UC San Diego
JACOBS SCHOOL OF ENGINEERING
Corporate Affiliates Program

Welcome
CAP Executive Board
October 3, 2024

CAP Chair and Vice Chair

Magaly Drant

Vice President, Developer Productivity
ServiceNow

Shariqa Dowla

Director, Software Engineering
Cubic Transportation Systems

Welcome

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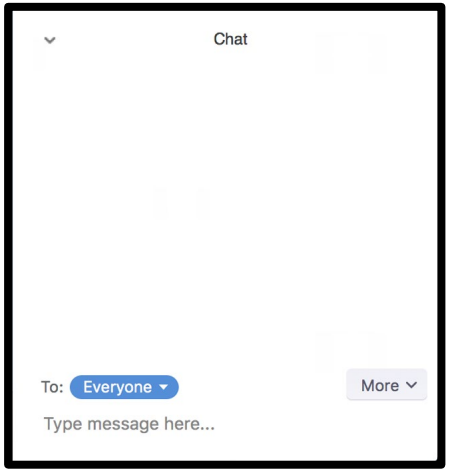
Virtual Attendee Protocol

➔ We will be recording this meeting

➔ You will be muted; Use chat box for questions & comments

➔ We will create a Zoom room for the discussion portion of the meeting, please turn on your cameras at that time.



Agenda

UC San Diego
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5:00-5:05pm	CAP Executive Board Chairwoman Welcome
5:05-5:15pm	Team Internship Program (TIP) Presentation
5:15-5:30pm	Dean's Report
5:30-5:40pm	Laboratory for Emerging Intelligence
5:40-5:45pm	Artificial Intelligence Initiatives
5:45-6:05pm	Artificial Intelligence Panel
6:05-6:25pm	CAP Executive Input
6:25-6:30pm	CAP Business
6:30pm	Adjournment

Welcome New CAP Partners

SAILPLANE.AI

Welcome Guests

BOOZ ALLEN HAMILTON
GENENTECH
ILLUMINA
MEGGITT
SDG&E
SAAB
VENTANA

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CAP Partner Milestones

20+ years

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CAP Partner Milestones

15 years

10 years

ThermoFisher
SCIENTIFIC

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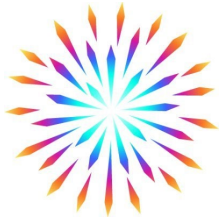
CAP Partner Milestones

5 years



Welcome Brain Corp TIP Team

Mission-Based Autonomy

By: Mohak Vaswani and David Wang

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Introduction

David Wang
Cloud Team

Mohak Vaswani
Robot Application Team

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What is Mission Based Autonomy (MBA)?

MBA enables:

- Moving away from the traditional teach and repeat
- Scheduled and AdHoc missions
- GoTo (home, point-of-interest, poses)
- Spot-Clean
- Docking / Undocking
- Re-clean/re-scan skipped areas
- Enhanced Reporting (grouping routes into missions)
- *…and more!*

