-disordered breathing



- Project #1: Enhance Universal Broadcast (Mobile TV) Module Performance Tools
- Project #2: Study and enhance various data streams over USB and SD/SDIO interfaces of the mobile phone / cellular modem
- •Project #3: Re-architecture of Data Networking API for the Qualcomm Component Model



# Team Internship Program: Annual Training Day 2008











talent and technology for the future

### **Dean's Report:**

# Jacobs School Graduation Ring Ceremony Continues...

- Who: Graduating Jacobs School Seniors, Friends, Family, Faculty, Staff and CAP!
- When: Saturday, June 14, 2:00pm-3:30pm

Where: Warren Mall





# **Faculty Presentation**

# Francine Berman, Ph.D. Professor, Computer Science & Engineering and Director, San Diego Supercomputer Center





### **Dr. Francine Berman**

Director, San Diego Supercomputer Center Professor and High Performance Computing Endowed Chair, UC San Diego



SAN DIEGO SUPERCOMPUTER CENTER



**Fran Berman** 

# SDSC's Mission: To transform research and education in the UC system and beyond through leadership in Cyberinfrastructure innovation, development and expertise



Nanomaterials



Climate modeling: Global warming



Earthquake dynamics; structural integrity of buildings, levees



Biofuels, Renewable energy



Disaster Response

| IT Training   | Database<br>management   | Data analytics             | Portals                            |
|---------------|--------------------------|----------------------------|------------------------------------|
| Visualization | SDSC Cyberi              | Green IT                   |                                    |
| Storage       | Performance optimization | Data and<br>Compute clouds | Data-<br>intensive<br>applications |



Genomics, Drug Design



AN DIEGO SUPERCOMPUTER CENTER

### At the Center: Integrated Portfolio of Information Technologies

### SDSC HIGH PERFORMANCE COMPUTING SYSTEMS

### DataStar

- 15.6 TFLOPS Power 4+ system
- 7.125 TB total memory
- Up to 4 GBps I/O to disk
- 115 TB GPFS filesystem

### Blue Gene Data

- "Data-intensive" Blue Gene configuration
- 17.1 TF
- 1.5 TB total memory
- 3 racks, each with 2,048 PowerPC processors and 128 I/O nodes

### • TeraGrid Cluster

- 524 Itanium2 IA-64 processors
- 2 TB total memory
- Also 16 2-way data I/O nodes http://www.sdsc.edu/ user\_services/

### SDSC DATA COLLECTIONS, ARCHIVAL AND STORAGE SYSTEMS

- 2.4 PB Storage-area Network (SAN)
- 25 PB StorageTek/IBM tape library
- HPSS and SAM-QFS archival systems
- DB2, Oracle, MySQL
- Storage Resource Broker
- Supporting servers: IBM 32-way p690s, 72-CPU SunFire 15K, etc.

Support for community data collections and databases

Data management, mining, analysis, and preservation

### http://datacentral.sdsc.edu/

### SDSC SCIENCE and TECHNOLOGY STAFF, SOFTWARE, SERVICES

- Data-oriented Community SW, toolkits, portals, codes
- DataCentral national hosting repository
- Chronopolis services (w/ UCSD Libraries)
- Data User Services
- Application/Community Collaborations
- Education and Training

### http://www.sdsc.edu/

SAN DIEGO SUPERCOMPUTER CENTER



**Fran Berman** 

# Coming this Summer: New SDSC Initiatives Harnessing the 2 Most Significant Trends in Information Technology

### Data Cyberinfrastructure

- Storage Backbone
- **University-level Archives**
- Integrated Data Life Cycle



### **Computing Cyberinfrastructure**

- **Cloud Computing** Platforms
- **PSDAF** and Petascale supercomputers
- UC Grid
- Chimico Comouration Condo / Co-lo Systems

**Opportunities for CI Innovation:** 

- Uninited Data **Applied Computer Science** 
  - Green Computing
  - Cloud computing
  - High Performance Computing

AN DIEGO SUPERCOMPUTER CENTER

UC SanDiego

Fran Berman

# On SDSC's Radar ...

- "Extreme" use of driving technologies
- Integrated Data Infrastructure
- Green Cyberinfrastructure





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Extreme Technology Use: Research applications often require more data, more compute cycles, more network bandwidth, more pixels, longer timeframes, than societal analogues ...







**Fran Berman** 

# SDSC Expertise and Advanced Services Focus on Driving Technologies



Long-term data preservation



Scalable algorithms, performance optimization for large-scale compute platforms



Sensor nets for realtime analysis and disaster response



Data visualization of large-scale data sets





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**Fran Berman** 

# Integrated Environment Required for Data Life Cycle Management



- Database selection and schema design
- Portal creation and collection publication
- Data analysis
- Data mining
- Data hosting
- Preservation services
- Domain-specific tools
  - Biology Workbench
  - Montage (astronomy mosaicking)
  - Kepler (Workflow management)
- Data visualization
- Data anonymization, etc.



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**Fran Berman** 

# HRONOPOLIS Data Preservation Services

- Geographically distributed preservation data grid that supports management, stewardship, access to digital collections over the long term
- System incorporates "trust" and reliability through replication, service level agreements, monitoring, rule-based systems, etc.



