

UC San Diego

JACOBS SCHOOL OF ENGINEERING
Corporate Affiliates Program



Welcome
CAP Executive Board
February 13, 2020

CAP Chairman and Vice Chairman



GB Singh

Director, Package & Systems Engineering
Solar Turbines



John Black

Senior Vice President, New Product Development
Brain Corporation

Welcome

UC San Diego

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Corporate Affiliates Program

Welcome New CAP Executive Board Vice Chairman



John Black

Senior Vice President
New Product Development
Brain Corporation

- Over 25 years of experience in engineering and product management
- Moved to San Diego from Minnesota to join Brain Corporation in 2015
- CAP Executive for Brain Corporation since 2018
- Executive focal for Team Internship Program (TIP), Cooperative Education (Co-op) Program, and Contextual Robotics Institute

Welcome New CAP Partners



L3HARRIS™
FAST. FORWARD.

Viasat Satellite Engineering Co-op Experience

February 13, 2020

Tina Kafel



Overview

- About Me
- About Viasat
- About Viasat SCC
- Projects
- Learning Experiences



About Me



My name is Tina Kafel



I am a Transfer Student from Glendale, CA



My Major is Electrical Engineering



My area of study is Computer Systems



Additional areas of Interest: Cyber Security, Data Analysis, Big Data, network security

About Viasat

- A communication company
- Headquarters in Carlsbad, CA
- CEO: Mark Dankberg
- Provides high speed broadband services for commercial and military markets





About SCC

- Satellite Control Center
- Established in 2017
- The goal is to conduct Satellite operations independently and protect intellectual property
- The center monitors the satellite 24/7
- Conducts Satellite operations to maintain the health of the Satellite

Projects

- Project1
 - Onboarding
- Project2
 - Working with Servers to extract data for further analysis
- Project3
 - Satellite maneuver reporter
- Project4
 - Database for various FDS procedures and reports
- Project5
 - An application to gather TLM data Analysis
- Project6
 - Working with Air Force databases and APIs for tracking down important information regarding our Satellite



Project 1



- About a month of training
- Satellite Subsystems
- Terminology
- Satellite Operations
- Network infrastructure
- Agile project management; Jira, confluence, GitHub
- Company culture