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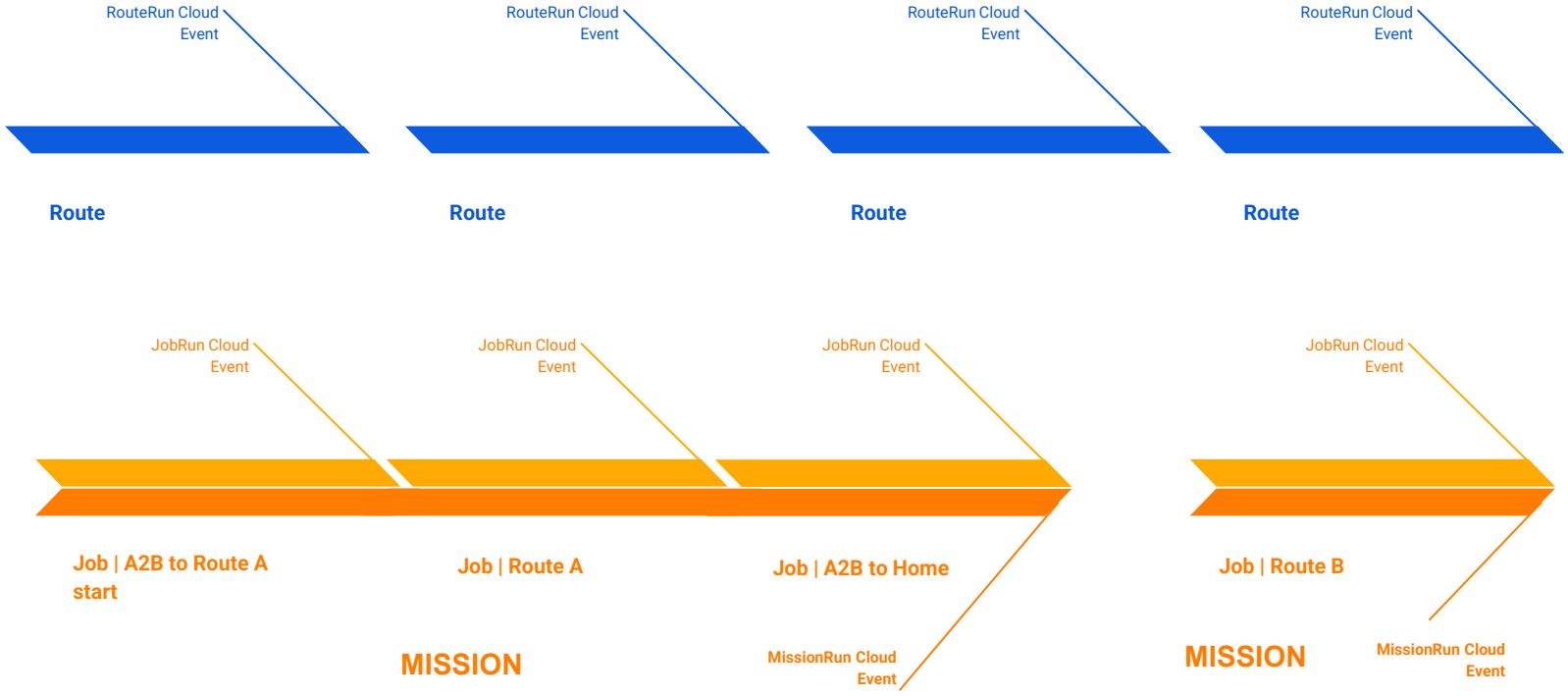
Mission Based: Old vs New



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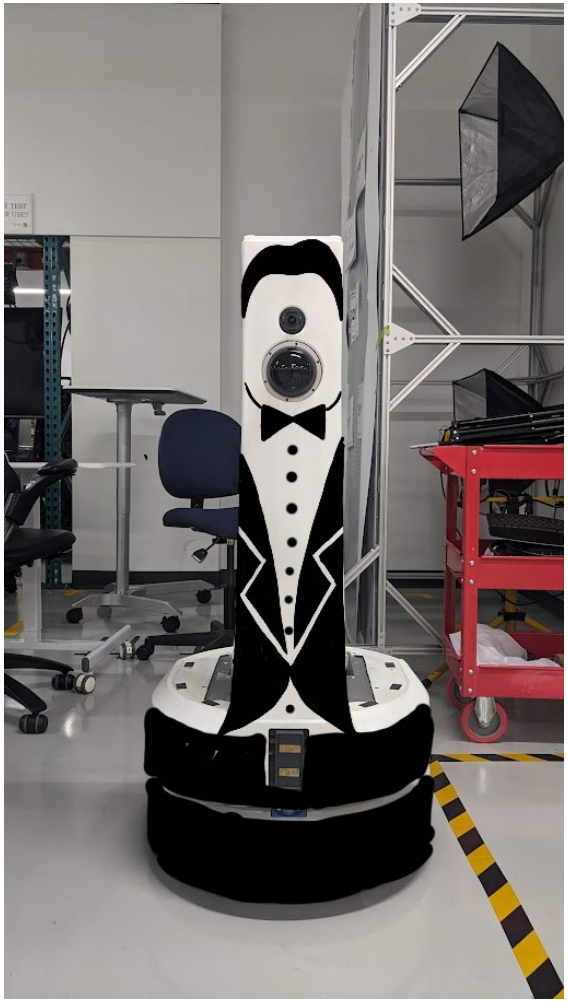
Introducing: Snackbot (Botler)

- MBA Proof of Concept
- A2B and route run capabilities
- Can hold snacks
- Joint project between the Cloud Team and the Apps team



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One sec, I’m thirsty

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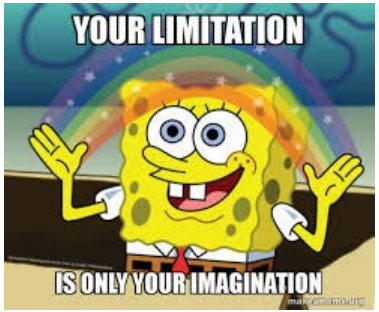
Limitations and Future improvements

