UC San Diego Jacobs School of Engineering

Welcome CAP Executive Board October 30th, 2014

CAP Leadership - update





Cody Noghera Director Corporate Affiliates Program Jacobs School of Engineering

Anne O'Donnell Executive Director Corporate Research Partnerships Jacobs School of Engineering



Message from Rich Goldberg, Outgoing CAP Executive Chairman



Thank You!

CAP Executive Leadership 2014 - 2015



CAP Chairman: *Jeff Carter* _{CS Alumnus} '86 *Vice President and General Manager of Teradata Platforms*



CAP Vice Chairman: Mark Ambrose San Diego Site Executive, Raytheon



Solar Turbines Thank you David Hadacek and Ennodio Ramos Solar Turbines for 'Spirit of Solar' Cruise September 22, 2014











Welcome New CAP Members!





ACCESS, CONNECTION, VOICE

Welcome Distinguished Students

Triton Engineering Student Council (TESC)

Team Internship Program Students





Welcome Distinguished Students - Team Internship Program

Team Internship Program builds the next generation of engineers

330 Students | 82 Teams | 42 Companies



Jacobs School of Engineering CORPORATE AFFILIATES PROGRAM

Team Internship Program – Featured Presentations



Cubic Transportation Systems Android NFC Host card emulation

Daniel Mariano, Computer Science Senior Frank Chao, Computer Science Senior Navjot Cheema, Computer Science Senior Ruochen Yang, Computer Science Senior



UTC Aerospace Systems High-rate, Low-cost cascades

Tayelor Mckay, Aerospace Engineering Senior Shawn Mailo, BioEngineering, Masters Jennifer Davis, Structural Engineering Senior Katherine Riley, Structural Engineering Senior





Emulating transit passes using HCE

Cubic Transportation Systems Presented by: Navjot Cheema, Frank Chao, Yang Ruochen, Daniel Mariano



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Features and purpose

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.Host Card Emulation (HCE) simulates a virtual smart card using only software

.Demonstrate that our application allows HCE-compatible android devices to safely emulate transit passes as an alternative to using Secure Element Implement a secure soft token architecture and establish communication between the android device and reader



HCE:

NFC & device Communication









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ACCESS, CONNECTION, VOICE

UTC Aerospace Systems 2014 TIP Team

High Rate Low Cost Structural Cascade

Jennifer Davis Shawn Mailo Tayelor McKay Katie Riley

320

Structural Engineering Mechanical Engineering Aerospace Engineering Structural Engineering

A320AIRE

Sreeni Narayanan Judd Frost Project Advisor Project Advisor

Background

Cascades

- Key Component of Thrust Reverser:
- Redirects airflow to generate reverse thrust while avoiding impingement on structure
- Current manufacturing method is slow and costly



Image from UTC Aerospace Systems





UC San Diego

Objective

 Explore and evaluate advanced manufacturing technologies for cost-effective fabrication of cascades relative to current technologies in use





Research

– 57 manufacturing methods researched

Process | Materials | Tolerances | Advantages and Disadvantages



- Contacted 75 suppliers, obtained 16 non-disclosure agreements



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Ranking methodology

Criteria....

Weighted:

Recurring cost

Weight

Supplier base

Initial cost

MRL/TRL

Tolerance

Precedent in aerospace



<u>Required</u>:

- Temperature requirement
- Corrosion resistant
- Abrasion resistant
- Structural integrity

Results

- Identified two technologies with savings potential of up to 40% over 19 years
- Further analysis needed to determine structural integrity, exact costs



Dean's Report



Dean Albert P. Pisano Jacobs School of Engineering



Jacobs School of Engineering CORPORATE AFFILIATES PROGRAM

World-Class Engineering School



#20 among World-Wide engineering schools

U.S. News ranking of Best Global Universities, 2014

#7 among U.S. engineering schools

U.S. News ranking of Best Global Universities, 2014

#5 among U.S. best public engineering schools

U.S. News ranking of Best Global Universities, 2014



Jacobs School 2020 Plan by the Numbers

	2013	2014	2020
Faculty	201	214	250
Undergraduates	6,500	6,833	5,000
Ugrad/Faculty	32:1	31:1	20:1
Masters & Ph.D.	1,715	1,850	2,500
Graduate/Faculty	8.5:1	8.6:1	10:1



Jacobs School Hires 19 New Faculty



George Porter



Julian McAuley



Jesse Jokerst



Stephanie Fraley



Padmini Rangamani



Leo Porter



John McCartney



Daniel M. Kane



Nuno Bandeira



Antonio Sanchez



Ravi Ramamoorthi



Mia Minnes



Aaron Drews



Yi Chen



Michael Tolley



Prashant Mali



James Friend



David Fenning



Jiun-Shyan Chen



Jacobs School Strategic Vision

Focus Look, Think and Act as a Top 10 Professional Engineering School

Strategies

Strategic Institutes Cross-campus education/research/practice collaborations

Agile Research Centers Systems-level engineering research with industry partners

Experience Engineering Education Design/build/test project courses, beginning in freshman year

Values Engineering for the Global Good

Exponential Impact through Entrepreneurism

Collaboration to Enrich Relevance



One University: Collaboration to Enrich Relevance Institute for Contextual Robotic Technologies



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Destination UC San Diego



tsensorssummit.org



Contextualrobotics.ucsd.edu





UCSD invests big in robotics

By Gary Robbins8:07 p.m.Oct. 10, 2014

Qualcomm chief technology officer Matt Grob displays a tiny flying drone during Friday's future of robotics symposium at UC San Diego. His company will help UCSD expand its research in robotics. The day may be coming when a swarm of tiny flying robots will appear at your door if you dial 911 for help.