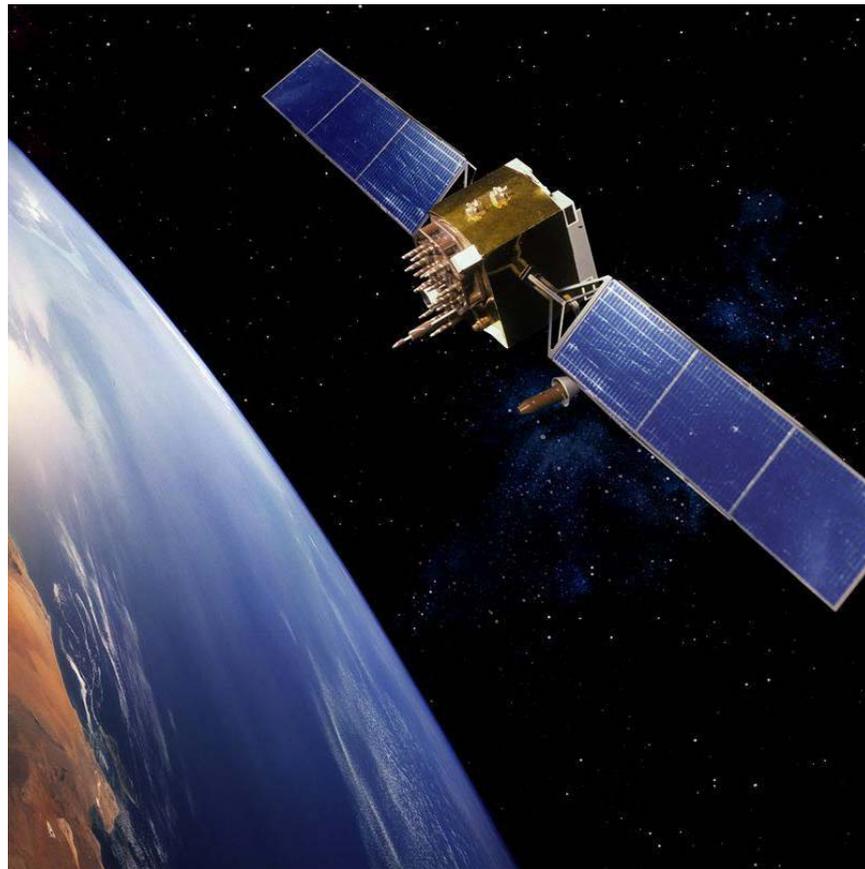
Project 2

- Studies about SCC flights network and data center
- Extract data from the servers using a TCL script
- Use python to run TCL script and store information in data frames using pandas
- Data prep and Data cleaning
- Additional Data Analysis requested by the Satellite engineers



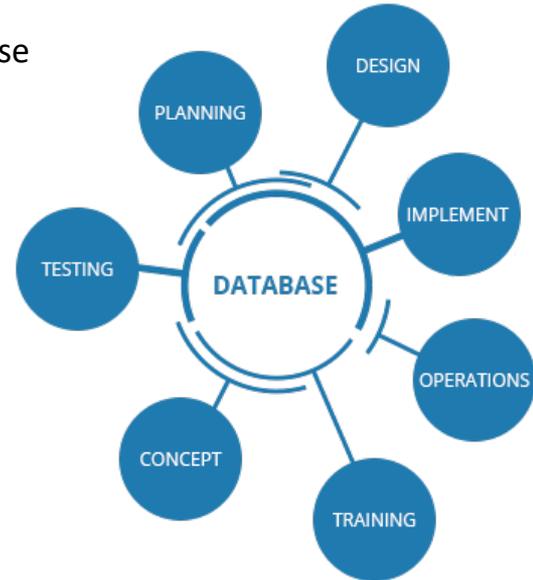
Project 3

- Learned about regular flights dynamic operation and why they are necessary
- Types of Maneuver
- Satellite thrusters
- Automate maneuver report
- Potential problems



Project 5

- Study of various databases including MySQL, MongoDB, Oracle Database
- Developed a program to extract FDS data from AF Database
- Use of RESTful APIs
- Automate the process



My Thoughts on the Co-op

- This co-op is a pilot program for the duration of 6 months
- Coop was extended for an extra quarter totaling to 9 months
- CSE classes and hands-on ECE classes were a great help for my interview
- Help in my current classes
- Industry experience is invaluable
- Viasat has amazing culture, friendly environment, and encouraging
- Great events: Halloween party, Navy Birthday celebration, Veteran's day, Thanksgiving, Christmas, CEO quarterly reports, etc.





Thank you

- Jacobs School of Engineering, Dean Pisano & Corporate Affiliates Program
- Viasat Inc.
- My fellow coworkers and engineers



Questions?

