CSE Department Chairman Keith Marzullo and the Ukulele Class of 2010 for sharing their musical talents!
CAP Leadership 2009 - 2010

CAP Chairman:
Danny Brown, Ph.D.
VP Technology Development,
Cymer

CAP Vice Chairman:
Anton Monk, Ph.D. UCSD ‘94
Co-founder & VP Technology
Entropic Communications
Welcome New CAP Executive

Leo Holland
Head of Advanced Projects
Advanced Technologies Group
General Atomics
Welcome New CAP Executive

Jason Butchko
VP and GM, Networks
Ideal Industries
Welcome New CAP Member!

Mike Andrews, Ph.D.
Chief Technology Officer
L-3 Communications
Welcome New CAP Members!
Welcome Distinguished Students

- Jacobs School Scholars and Fellows

- New TESC President: Jack Ly, MAE ’11

- IEEE President: Jordan Rhee, ECE’10
Jack Ly, NEW TESC President, MAE ‘11
jkly@ucsd.edu
http://tesc.ucsd.edu/
ViaCar Competition

1. UCLA (7ft/s)
2. UCSD (5ft/s)
Technical Workshops

ARM Workshop

Cypress PSoC Workshop
International Robotics Competition

Autonomous Ground Vehicle

Interdisciplinary Project

Highly Challenging

Lots of Fun
Thank you!
Dean’s Report

Dean Frieder Seible
Jacobs School of Engineering
Engineering Building Unit IV

Home for NanoEngineering, Structural Engineering, Visual Arts Studios
Serving: 1180 students; 50 faculty
Construction expected to be completed 2012/2013
Architects: Muller/Hull and Safdie Rabines Architects

http://smeb-bldg.ucsd.edu/view/viewer_index.shtml?id=593
## Team Internship Program Preview 2010

<table>
<thead>
<tr>
<th>Team Internship Program</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>*2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>3</td>
<td>18</td>
<td>35</td>
<td>50</td>
<td>61</td>
<td>72</td>
<td>93</td>
<td>120</td>
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<tr>
<td>Teams</td>
<td>1</td>
<td>5</td>
<td>9</td>
<td>18</td>
<td>20</td>
<td>29</td>
<td>37</td>
<td>52</td>
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<tr>
<td>Companies</td>
<td>1</td>
<td>5</td>
<td>8</td>
<td>14</td>
<td>15</td>
<td>14</td>
<td>16</td>
<td>39</td>
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<tr>
<td>New sponsors</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>23</td>
</tr>
<tr>
<td>Returning sponsors</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>11</td>
<td>11</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>Multiple teams</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>8</td>
<td>7</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International teams</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>

* In progress

We make it visible.

---

**Corporate Affiliates Program**

connecting you to talent and technology...
Team Internship Program Summer 2010
52 Teams, 39 Companies
6 International Teams

Schaan, Liechtenstein

Beijing, China

Osaka, Japan

Guangzhou, China

Shenzhen, China

Seoul, Korea
I naugural NanoEngineering Class

Starts Fall 2010:
• 13 students already enrolled
• Advanced Degree Program Approved yesterday!

Objectives:

• Provide grounding in nanoscale science and engineering, with understanding of materials at the atomic and nanometer scales, including the relationship between the scale and the properties of materials.

• Educate a new generation of engineers who can seed high-technology companies as nanotechnology results in a new industrial revolution.

• Form strong multidisciplinary educational links through joint team projects that cross the traditional areas of science and engineering.
Master of Advanced Studies Degree Program

- Finish in 2 years (9 courses, 36 units), team project
- Targeted to professional engineers: convenient course times
- Lectures available online

Approved (Pending UC Presidential Signature)
Architecture-Based Enterprise Systems Engineering (Computer Science/Mechanical and Aerospace Engineering)

Submitted for Approval
- Wireless Embedded Systems (Electrical and Computer Engineering/Computer Science Engineering)
- Medical Devices (Mechanical Engineering/Bioengineering)
- Simulation Based Engineering (Structural/Mechanical and Aerospace Engineering)
- Structural Health Monitoring (Structural/Electrical and Computer Science/Mechanical and Aerospace Engineering)
Faculty Proposed Recruitment In Our Focus Areas

1. Applied Algorithms (software/graphics)
2. Excellence FTE (diversity leadership)
3. Biochemical, Bioelectronics/optics OR Neuroengineering
4. Aviation safety of composite structures
5. Environmental engineering (modeling)

Requests for Future Hiring
- Excellence FTE (visiting)
- Embedded systems (healthcare systems)
- Nanotechnology (energy/environment)
- Electronic devices and materials
- Chemical engineering
- Structural safety/blast mitigation
- Mechanics/design
Jacobs School New Undergraduate Engineering Enrollment

*subject to 3rd week enrollment changes in fall
Possible Strategies to Improve Recruiting and Retention of Underrepresented Students

- **Role Models and Mentoring for Retention**
  - Faculty Recruitment
  - Visiting Faculty and Scholars
  - Alumni and Industry Connection
  - Peer Tutoring Program
  - Workshops and seminars

