CAP Chairman and Vice Chairman

Nik Devereaux
Director of Software Engineering
Viasat

GB Singh
Director, Package & Systems Engineering
Solar Turbines

Welcome
WELCOME NEW CAP PARTNERS
WELCOME TRITON ENGINEERING STUDENT COUNCIL

TESC
Triton Engineering Student Council
We empower engineers.

Jonathan Luck, President; Senior, Computer Science
Summer Batasin, VP External; Senior, Bioengineering
What is TESC?

The Triton Engineering Student Council (TESC) empowers UC San Diego engineering students by connecting them with impactful communities, projects, and career building opportunities.

We do this through:

1. Hosting events for engineering students
2. Supporting 40+ engineering student organizations
3. Advocating for engineering students
TESC always values insight and support from industry. Working with industry partners enables us to support the engineering community and prepare students for their post-college careers.

Interested in collaborating?

sponsor@tesc.ucsd.edu -- TESC Sponsorship Team
summer@tesc.ucsd.edu -- TESC VP External
jonathan@tesc.ucsd.edu -- TESC President
WELCOME SOLAR TURBINES CO-OP TEAM

Garrett Tse, Senior, Environmental Engineering
Kenneth Icayan, Senior, Aerospace Engineering
UC San Diego
Jacobs School of Engineering Co-op
Additive Manufacturing

Garrett Tse, Senior, Environmental Engineering
Kenneth Icayan, Senior, Aerospace Engineering
PROJECT OVERVIEW

How do we utilize 3D Printers to:

- Improve design
- Reduce cost
- Increase production

Project Goals:

- Explore a list of parts
- Provide a process map for AM
- Outline overall benefits

1) Lube Oil Manifold (Design Process)
2) Exhaust Joint Bellow (Solving Specific Problems)
LUBE OIL MANIFOLD

**Why Optimize:**
- Strange Geometry
- Made from “off the shelf” parts
- Large Assembly

*Manifold shown in gold*
EXHAUST JOINT

Why Optimize:
- Thermal stress in corners
- Cracking in the metal frame
- Expensive: $20000-$50000

Previous Findings:
Rounding edges:
Lowers max stress by 26%

Adding mass at stress concentrations:
Lowers max stress by 43%

Printing Corner Piece:
- Added mass support
- Rounded edges
- Increased wall thickness

50 - 60% Improvement!
OVERCOMING CHALLENGES

**Project**

**New Technology:**
Prices are improving, analysis tools in development

**Current Printing Size:**
Parts from Solar’s Packaging are relatively large

**Designing For AM:**
Understanding/applying printing limitations to designs

**Co-Op Experience**

**First industry experience:**
Applying concepts to real world situations

**Learning New Software:**
Creo, ANSYS, FEA, CFD

**Working Environment:**
Adapting from college to corporate environment
CO-OP HIGHLIGHTS

Working with a variety of engineers and manufacturers

Working with emerging technology

Free Coffee!

Thank you:
  • Dean Pisano and MAE Chair Coimbra
  • Corporate Affiliates Program
  • GB Singh and Solar Turbines!
Dean’s Report

Albert P. Pisano
Dean, Jacobs School of Engineering

Accelerating the March to Cachet
Institute for Materials Discovery and Design

Apply machine learning and rapid materials synthesis/characterization to accelerate development of novel functional materials for energy, information technology, medicine and more.

Shirley Meng, Prof of NanoEngineering

Michael Sailor, Prof of Chemistry
New Rady School of Management
Dean Lisa Ordóñez

Continuing Partnership through
Institute for the Global Entrepreneur

Please Join Us!
IGE Technology Showcase
November 1
Atkinson Hall

Contact:
Dennis Abremski
Executive Director, IGE
dabremski@eng.ucsd.edu
Institute for the Global Entrepreneur

Serving more than 100 Teams & Startups in Energy, Medtech, AI and Nanotech

• **Technology Management & Entrepreneurism Education** with Rady School of Management

• **Technology Accelerator** – For teams to develop prototypes and validate with industry partners, refine business plans, build teams and engage investors.

• **MedTech Accelerator** – New Partnership with Altman Clinical Translational Research Institute to be announced November 1
Convergent Systems Engineering Update

• Faculty Leadership: Cluster of 5 New Hires Underway

• Academic Coordinator (Rick Gessner) working with three departments on curricula plans: ECE, MAE, SE

• “Topics in Systems Engineering” industry guest lectures Fall 2019
2019 New Faculty Hires

New Faculty Welcome:
October 17, 2019 at 5:00pm
Welcoming our Incoming Academic Leadership

Christine Alvarado
Associate Dean
Students

Karen Christman
Associate Dean
Faculty Affairs & Welfare

Bill Lin
Department Chair
Electrical & Computer Engineering

Shaochen Chen
Department Chair
NanoEngineering
Research Funding Growth: New Awards