Dean's Report

Albert P. Pisano

Dean, Jacobs School of Engineering



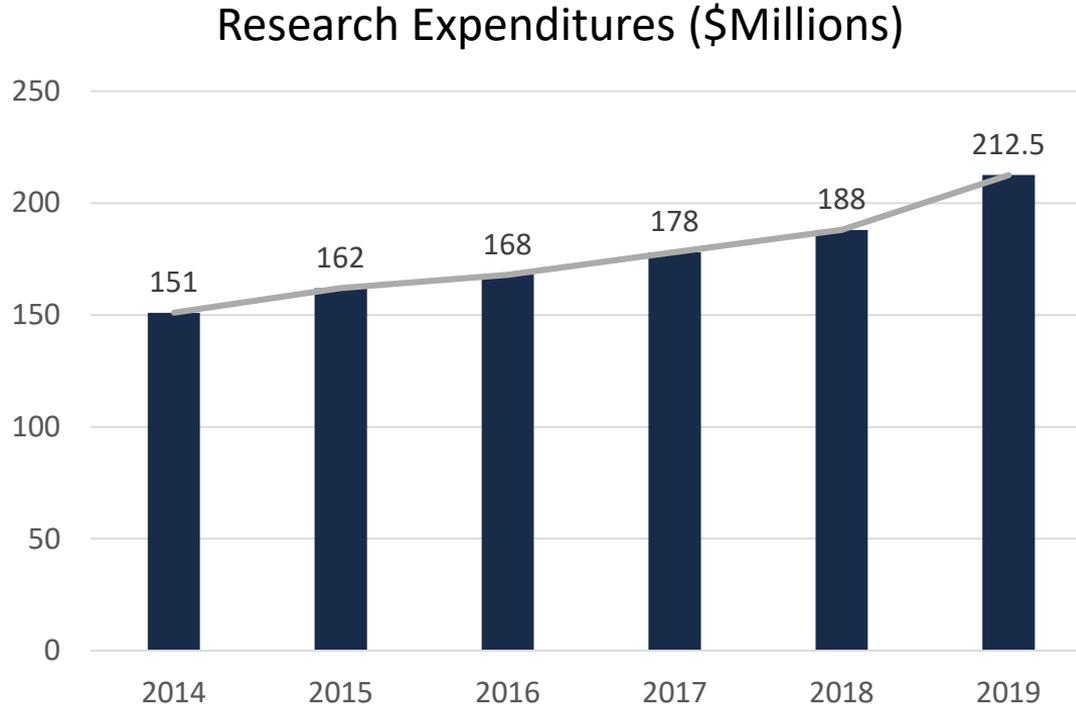
Accelerating the March to Cachet

UC San Diego

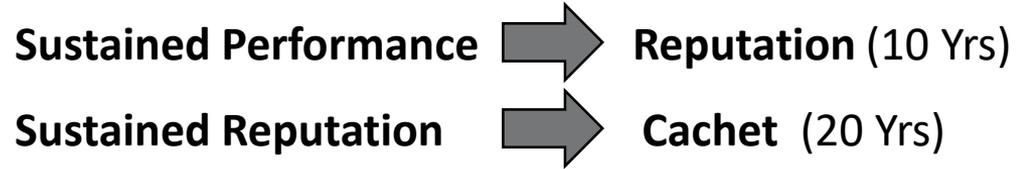
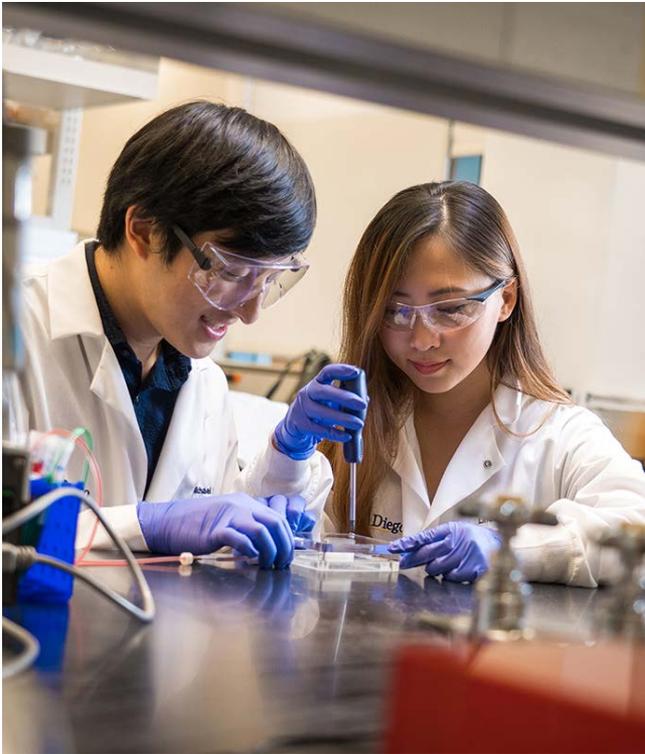
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Corporate Affiliates Program

Record-breaking Research Expenditures!