"Robots can be there in a matter of seconds and provide police with the information they need when they respond," said Vijay Kumar, a researcher who is developing such robots at the University of Pennsylvania.

He tossed out this little mind grenade on Friday at UC San Diego, where some of the nation's top scientists met to discuss the potential of robotics.

The futuristic, but not too futuristic, topics ranged from self-driving cars to drones that check moisture levels in crops to robots that help older people cook, clean and fluff the laundry.

The University of California San Diego's Jacobs School of Engineering held the public symposium as part of a formal announcement that it's investing big in robotics. Its plans include hiring five robotics professors during the next two years, plus expanding research in that field from \$800,000 to between \$6 million and \$8 million annually.



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Institute for Contextual Robotic Technologies Status Report



- ✓ Engaging 60 faculty in discussion
- Completed inventory of existing strengths
- ✓ Leadership commitment to hire 5 faculty in robotics
- First hire completed (Mike Tolley, Printable Robotics)
- ✓ Hosted International Forum featuring world's thought leaders
- ✓ Consulting with thought leaders on directions in the field
- ✓ Began process of industry input

We are eager to hear your input, and plan for two Leaders to return and tell us more.



One University: Collaboration to Enrich Relevance Institute for Global Production and Innovation



ACCESS, CONNECTION, VOICE

Global Production and Innovation Jacobs School Goals and Opportunities in CaliBaja

Why Now?

- Advanced manufacturing is a fertile field for new technology development
- Wave of federal government and industry investment in manufacturing

Why Cali-Baja/Mexico?

- Proximity to San Diego
- Positive policy reform in Mexico and desire to partner with San Diego
- Cali-Baja comprises 30% of all manufacturing in Mexico

Why UC San Diego?

- Jacobs School is largest school in CA/only research university in San Diego
- Research strengths in materials, electronics, communications, medical devices synergistic with Mexican manufacturing focus
- Strong innovation ecosystem
- IR/PS expert in macro view of regional and worldwide ecosystems



Existing Resources That Could Be Tailored to Manufacturing Ecosystem

- Relevant Faculty Research
- Project-based Internships
- Master Degree Programs
- Innovation Training Programs



NanoPrinting for Advanced Manufacturing Example of School-Wide Research Opportunities

(Bioengineering, Electrical Engineering, Computer Science, Mechanical Engineering, NanoEngineering, Structural Engineering)



Several Applications



UV Sensors





Biosensors

Organic Electronics



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The Jacobs School's Agile Center Initiative

- Agile Center: two or more faculty from various disciplines who collaborate to be *highly responsive* to industry needs for **innovation** and **talent**.
- The Dean's Initiative:
 - Research Reviews twice each year- hired events expertise
 - Student Resume Database
 - Website, Press Releases by expert Communications and Marketing staff
 - Password protected access to technical papers
- Seed Graduate Student Fellowships
- Fast-Track Agreements
- Recruit the new faculty talent with corporate collaboration
- Visiting Industry Fellows
- Corporate Affiliates Program membership



Benefits to Industry

 Joining Agile Centers provides access to UC San Diego faculty, researchers, and graduate students who are transforming their field in ways highly relevant to industry.

Key benefits:

- Access to multidisciplinary innovation via bi-annual workshops & research reviews
- Student recruiting: Access to the most promising students for:
 - Full-time employment
 - Internships
- 1:1 collaborations with faculty, researchers and graduate students
- Visiting-scholar opportunities for research staff
- Directed research projects and non-directed research gifts
- Branding for your company
- Continuing education for your employees
- Influence: shape the direction of this research through input

on research projects, faculty hiring priorities, etc.

 First access to starts ups coming out of center using our commercialization engine: von Liebig Center of Entrepreneurism

Center for Wearable Sensors

UC San Diego

Jacobs School of Engineering

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Faculty Presentation



Professor Patrick Mercier

Electrical and Computer Engineering Associate Director, Center for Wearable Sensors



CAP Business



Cody Noghera Director Corporate Affiliates Program Jacobs School of Engineering



Team Internship Program

Talented teams tackling significant projects Summer 2014 | 330 Students |82 Teams | 42 Companies



Time to start budgeting for Summer 2015 Projects! Stay ahead by submitting projects early*



Master of Advanced Study Updates



San Diego

Jacobs School of Engineering CORPORATE AFFILIATES PROGRAM A master's degree for engineering professionals

Fall 2014

- 130 Master of Advanced Study students
 - 87 new students
 - 43 returning students (2nd year)
- 4 Programs
 - Data Science and Engineering (NEW FA14)
 - Wireless Embedded Systems
 - Architecture-based Enterprise Systems Engineering
 - Medical Device Engineering
- 13 classes at Jacobs and Rady
 - Alternating Friday/Saturdays
- Integration with MS/PhD students
 - Jacobs Graduate School Council events

Stay Technical. Move Up. Invent.