- Can’t schedule mission
  - ex: I want Doritos at 2 pm
- Multiple requests sent get treated as a single mission, causing reporting issues on the cloud side
- A Wait Job that waits until a command is passed to resume the robot



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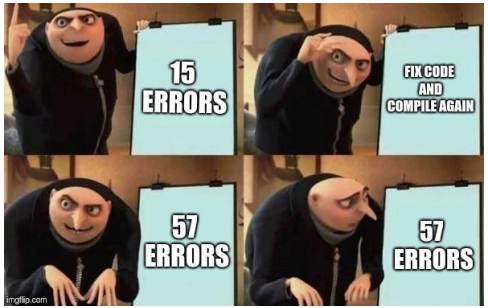
What we learned

Technical Stuff

- Cloud architecture
  - GCP, Firestore, BigQuery
- Robot's application layer architecture
  - Events, commands, ticks, workflows, state machines
  - Real-life use of what we learned in School
- There are more edge cases than meets the eye
- Change anything, change everything
- Usage of different tools that can help you formulate ideas and see them to completion
  - Mind Maps and Flowcharts

Life Stuff

- Plan things out, but don't get too attached
- Cross-collaboration
- Day-to-day progress is variable
  - long-term outlook is what matters most
- Ask questions
  - all of them



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Acknowledgement

A huge thank you to:

- Brain Corporation
- Our Mentors, Nick Tripp and Tony Kinsley
- Mission Based Autonomy Team
- To everyone who helped make this project possible
- UC San Diego Jacobs School of Engineering
- Corporate Affiliates Program (CAP)

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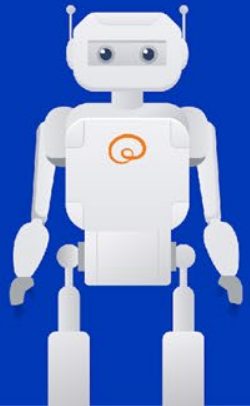
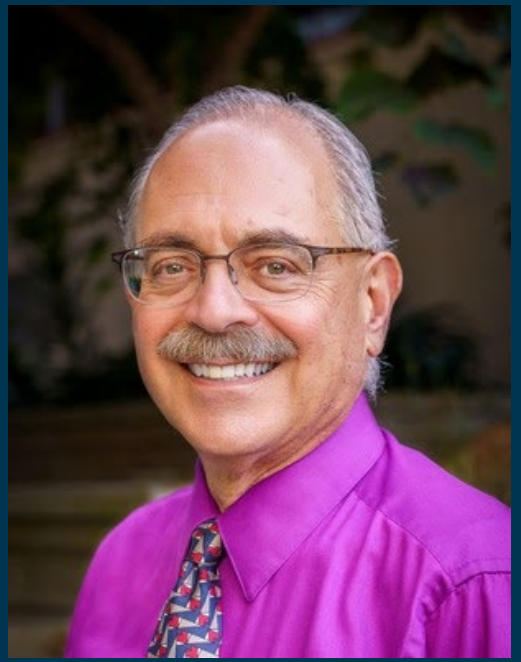
Thank you!

Questions?



2024

Dean’s Report



Albert P. Pisano

Dean, Jacobs School of Engineering
Special Adviser to the Chancellor

Arrived and Rising

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AGENDA

1. Great news
2. Updates on campus-wide initiatives
3. Artificial Intelligence efforts

Rising up the Rankings…Again!

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#11 Engineering School, #7 Public, and **#1 Public Engineering School for Academic Paper Citations**

Top Ten Rankings

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Bioengineering
#3 public
#8 in the nation

Computer Science, Systems
#5 public
#8 in the nation

Computer Science, Artificial Intelligence
#6 public
#10 in the nation

Research Funding is up…Again!