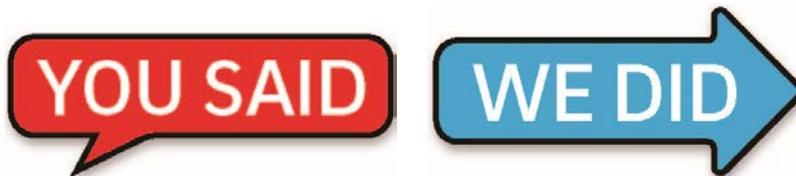
\$212.5M research expenditures in 2019 (\$63M private)



The Jacobs School of the next Decade: from Reputation to Cachet



- Spent the last 10 years growing in size and building our reputation as an engineering institution
- Drive towards relevance and cachet, not measured solely by ranking.
- Known for the company we keep, projects we create, and impact we have



YOU SAID	WE DID
Three month internships are too short	Launched a 6-month Co-op pilot program
Industry needs a new generation of systems thinkers	SYSE White Paper, reviewed current curriculum, launched first courses, hired faculty director
Need innovations in materials for healthcare and energy solutions	Launched Center for Nano Immuno-Engineering and Institute for Materials Discovery & Design
AI must be taught across disciplines at undergraduate level	Created cross-disciplinary faculty committee with goal to infuse AI into curriculum

Jon Wade to lead Convergent Systems Engineering Program



- Most recently a research professor in the School of Systems and Enterprises at the Stevens Institute of Technology, Director of the Systems and Software Engineering Division, CTO of the Systems Engineering Research Center (SERC), DoD University Affiliated Research Center
- Elected as INCOSE Fellow in 2018 and serves associate director for academic research. Co-author of INCOSE SE Vision 2025 white paper
- Former executive at International Game Technology (IGT), Sun Microsystems and Thinking Machines Corporation
- First of a cluster hire of faculty

AI Tools for Engineering Practice

- AI techniques are increasingly used for new engineering applications
- Faculty committee reviewing curriculum of all six engineering departments to include AI principles/applications
- New courses are being created to expand on existing AI curriculum in each department
- Planned launch of new courses in 2020-2021 Academic Year





