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

Thank you
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!*
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!

BD Biosciences

Hilti

Taccato Communications

UCSD Jacobs Corporate Affiliates Program
Staccato Communications

Ripcord™ Single-Chip All-CMOS

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, 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
**Ripcord® 2 Product Update**

- 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**

<table>
<thead>
<tr>
<th>MILESTONE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Tapeout</td>
<td>Done</td>
</tr>
<tr>
<td>Production Samples</td>
<td>June’08</td>
</tr>
<tr>
<td>Production Ramp</td>
<td>Q1’09</td>
</tr>
</tbody>
</table>
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
Dean’s Report:

Jacobs School of Engineering
Dean Frieder Seible
Jacobs School Ranked #10 in the World for Engineering, Technology and Computer Science

<table>
<thead>
<tr>
<th>World Rank In ENG</th>
<th>ARWU 2007 Rank</th>
<th>INSTITUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>Massachusetts Institute of Technology (MIT)</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Stanford University</td>
</tr>
<tr>
<td>3</td>
<td>26</td>
<td>University of Illinois - Urbana Champaign</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>University California - Berkeley</td>
</tr>
<tr>
<td>5</td>
<td>21</td>
<td>University of Michigan - Ann Arbor</td>
</tr>
<tr>
<td>6</td>
<td>38</td>
<td>University of Texas – Austin</td>
</tr>
<tr>
<td>7</td>
<td>60</td>
<td>Carnegie Mellon University</td>
</tr>
<tr>
<td>8</td>
<td>102-150</td>
<td>Georgia Institute of Technology</td>
</tr>
<tr>
<td>9</td>
<td>43</td>
<td>Pennsylvania State University - University Park</td>
</tr>
<tr>
<td>10</td>
<td>14</td>
<td><strong>University of California - San Diego</strong></td>
</tr>
<tr>
<td>11</td>
<td>50</td>
<td>University of Southern California</td>
</tr>
<tr>
<td>12</td>
<td>6</td>
<td>California Institute of Technology</td>
</tr>
<tr>
<td>13</td>
<td>35</td>
<td>University of California - Santa Barbara</td>
</tr>
<tr>
<td>13</td>
<td>37</td>
<td>University of Maryland - College Park</td>
</tr>
<tr>
<td>15</td>
<td>4</td>
<td>Cambridge University (UK)</td>
</tr>
</tbody>
</table>
1st UCSD research center to be named for corporate partner

**Founding Industry Members:**

[Images of Cymer and General Atomics]

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
2008 Invitrogen-UCSD Frontiers in Biotechnology Distinguished Seminar Series

Inaugural Keynote: Robert Langer, MIT
Engineering in Medicine
Organized Research Unit Established
May 2008

Shu Chien, Director

Shankar Subramaniam, Co-Director

David Cheresh, Co-Director

Juan Lasheras, Director
Medical Devices Center
Freshman Enrollment And Trends

![Bar chart showing freshman enrollment headcount from FA02 to FA08, with categories BENG, CSE, ECE, MAE, NE, and SE](image-url)
Freshman Enrollment And Trends

Graph showing enrollment trends for different programs from FY2002 to FY2008.

- BENG, 289
- MAE, 229
- CSE, 147
- ECE, 116
- SE, 77
- NE, 51
Jacobs School Undergraduate Enrollment

Undergraduate Enrollment by Field:

- **BENG**
- **CSE**
- **ECE**
- **MAE**
- **SE**

**Undergraduate Headcount**

<table>
<thead>
<tr>
<th>Year</th>
<th>BENG</th>
<th>CSE</th>
<th>ECE</th>
<th>MAE</th>
<th>SE</th>
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<tr>
<td>FA2002</td>
<td>746</td>
<td>1,150</td>
<td>1,309</td>
<td>799</td>
<td>280</td>
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<tr>
<td>FA2003</td>
<td>885</td>
<td>1,077</td>
<td>1,136</td>
<td>930</td>
<td>303</td>
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<tr>
<td>FA2004</td>
<td>952</td>
<td>949</td>
<td>937</td>
<td>1,036</td>
<td>399</td>
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<tr>
<td>FA2005</td>
<td>995</td>
<td>773</td>
<td>673</td>
<td>1,155</td>
<td>439</td>
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<tr>
<td>FA2006</td>
<td>879</td>
<td>682</td>
<td>567</td>
<td>1,225</td>
<td>467</td>
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<tr>
<td>FA2007</td>
<td>878</td>
<td>598</td>
<td>508</td>
<td>1,250</td>
<td>483</td>
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</table>

*UCSD Jacobs Corporate Affiliates Program*

talent and technology for the future
Jacobs School Graduate Enrollment

Graduate Major Headcount

- BENG
- CSE
- ECE
- MAE
- SE

UCSD Jacobs Corporate Affiliates Program

talent and technology for the future
Female Engineering Students

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

Source: American Society for Engineering Education
Innovation in Education: Team Internship Program Annual Growth