- **Scholarships/Fellowships for Recruiting**

- **Center to Focus Efforts**

*Ideas and Support from Industry Partners Needed and Welcome!*
Distinguished Faculty Presentation

Professor Jan Kleissl
Mechanical & Environmental Engineering
UC San Diego

“Data Aggregation for Cloud Prediction”

http://solar.ucsd.edu
Thesis

• Solar forecasting critical for integration of renewables
• Wind forecasting well established
• Solar forecasting:
  – different techniques required
  – shortage of solar ground measurements
• Solution: aggregate existing metered PV data
The Problem
Existing Forecast Products

Typical errors (RMSE) for hourly GHI forecasts: 20-40%

Satellite cloud maps
Numerical weather forecast
The plight of Solar Data

- Weather forecasting improves due to better models and assimilation of >5M datapoints every day.
- However, how many real-time measured solar irradiance data in California?
PV Systems in San Diego County

Map courtesy of CCSE
Working the Magic

azimuth, tilt, rated efficiency, shading, location

Power (kW)

- Fri 2009-03-06
- Sat 2009-03-07
- Sun 2009-03-08
- Mon 2009-03-09
- Tue 2009-03-10

- DJI
- GHI, DNI
- clearness index
- PV temperature
- tilt
- azimuth

PVWATTS

Units = kW by day

© 2016 INEGI
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© 2016 Google
Data SIG. NCDC. US "New NOAA. CERES"
Solar Forecasting

- Meteorological models > 5 hrs
- Satellite cloud maps 30 min – 5 hrs
- Sky Imagers 30 sec – 1 hr
- Network of point sensors up to 5 hrs

Enable data aggregation to validate forecast models
UC San Diego Testbed

- Network of ground sensors
- Use PV output as solar sensor
- Detect pattern, calibrate satellite & sky imager
Total Sky Imager: Cloud Detection
Cloud Identification

- Use red / blue ratio to identify cloud
- Compute cloud velocity and direction
Conclusions

• New tools required for solar forecasting
• Aggregate sky imagery, satellite, with ground measurements of PV output
• Demonstrate in testbeds
• Enable / require data sharing (e.g. CSI PDP)
Acknowledgements

- PhD Students: Chi Wai Chow, Anders Nottrott, Matthew Lave, Patrick Mathiesen (all UCSD)
- Funding from DOE High Solar PV Penetration, CEC, CSI
- Byron Washom
Anne O’Donnell
Director,
Corporate Affiliates Program (CAP)
2010 results:

• ‘Outstanding Poster’ highlights Jacobs Solar Energy research
• Keynote speaker on Energy and America from the National Academy of Engineering
• 4 CAP sponsors
  
  Q u a l c o m m ,  V i a S a t ,  N o r t h r o p  G r u m m a n ,  B D

• You can sponsor the 2011 event

  (celebrating UC San Diego’s 50th year and Research Expo’s 30th)
Embedded Systems Lab

Officially Open!
Inaugural event was May 25th, 2010

- Embedded computer systems and sensor networks at the forefront of wireless computing:
  - Hardware synthesis, Theory, Algorithms
  - Energy efficiency
  - Location awareness
  - Sensor networks and actuation
  - High level synthesis for System-on-chip (SoC) design
  - Non-volatile memories systems
Team Internship Program (TIP) Training

• TIP team members meet for the first time and receive an overview of program requirements.

• Team dynamics
  • Understand and appreciate different learning and communication styles
  • Build high performing teams for the summer

• Business etiquette and success on the job
  “How to be a Star on the Job”

• Q&A with TIP alumni panel
Gordon Engineering Leadership Center Update

SPAWAR Chief Engineer, Rear Admiral Jerry Burroughs, presented keynote at Gordon Leadership Center Forum, April 7th

Accepting Professional Scholar Applications for Fall’10
gordoncenter.ucsd.edu

- 8+10* Undergraduate Student Scholars
- 12+10* Graduate Student Scholars
- 1 Professional Scholars

*Applicants currently under review
Graduation Ring Ceremony
June 12, 2010 – 8:00pm

Guest Speaker:
Greg Papadopoulos UCSD ‘79
New Enterprise Associates, Inc. and
Former CTO Sun Microsystems
Jacobs Graduate Student Council

**Evening at Jacobs**

*Green Engineering Focus*

July 21st, 2010, 5:30-7pm
Jacobs Hall (EBUI) - Qualcomm Conference Center

**Agenda:**

- Graduate Research Presentations
- Table discussions
- Council report
CAP Business

Dates to Remember in 2010:

June 12  
Ring Ceremony, RIMAC Arena, 8PM

July 21  
Jacobs Graduate Student Council Evening with Jacobs Green Engineering

September - June 2011: UC San Diego 50th Anniversary Celebration

September 22  Spirit of Solar Cruise on San Diego Bay

Oct 7  
CAP Executive Board Meeting
Thank you CAP 2009 - 2010 Leadership

CAP Chairman:  
Danny Brown, Ph.D.  
VP Technology Development, Cymer

CAP Vice Chairman:  
Anton Monk, Ph.D. UCSD ’94  
Co-founder & VP Technology 
Entropic Communications