Strategic University-Industry Relationships

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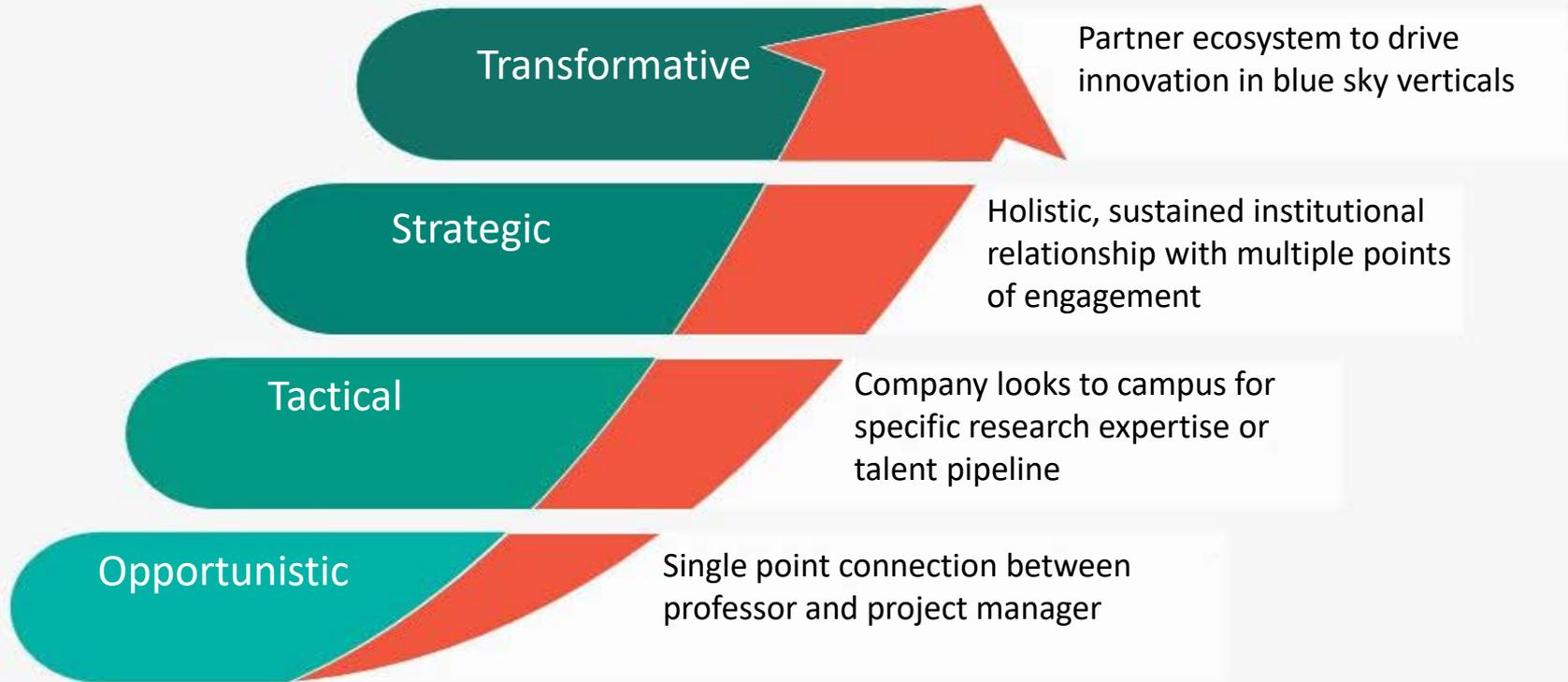
A Single Point Connection with an Expert Faculty Member is Necessary, but not Sufficient

*“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

Drive Relevancy and Ensure Exponential Impact



Strategic Relationship Characteristics

- Clear sense of mutual benefit to both Jacobs School and partner
- Holistic and coordinated institutional approach to engaging multiple corporate divisions to reach goals
- Sustained, multi-year engagement with branded corporate presence on campus

Many thanks to our new Franklin Antonio Hall strategic partners!



Roundtable Discussion Topic

Discussion: What initiatives, rooted in our departments, can we set-up in order to drive value across the entire Jacobs School of Engineering?

Previous examples:

- Convergent Systems Engineering
- AI Tools for Engineering Practice
- What's next?

Faculty Presentation



Kun Zhang

Professor & Chair, Bioengineering

State of the Department:
Bioengineering

Overview of Bioengineering

Kun Zhang

Frontiers of BE/BME

1966

AEROSPACE AND MECHANICAL ENGINEERING SCIENCES

(INCLUDING BIOENGINEERING)

Departmental Office, 5202 Urey Hall

Instructional Staff

Y. C. Fung, Ph.D., *Professor of Bioengineering and Applied Mechanics*

B. W. Zweifach, Ph.D., *Professor of Bioengineering*

Fung/Zweifach/Intaglietta

1988: Shu Chien

Biomechanics

Tissue Engineering ... Regenerative Medicine

Systems Biology ... Genomics

Synthetic Biology

Human/machine interface

Multi-scale imaging

Genome editing

Microbiome

AI/Data science

UCSD Bioengineering (2019)



33 Core Faculty
28 Affiliate Faculty
4 Adjunct Faculty

14 Research/Project Scientists
42 Postdoctoral Fellows
20 Research Associates

32 Staffs

135 Ph.D. Students
66 M.S. Students
8 M. Eng. Students
579 Undergraduate Students in 4
Majors (3 ABET accredited)

Our star faculty



YC Fung, Shu Chien

- Members of all three national academies
- Recipients of National Medal of Science



New recruits in 2017

2019



Lingyan Shi



Ben Smarr

National ranking

- National Research Council (evidence based, 2010)
 - S-Rank (Scholarship): #1
 - Research: #2
 - R-Rank (faculty peer assessment): #1
- US News (Dept. chair peer assessment)
 - #5 (#2-5 in the past two decades)