- **Project Partners:** SDSC, UCSD Libraries, NCAR, University of Maryland
- **Sponsoring Partners:** NSF, Library of Congress, National Archives and Records Administration
- **Data Partners:** ICPSR, CDL, Library of Congress, NCAR, NVO



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# **SDSC Green Infrastructure**

- SDSC is UCSD's largest data center, "living laboratory" for efficiency initiatives:
  - Hybrid displacement ventilation system to allow the building to thermodynamically "breathe"
  - Positioning of building sensors to measure energy consumption and thermal effectiveness
  - Green computing: Snavely and Rosing instrumenting SDSC machines to investigate "green applications" which maintain low power throughout execution
  - New SDSC building complex will house UCSD University Archives, co-location compute clusters, data analysis facility, etc.



- SDSC New "Green" Building:
  - 80,000 sq. ft. expansion awarded LEED Silver equivalent status
  - Will operate 53% more efficiently than California standards
  - Earned a California Public Utilities Commission "Best Practices Award" at the annual UC/CSU/CCC Sustainability Conference.



SAN DIEGO SUPERCOMPUTER CENTER

### **Fran Berman**

# **Upcoming Events at SDSC**

### Summer '08 San Diego Supercomputer Center



SDSC

SDS

Training workshops and seminars introduce new and current users to a wide array of topics pertaining to HPC, Data and Visualization. Users can attend weeklong Summer Camps and informal half-day seminars.

### SDSC Summer Training Camps

| WHEN         | WHAT                                                  | WHERE         |
|--------------|-------------------------------------------------------|---------------|
| June 23-27   | Intro to High-Performance Computing - CIEG            | SDSC Rm. 408  |
| June 23-27   | Introduction to Maya and 3D Modeling                  | SDSC Rm. 279  |
| July 7 - 9   | Flash Animation Creation for the Web                  | SDSC Rm. 279  |
| July 7-11    | Electronic Records Summer Camp - 1                    | SDSC Rm. 408  |
| Jul 28-Aug 1 | Computer Mapping: Going Digital to Discover Our Earth | SDSC Rm. 279  |
| August 4-8   | Electronic Records Summer Camp - 2                    | SDSC Rm. 408  |
| August 11-18 | GEON Institute - Geosciences Network                  | Atkinson Hall |

### Who can attend / Cost:

Check SDSC Training Website For Corresponding Links

### SDSC Seminar Wednesdays at the Price Center

| 5 con the billing                 | a) a contraction of France                            |
|-----------------------------------|-------------------------------------------------------|
| Advanced HPC                      | Science Gateways                                      |
| Data Mining                       | StarP for Matlab                                      |
| Scientific Workflows              | Portal Design & Development                           |
| Mashup Madness<br>Who can attend: | Visualization<br>UCSD students and faculty Cost: FREE |

More details and registration info can be found online at WWW.sdsc.edu/us/training

Questions? E-mail training-coord@sdsc.edu

www.edsc.edu -- UC San Diego, MC 0505 -- 5500 Gilman Drive -- La Jolla, CA 93093-0505 Tel. 858-534-5000 -- Fax. 858-534-5153 -- info@edsc.edu

# SDSC

# Mark Your Calendars: SDSC New Building Dedication October 14, 2008

### Questions? berman@sdsc.edu



### SAN DIEGO SUPERCOMPUTER CENTER

**Fran Berman** 



### CAP Business: Anne O'Donnell Director, Corporate Affiliates Program (CAP)





# 2008 results:

- ViaSat hosted lunch with faculty
- Keynote speaker on innovation from Northrop Grumman Space Technology
- YAHOO! and NORTHROP GRUMMAN Sponsorship
- You can sponsor the 2009 event!









|                      | 2006 | 2007 | 2008 |
|----------------------|------|------|------|
| <b>CAP</b> companies | 16   | 25   | 22   |
| Total companies      | 50   | 73   | 88   |
| Students             | 1500 | 2000 | 2500 |





# Triton Junkyard Derby 2008





# Thank You! Jacobs School Banquet: Destination Innovation











### **CAP Business:**

# CAP Services Review

- > 25 Days @ Jacobs
- ➢ 6 Corporate FESTS



- 2 Engineering Competitions: Qualcomm Chipset & Yahoo! Search Monkey Developers Contest
- Expand CAP connections to student leaders: Dinner with the Deans
- 1 Record Breaking Research Review





### U.S. Open Update June 9-15

- Anticipate <u>unprecedented</u> delays
- Peak traffic hours 7:30-11 a.m. and 3:30-6:30 p.m.
- You will be allowed on campus if displaying a valid parking permit
- A university ID or proof of UC business will be required to purchase parking permits from lot attendants
- Confirm appointments on campus prior to braving the ingress to campus!

### **CAP Business:** Anne O'Donnell, Director

# **Dates to Remember in 2008:**



June 14, 2008 July 16, 2008 July 18, 2008 Sept. 8, 2008 Oct. 2, 2008 Feb. 19, 2009 Jacobs School Graduate Ring Ceremony Von Liebig Technology Showcase Nanoengineering Workshop *Spirit of Solar* Cruise CAP Executive Board Meeting Research Expo



# **CSD** School of Jacobs Engineering