FY2015: $48.4M
FY2016: $46.2M
FY2017: $56.9M
FY2018: $60M
FY2019: $98.1M

FY19Q2, Total Dollars Authorized by Sponsor, awards and supplements. Source, UC San Diego Office of Contract and Grant Administration
The Jacobs School of the next Decade: 2020 Strategic Plan

Sustained Performance Reputation (10 Yrs)
Sustained Reputation Cachet (20 Yrs)

• One of the nation’s largest engineering schools, providing leadership, talent and technology at scale.
• Graduates recognized for core engineering knowledge that enables them to solve new problems
• Working with industry is part of our DNA drive towards relevance and cachet
• No silver bullet—broad set of coordinated efforts
• Striving toward recognition (not ranking)
Franklin Antonio Hall
GROUNDBREAKING CELEBRATION | NOVEMBER 15, 2019
Guidelines for Design

• Maximize the circulation of people and ideas
• Flexible laboratories to stand the test of time
• Welcoming to industry partners
• Benefits the entire Jacobs School
Research Vision for the Digital Future

- Precision Healthcare
- Distributed Renewable Energy
- Smart Materials
- Autonomy

- Machine-integrated Security
- Cryptography
- Privacy
- Authentication

- Sensors
- Hardware
- Machine Vision
- 5G Networks

- Data Science
- Machine Learning
- Edge Computing
- Bioinformatics

Commericalization
Collaboratories for the Digital Future

Machine-Integrated Computing and Security

Convergent Systems Engineering

Halıcıoğlu Data Science Institute

Wearable Sensors

High Energy Density Science

NanolImmunno Engineering | IEM

Precision Genomics | Salk

Contextual Robotics Institute

Sustainable Power and Energy

Wireless Communications
Drive Relevancy and Ensure Exponential Impact

- **Transformative**
  - Partner ecosystem to drive innovation in blue sky verticals

- **Strategic**
  - Holistic, sustained institutional relationship with multiple points of engagement

- **Tactical**
  - Company looks to campus for specific research expertise & talent pipeline

- **Opportunistic**
  - Single point connection between professor and project manager
A Single Point Connection with an Expert Faculty Member is Necessary, but not Sufficient

“We sponsor more than 500 projects at about 100 universities. But somehow we feel we are not fully leveraging our investment.

We are changing course and instead building trusted strategic relationships with selected schools.”

Global Partner Company in current negotiations with Jacobs School for strategic relationship
Jacobs School Corporate Affiliates Program is a National Model for University-Industry Partnerships

• Dedicated team works with company to develop annual engagement plan

• 90% retention of industry members year over year

• Benchmarked by national engineering schools
16 Agile Research Centers and Institutes

**New**
- Machine Integrated Computing and Security
- Wearable Sensors
- Contextual Robotics Institute
- Visual Computing
- Nano Immuno-Engineering
- Microbiome Innovation
- CHO Systems Biology
- Extreme Events Research
- Engineered Natural Intelligence (AI)
- Sustainable Power and Energy
- Institute for Materials Discovery and Design

**Existing**
- Center for Wireless Communications
- Center for Networked Systems
- Institute for Engineering in Medicine
- Center for Memory and Recording Research
- Qualcomm Institute
70+ New Relationships Enable Use-Driven Research
Strategic Relationship Characteristics

• Clear sense of mutual benefit to both the Jacobs School and the Partner
  • Advances research and education mission for public good
  • Synergistic with corporate roadmap

• Holistic and coordinated institutional approach engaging multiple corporate divisions to reach goals.
  • Human Resources
  • Research and Development
  • Business Development
  • Community Relations
  • New Ventures

• Sustained, multi-year engagement with branded Corporate Presence on campus
Collaboratories for the Digital Future: Innovation Ecosystems

1. Mobile AI at the Edge

2. Connected Health

3. Smart, Safe, Sustainable Mobility

4. Materials Design & Discovery
Collaboratories for the Digital Future: Innovation Ecosystems

1. Mobile AI at the Edge
2. Connected Health
3. Smart, Safe, Sustainable Mobility
4. Materials Design & Discovery
5. Precision Medicine for Infections Diseases (?)
Faculty Presentation

Nicole Steinmetz
Professor, NanoEngineering
Director, Center for Nano Immuno-Engineering

NanoEngineering Gone #Viral
CAP Executive Input: Innovation Ecosystems

Discussion Topic:

What other emerging innovation ecosystems should the Jacobs School pursue?
CAP Business

Wil Dyer
Director, Corporate Affiliates Program

CAP News & Updates
CAP Talent Programs

We help you define and execute your talent acquisition strategy on campus

• Corporate Day@Jacobs
• Tech Talks
• Information Sessions
• Professional Student Organizations
• Internships & Full-time jobs
• Team Internship Program (TIP)
• Cooperative Education (Co-op)

Top CSE students network with CAP Partners at CSE Tutor Networking Night
Team Internship Program (TIP)

- 2-5 members; Undergraduate, Masters, and Ph.D. Levels
- All engineering majors - we encourage multi-disciplinary teams; other majors on occasion
- Paid Internships, 10-12 weeks over the summer
- Full-time, i.e., 40 hour/week commitment