BE faculty brings the campus together

- **Joint appointment:**

- with SOM: Ludmil Alexandrov (CMM); Shu Chien (Medicine); Kevin King (Medicine); Andrew McCulloch (Medicine); Rob Knight (Pediatrics); Elliot McViegh (Radiology); Bernhard Palsson (Pediatrics); Ben Smarr (HDSI)
- with Biology: Jeff Hasty
- with MAE: Ratneshwar Lal

- **Operates outside of JSOE:** Elliot McViegh (CTRI); Francisco Contijoch (CTRI); Ludmil Alexandrov (CMM-E); Kevin King(Leichtag); Karen Christman (SCRM); Adam Engler (SCRM); Ester Kwon (SCRM); Bernhard Palsson (BRF II); Rob Knight (BRF II); Jeff Hasty (Urey)

Our trainees



Ann Lee Karlon
(Genentech SVP)



Tom Skalak
Tsai Foundation



Raj Krishnan & Erik Engelson
(Entrepreneurs)



Makoto Suematsu
(AMED President, Japan's NIH)



Brian Clary
UCSD Dept Surgery Chair



Christophe Schilling
Genomica CEO
Biocom, Board Chair

Commercialization efforts by BE faculty/trainees

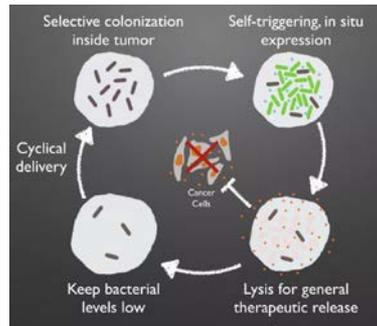
Sangart	Biological Dynamics	Neuroverse
Glysens	NanoCollect	Arytha
Genomatica	Ventrix	Sonrgy
InSilicomed	Cognionics	Singlera
TearLab	Nanovision	Genemo
InflammaGen	DevaCell	GenCirq



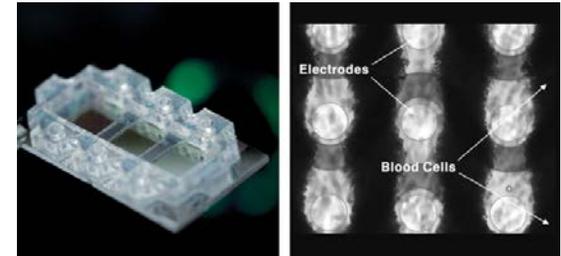
Bio-based production of 1,4-butanediol



Continuous glucose monitoring



Tumor killing bacteria



Lab-on-chip for blood tests

BE Board of Trustee

- Long-term education objectives
- Fund raising



Walt Baxter, PhD
Senior Principal Scientist
Medtronic Neuromodulation



Ann Lee-Karlon
Senior Vice President, Genentech



Joseph Y. Lucisano, PhD
President, Lucisano Consulting



Erik T. Engelson, MS
President & CEO of Lucira Health, Inc



Paul Citron, MSEE, Ph.D. (hon.)
Retired, ex-SVP, Medtronic

Thank you! Questions?

Faculty Presentation



Dean Tullsen

Professor & Chair, Computer Science & Engineering

State of the Department: Computer
Science & Engineering



Computer Science and Engineering Department

Dean Tullsen, Chair



CSE

Our numbers:

67 Faculty

~1900 Undergraduate Students

~520 MS Students

~250 PhD Students

2011 Snapshot

~45 Faculty

~1200 UG

~125 MS

~150 PhD



CSE

Three Majors:

Computer Science

Computer Engineering

Bioinformatics



CSE Rankings

USNWR

CS #16

CE #12

ARWR (Shanghai)

#14

CSRankings.org

#9



Our Graduates

Undergraduates are in great demand locally and across the US, etc. Many end up in Silicon Valley. Many go on to graduate school.