<table>
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<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008*</th>
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<tbody>
<tr>
<td>Students</td>
<td>3</td>
<td>18</td>
<td>35</td>
<td>50</td>
<td>61</td>
<td>63</td>
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<tr>
<td>Teams</td>
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<td>5</td>
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<td>18</td>
<td>20</td>
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<tr>
<td>Companies</td>
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<td>5</td>
<td>8</td>
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<td>15</td>
<td>14</td>
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<tr>
<td>International Teams</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>

* 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

Australia

- 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

Zeiss

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

Qualcomm Incorporated

- Project #1: Identify new product lines for Zeiss in the Personal Health market
- Project #2: Evaluate market opportunities for Zeiss in the Nanoparticles market
- Project #3: Re-architecture of Data Networking API for the Qualcomm Component Model
Team Internship Program:
Annual Training Day 2008
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
Next Generation Cyberinfrastructure at SDSC

Dr. Francine Berman
Director, San Diego Supercomputer Center
Professor and High Performance Computing Endowed Chair,
UC San Diego
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
- SDSC Cyberinfrastructure
- IT Training
- Database management
- Data analytics
- Storage
- Performance optimization
- Data and Compute clouds
- Green IT
- Data-intensive applications
- Genomics, Drug Design

Fran Berman
# 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/](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.

[http://datacentral.sdsc.edu/](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/](http://www.sdsc.edu/)
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
- Condo / Co-lo Systems

Opportunities for CI Innovation:
- Applied Computer Science
- Green Computing
- Cloud computing
- High Performance Computing
On SDSC’s Radar …

• “Extreme” use of driving technologies

• Integrated Data Infrastructure

• Green Cyberinfrastructure
Extreme Technology Use: Research applications often require more data, more compute cycles, more network bandwidth, more pixels, longer timeframes, than societal analogues …
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 real-time analysis and disaster response

Data visualization of large-scale data sets
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.

File systems, Database systems, Collection Management Data Integration, etc.

Many Data Sources

modeling

analysis

simulation

visualization

Computation

Sensor-nets

computers

Integrated Infrastructure

Data Access

Data Use

Data Management

Data Storage
• 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
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.
Upcoming Events at SDSC

Summer ‘08
San Diego Supercomputer Center

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

SDSC Summer Training Camps

<table>
<thead>
<tr>
<th>WHEN</th>
<th>WHAT</th>
<th>WHERE</th>
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<tbody>
<tr>
<td>June 23-27</td>
<td>Intro to High Performance Computing - CIEG</td>
<td>SDSC Rm. 498</td>
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<tr>
<td>June 23-27</td>
<td>Introduction to Maya and 3D Modeling</td>
<td>SDSC Rm. 279</td>
</tr>
<tr>
<td>July 7 - 9</td>
<td>Flash Animation Creation for the Web</td>
<td>SDSC Rm. 799</td>
</tr>
<tr>
<td>July 7 - 11</td>
<td>Electronic Records Summer Camp 1</td>
<td>SDSC Rm. 408</td>
</tr>
<tr>
<td>Jul 28-Aug 1</td>
<td>Computer Mappings: Going Digital to Discover Our Earth</td>
<td>SDSC Rm. 279</td>
</tr>
<tr>
<td>August 4 - 8</td>
<td>Electronic Records Summer Camp 2</td>
<td>SDSC Rm. 408</td>
</tr>
<tr>
<td>August 11-18</td>
<td>ERON Institute - Geosciences Network</td>
<td>Atkinsson Hall</td>
</tr>
</tbody>
</table>

Who can attend / Cost:
Check SDSC Training Website For Corresponding Links

SDSC Seminar Wednesdays at the Price Center
Starting July 2, 2008 from 12:00 – 4 p.m.
Advanced HPC  Science Gateways
Data Mining   StarP for Matlab
Scientific Workflows  Portal Design & Development
Mashup Madness  Visualization

Who can attend: 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

Mark Your Calendars:

SDSC
New Building Dedication
October 14, 2008

Questions? berman@sdsc.edu
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!
<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
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<tbody>
<tr>
<td>CAP companies</td>
<td>16</td>
<td>25</td>
<td>22</td>
</tr>
<tr>
<td>Total companies</td>
<td>50</td>
<td>73</td>
<td>88</td>
</tr>
<tr>
<td>Students</td>
<td>1500</td>
<td>2000</td>
<td>2500</td>
</tr>
</tbody>
</table>
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 unprecedented 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: Jacobs School Graduate Ring Ceremony
- July 16, 2008: Von Liebig Technology Showcase
- July 18, 2008: Nanoengineering Workshop
- Sept. 8, 2008: Spirit of Solar Cruise
- Oct. 2, 2008: CAP Executive Board Meeting
- Feb. 19, 2009: Research Expo