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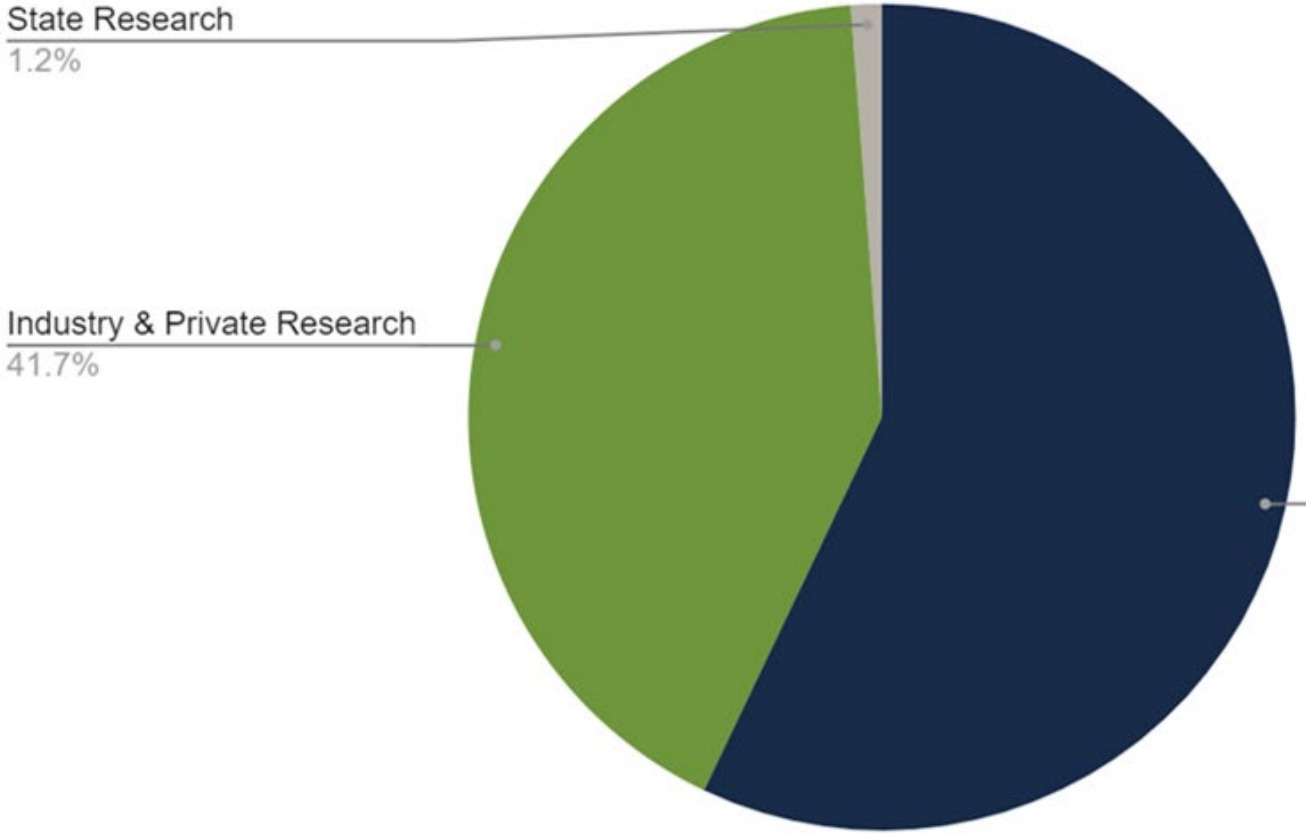

$256M research expenditures - up nearly **5%**; ranked **#2** on the West Coast, **#3** Public Engineering School in the Nation.

18 New Endowed Chairs!!!

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Top to bottom, left to right: David Fenning, Tara Javidi, Ping Liu, Sonia Martinez-Diaz, Jan Kleissl, Olivia Graeve, Jeff Hasty, Andrea Tao, Ryan Kastner, Pedro Cabrales, Farinaz Koushanfar, Alex Snoeren, Adam Engler, Laurel Reik

- Endowed Chairs play a critical role in attracting and retaining top minds in academia
- Provides game-changing annual funding to support new cross-disciplinary research collaborations
- The Jacobs School now has a total of 68 endowed chair professorships
- Made possible by the visionary support of Joan and Irwin Jacobs

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New $3M Gift to Franklin Antonio Hall

$3M gift to name the by the Gift from Aiiso Yufeng Li (Jeff) and Doreen Li to name space on the first floor of Franklin Antonio Hall that is currently occupied by the Institute for the Global Entrepreneur.

New Faculty Leadership Appointments

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Andrea Tao
Associate Dean for Students
Professor, Chemical & Nano Engineering

Pamela Cosman
Department Chair for Electrical & Computer Engineering

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Welcome 11 New Faculty

Approaching 300 total faculty; 175 in the last 11 years

New School at UC San Diego

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School of Computing, Information and Data Sciences (SCIDS)

The School of Computing, Information, and Data Sciences (SCIDS) is a new school formed by the merger of two major entities on campus: the San Diego Supercomputer Center (SDSC) and the Halıcıoğlu Data Science Institute (HDSI)

The two main components of SCIDS are the San Diego Supercomputer Center (SDSC) and Data Science (HDSI), which are two of the biggest "engineering adjacent" entities on campus