MS students distributed similarly, many go on to PhD, about 15/year stay here for PhD.

PhD students most typically go to top industry research labs, but every year we place several at top-ranked Research Universities as faculty.



Highly Recognized Faculty

12 ACM Fellows

9 IEEE Fellows

28 NSF Career Awards

12 Sloan Fellows

25 major awards in the last year or so

Algorithms and Complexity



Russell Impagliazzo



Shachar Lovett



Mohan Paturi



Daniel Kane

Artificial Intelligence



Julian McAuley



Jingbo Shang



Yoav Freund



Gary Cottrell



Taylor Berg-Kirkpatrick



Ndadapula Nakashole



Kamalika Chaudhuri



Lawrence Saul



Sanjoy Dasgupta

Bioinformatics and Computational Medicine



Nuno Bandeira



Debashis Sahoo



Vineet Bafna



Melissa Gymrek



Pavel Pevzner



Rob Knight

Computer Architecture



Hadi Esmaeilzadeh



Jishen Zhao



Steve Swanson



Dean Tullsen

Cryptography and Security



Mihir Bellare



Nadia Heninger



Daniele Micciancio



Stefan Savage

Databases and Data Science



Yannis Papakonstantinou



Alin Deutsch



Arun Kumar



Victor Vianu

Embedded Systems and VLSI



Tajana Rosing



Rajesh Gupta



Alex Orailoglu



Sicun Gao



CK Cheng



Aaron Schulman



Andrew Kahng



Ryan Kastner

Programming Languages



Deian Stefan



Nadia Polikarpova



Ranjit Jhala



Sorin Lerner

Robotics



Laurel Riek



Henrik Christensen

Software Engineering and Human-Computer Interaction



Bill Griswold



Scott Klemmer



Larry Smarr



Nadir Weibel

Systems and Networking



George Porter



Joe Pasquale



Geoff Voelker



Yuanyuan Zhou



Yiying Zhang



Pat Pannuto



Alex Snoeren

Teaching Faculty



Mia Minnes Kemp



Niema Moshiri



Christine Alvarado



Gerald Raj



Joe Politz



Leo Porter

Vision and Graphics



Ravi Ramamoorthi



Albert Chern



Manmohan Chandraker



Hao Su



David Kriegman

Faculty Hiring 2020

Focus Areas

- Reinforcement Learning/Trustworthy AI
- Software Engineering
- Quantum Computing
- HCI
- Security

Undergraduate Curriculum (BS in CS)

Lower Division

- Programming, Data Structures, Discrete Math, Computer Organization

Required Upper Division

- Data Structures, Algorithms, Software Engineering, Architecture, Systems, PL or DB, Security/Cryptography, ML or vision/graphics

Upper Division Electives

- All specializations listed on prior slides, more

Questions for me?

Questions for you

1. What are the skills you would most like to see in CSE graduates that come into your company?
2. In what technical areas would you like to see the CSE department grow/expand?

CAP Business



Wil Dyer

Director, Corporate Affiliates Program

CAP News & Updates

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Corporate Affiliates Program

Jacobs School Corporate Affiliates Program



Talent Programs

Recruiting Timeline	
OCT - DEC	Companies define and submit projects and recruitment starts; offers extended
JAN - MAR	Companies continue to submit their projects and recruitment continues; offers extended
APR	Finalize recruitment & offers. Strategy calls for next year start
MAY	Internship selections completed Intern pre-deployment training
JUN - DEC	TIP/Regular Internships period during 10-12 consecutive weeks (Jun-Sept) Co-op period up to 6 months (Jun-Dec)

WHAT WE DO FOR YOU:

- **Talent Acquisition strategy:**
 - **Brand** development
 - **Streamlining** recruiting
 - **Talent Programs** (TIP and Co-op, on campus projects)



WHAT COMPANIES RECEIVE:

- **Brand** recognition; **Access**
- Greater ROI; **Reduced cost** per hire
- **Event at Fall CAP board meeting**