Master of Advanced Study Updates

MAS Corporate Representation

*indicates student enrolled 2014-15

Abbott Vascular* Advanced Brain Monitoring* AeroAstroTech* ai-one Inc. Alcatel-Lucent* Alphatec Spine Apex Biotechnology Corp* **BAE Systems** Bank of America Home Loans* Barona Resort & Casino* **Beckman Coulter* Biopico Systems*** Boeing **Booz Allen Hamilton*** Broadcom Corp* California Correctional Health Care Callaway Golf* Carefusion* **Catheter Connections** CeolNova BioSciences* CoStar Group* Covidien Cubic Transportation Systems* Cubic* Cymer*

UC San Diego

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ED&K Engineering ntropic Communications* Fallbrook Engineering* Galaxy, Inc.* Genentech* **General Atomics*** GlySens* Harper Construction Hewlett Packard Hospira* Illumina* Innovive* Inova Diagnostics* Integrant Inc.* Intuit* Life Technologies LifeNet Health* Leidos* Lockheed Martin Makena Technologies Medtronic Ablation Frontiers* MITRE* Neustar* Nokia* Northrop Grumman* NuVasive* **Oncore Manufacturing** Optum360, a division of United Health Group*

Panasonic **Peregrine Semiconductor*** Qualcomm* Raytheon SAIC* Samsung* San Diego Supercomputer Center Sentek Global Servicios Quirugicos S.A.* SIO, UCSD* Solar Turbines SPAWAR* Survice Engineering SynteractHCR* **Tandem Diabetes** TASC* Teradata* The Boeing Company* **Thermo Fisher Scientific** TrellisWare* UCSD Medical Center **UTC** Aerospace Systems **Universal Hospital Services*** ViaSat* Volcano* Vulcan Wireless* West Arbor Group*

SENSORS SUMMIT["]FOR TRILLION SENSOR ROADMAP

Estancia La Jolla Hotel & Spa, La Jolla, CA November 12-13, 2014

CAP Members Receive \$300 Discount

Ultrahigh volume sensor applications and markets for the coming decade

BIOTECHNOLOGY | BIOINFORMATICS | MEDICINE | NANOMATERIALS | NANOTECHNOLOGY | NETWORKS | DIGITAL MANUFACTURING | INFINITE COMPUTING | COMPUTATIONAL SYSTEMS | ARTIFICIAL INTELLIGENCE | ROBOTICS



CORPORATE AFFILIATES PROGRAM

www.tsensorssummit.org

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Corporate Affiliates Program Welcomes Research Expo Sponsorships



600+ Graduate Students, Faculty, Alumni, VC's and Industry Attendees

200+ Graduate Research Posters

Faculty Innovation Talks to Feature Agile Research Centers



Jacobs School of Engineering CORPORATE AFFILIATES PROGRAM jacobsschool.ucsd.edu/re

ACCESS, CONNECTION, VOICE



- Largest student-run job fair on the West Coast
- Friday, February 20, 2015 9:30 AM to 2:00 AM in Price Center Ballrooms
 86 Companies and over 1800 personnel in attendance in past DECaF
- Fantastic way to connect with UCSD talent!
- Multiple package levels to suit company needs
- Registration now open at: <u>tesc.ucsd.edu/decaf/recruiters</u>





going to town...!

Launch San Diego's 1st Premier Hackathon

- Attract multidiscipline and diverse talent and attention to our region
- Showcase student innovation
- Companies and students alike diving into the creative solutions to modern problems
- Corporate challenges and judging
- Expecting over 1000+ attendees
- Many different packages to suit company needs

Contact: Ryan Hill - <u>ryanjohill@gmail.com</u>



UC San Diego Bioengineering Students win National Academy of Engineering 'Peoples Choice' award



"The Future is Boundless"

UC San Diego Bioengineering Students win National Academy of Engineering 'Peoples Choice' award



"The Future is Boundless"

CAP Business:



Dates to Remember:

Wed-Thu, November 12-13, 2014 Trillion Sensors Summit – San Diego

Thur-Fri, November 20-21

Thursday, February 5, 2015

Friday, February 20, 2015

Thursday, April 16, 2015

Thursday, June 11, 2015

Thursday, October 1, 2015

Center for Wireless Communications 5G Forum

CAP Executive Board Meeting

Disciplines of Engineering Career Fair (DECaF) Jacobs School Research Expo

CAP Executive Board Meeting

CAP Executive Board Meeting



UC San Diego Jacobs School of Engineering

Welcome CAP Executive Board