Cooperative Education (Co-op)

- First in the UC System
- Cohort #2: June-December 2020
- CSE, MAE, ECE only
- Full-time (30-40 hours per week) for up to 6 months - Summer and Fall quarters
- Undergraduate only - any year, international students included

### Recruiting Timeline

<table>
<thead>
<tr>
<th>Month</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>October - December</td>
<td>Companies include TIP/Co-op in budget planning. Companies define and submit projects and recruitment starts</td>
</tr>
<tr>
<td>January - March</td>
<td>Companies continue to submit their projects and recruitment continues; offers extended</td>
</tr>
<tr>
<td>April</td>
<td>Finalize recruitment &amp; offers</td>
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<tr>
<td>May</td>
<td>Selections completed Intern pre-deployment training</td>
</tr>
<tr>
<td>June - December</td>
<td>TIP period during 10-12 consecutive weeks (Jun-Sept) Co-op period up to 6 months (Jun-Dec)</td>
</tr>
</tbody>
</table>
New Jacobs School Student Recruitment Database

- Post full/part-time opportunities, internships, TIP & Co-op
- Proactively identify qualified students through tailored resume book
- Request/sign up for targeted recruiting events and promote to students

More Information:

Rocio de Lis
Assistant Director
Corporate Affiliates Program - Talent Programs
mdelis@eng.ucsd.edu

http://jacobsschool.ucsd.edu/talent
Core Research Invitations for CAP Executives

Center for Wearable Sensors  
(cws.ucsd.edu)  
*October 23, 2019*

Contextual Robotics Institute  
(cri.ucsd.edu)  
*November 7, 2019*

Machine-Integrated Computing & Security  
(mics.ucsd.edu)  
*November 13, 2019*

Center for Engineered Natural Intelligence  
(ceni.ucsd.edu)  
*January 28-29, 2020*
200+ GRADUATE-LEVEL RESEARCH POSTERS
ENGINEERING FACULTY PRESENTATIONS
CONNECT WITH STUDENTS, FACULTY AND INDUSTRY!

Call for: 1. CAP Partner Sponsorship & 2. CAP Executive Distinguished Judges
MAE 156B: Senior Design Course
Industry Sponsored Projects

What the Course Provides

• Teams of 3-6 students
• 15 week project durations
• Deliver working prototype to sponsors
• IP assigned to sponsor
• Parts Budgets range: $1,000 to $10,000
• Shared Shop Expense: $1,800
• Title due in October 7 and January 7

Projects can be interdisciplinary

• Mechanical
• Electromechanical
• Fluid mechanics
• Heat transfer
• Computer Control

For more information contact:
Nathan Delson PhD, ndelson@ucsd.edu
Jerry Tustaniwskyj PhD, jtust@eng.ucsd.edu
Sample MAE 156B Projects

Teradata
Server Rack
Cabinet Movers

Delta Design
IC Testing & Handling

NAVWAR
Surface Towed Geolocation System, Robotically Controlled ATV

ATA Engineering
Modal Analysis Shaker
## All Upcoming Events

<table>
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<tr>
<th>Date</th>
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<tr>
<td>October 14, 2019</td>
<td>Systems Engineering Seminar: Sagnik Nandy, Google</td>
</tr>
<tr>
<td>October 17, 2019</td>
<td>New Faculty Welcome</td>
</tr>
<tr>
<td>October 17-18, 2019</td>
<td>Center for Memory &amp; Recording Research (CMRR.ucsd.edu) Research Review</td>
</tr>
<tr>
<td>October 23, 2019</td>
<td>Center for Wearable Sensors (CWS.ucsd.edu) Research Summit</td>
</tr>
<tr>
<td>October 25-27, 2019</td>
<td>SD Hacks – student-run hack-a-thon</td>
</tr>
<tr>
<td>November 1, 2019</td>
<td>Institute for the Global Entrepreneur (IGE.ucsd.edu) Start-up Showcase</td>
</tr>
<tr>
<td>November 7, 2019</td>
<td>Contextual Robotics Institute (CRI.ucsd.edu) Forum</td>
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<tr>
<td>November 15, 2019</td>
<td>Franklin Antonio Hall Groundbreaking Ceremony – by CAP invitation only</td>
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<tr>
<td>November 20, 2019</td>
<td>Center for Wireless Communications (CWC.ucsd.edu) Research Review</td>
</tr>
<tr>
<td>December 5, 2019</td>
<td>National Academy of Engineers (NAE) Celebration</td>
</tr>
<tr>
<td>January 28-29, 2020</td>
<td>Center for Engineered Natural Intelligence (CENI.ucsd.edu) Research Summit</td>
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<tr>
<td>February 6, 2020</td>
<td>Winter CAP Executive Board Meeting</td>
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<tr>
<td>April 16, 2020</td>
<td>Jacobs School Research Expo</td>
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</tbody>
</table>
Thank you!

Next Board Meeting:
February 6, 2020