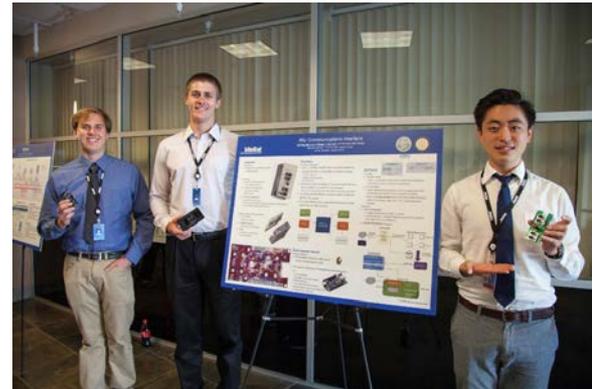
Team Internship Program (TIP)

Jacobs School Student Teams:

- 2-5 members
- Undergraduate, Masters, and Ph.D. Levels
- All engineering majors - we encourage multi-disciplinary teams
- May include other majors on occasion –e.g. one business student

Internship Details:

- Paid Internships
- 10-12 weeks over the summer
- Full-time, i.e., 40 hour/week commitment



Cooperative Education (Co-op)

- ✓ **6 months** -Summer and Fall
- ✓ **Full-time** (30-40 hours per week)
- ✓ **Ugrads:** CSE and ECE
- ✓ **Ugrads and MS:** MAE, NENG, SENG
- ✓ **First** in the UC System
- ✓ Pilot run July-December 2019; **next edition starts July 2020**
- ✓ Over 450 student applicants in 2019, **22 hired, 50/50 Int. VS Dom.**

2019 Participating Partners



TALENT PROGRAMS POLL

IF you usually target PhD students:

CAP – PhD students Mentor Program?

Your engineering leaders partnered with our PhDs for a monthly mentorship session + one annual event at Jacobs

Strategic goal: Build your PhD pipeline



Center for Extreme Events Research Summit
March 12, 2020

*Data-driven Computational and Experimental Techniques
for Extreme Events Applications*

CEER.ucsd.edu

RESEARCH EXPO 2020

THURSDAY, APRIL 16 AT UC SAN DIEGO | JACOBSCHOOL.UCSD.EDU/RE

RESEARCH EXPO 2020
THURSDAY, APRIL 16 - 1:30-6:00PM - UC SAN DIEGO

Come to Research Expo 2020 and experience leading-edge engineering and computer science research. Talk tech with graduate students.

200+ GRAD STUDENT POSTERS

2:00 - 4:30PM

Meet graduate students who match your company's technology roadmaps and workforce needs.

FACULTY TALKS

3:00 - 4:30PM

Twenty-minute faculty talks. Get industry-relevant research highlights from world-renowned Jacobs School faculty.

RECRUITMENT HOUR

3:30 - 4:30PM

Recruit students, talk research, and enjoy refreshments.

NETWORKING RECEPTION

4:30 - 6:00PM

Connect with engineering faculty, students and alumni. Meet a broad spectrum of industry professionals. Best poster awards.



JacobsSchool.ucsd.edu/re

REGISTER

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brain corp

UCSanDiego | EXTENSION

Call for:

1. Distinguished CAP Executive Judges
2. CAP Partner University Relations/Recruiters
3. CAP Partner Sponsorships

JacobsSchool.ucsd.edu/re

Action Items

- ✓ Write down your input on the back of the agenda and leave on table so we can collect
- ✓ Contact Rocio de Lis (mdelis@eng.ucsd.edu) for TIP/Co-op 2020 participation
- ✓ Send CAP Executive judges and recruiters to Research Expo (jacobsschool.ucsd.edu/re)

All Upcoming Events

March 12, 2020	Center for Extreme Events Research Summit
April 16, 2020	Jacobs School Research Expo
May 12, 2020	Gordon Center Engineering Leadership Awards Gala
May 28-29, 2020	Center for Visual Computing Retreat
June 4, 2020	Spring CAP Executive Board Meeting

UC San Diego

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Thank you!
Next Board Meeting:
June 4, 2020