The Interim Dean of SCIDS is Rajesh Gupta, who is also the Director of HDSI and a faculty member in the Computer Science department at the Jacobs School

Last CAP Board Meeting: 5 Major Initiatives

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1. The Institute for Healthcare Engineering
2. Carbon-negative Biomanufacturing
3. Fusion Engineering Institute Launches 8 October 2024
4. **TODAY: Artificial Intelligence**
    - **Laboratory for Emerging Intelligence**
    - **AI Major & AI Tutor**
    - **National AI Perspective**
5. Heterogeneous Integration of Semiconductors

Thank you

Now, on to Artificial Intelligence

Faculty Presentation

Mohan Paturi

Professor, Computer Science & Engineering
Director, Laboratory for Emerging Intelligence

Laboratory for Emerging Intelligence

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CSE UCSD

Laboratory for Emerging Intelligence (LEI)

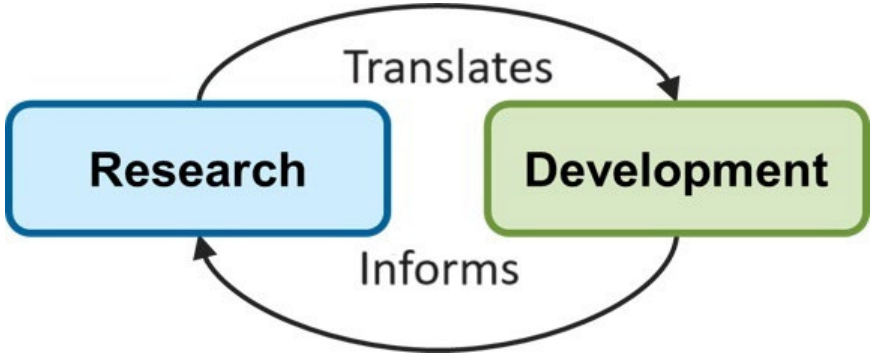
A UC San Diego laboratory for advancing AI technologies
Director: Mohan Paturi
Associate Director: Leon Bergen

QUALCOMM INSTITUTE

UC San Diego
SCHOOL OF SOCIAL SCIENCES

What is LEI?

Research and Development
together in the University



What is LEI?

A laboratory for

- Developing and deploying next-generation AI systems to advance critical applications in science, medicine, business and education
- Accelerating impactful research in AI theory and practice
- Promoting student-led innovation and facilitating commercialization

LEI People

Faculty

Taylor Berg-Kirkpatrick(CSE)

Leon Bergen(Linguistics/CSE)
Associate Director

Carlos Jensen(CSE)
Associate Vice-Chancellor

Sorin Lerner(CSE)

Elizabeth Lyons(School of Global Policy and Strategy)

Julian McAuley(CSE)

Nikhil Murthy(Neurological Surgery)

Ndapa Nakashole(CSE)

Mohan Paturi(CSE)
Director

Lianhui Qin(CSE)

Jingbo Shang(CSE)

Rose Yu(CSE)

PhD Students

Annapurna Vadapurty(Cognitive Science)

Andre (Jiangou) Wang(CSE)

Xingyuan Zhao(Linguistics)

MS Students

Longtian Bao(CSE)

Weili Cao(CSE)

Smruthi Gowtham(CSE)

Dongming Li(CSE)

Prudhviraj Naidu(CSE)

Gil Pasternak(CSE)

BS Students

Joseb Au(Cognitive Science)

Ashish Dalvi(Biology)

Zixian Wang(CSE)

Hanyen Zheng(MDS)

Qirui Zheng(MDS)

Former Students

Praveen Kumar Kenneth(Goldman Sachs)

Kaicheng Wang(USC CS PhD)

Xueyue Wang(Stanford MSCS)

Evelyn Yee(Stanford MSCS)

Why LEI?

- A best way to advance AI is by building applications/products
- University is the home for facilities, use cases, talent, ideas, and tech
- University provides deployment and testing opportunities
- University is a great platform for partnership with industry

Why UC San Diego?

- Top-rated Computer Science department and School of Engineering
- First-rate AI Scientists/Engineers
- Top-notch AI faculty (particularly in LLMs)
- World-class students at all levels
- UC San Diego as a customer innovator
- LEI an innovative organization operating at the nexus of R&D

LEI Current Projects

SmartLearning Hub

- To revolutionize education at all levels through rich, interactive and personalized tutors orchestrated by instructors
- Distillation techniques with applications to RAG

Lab and Experiment Data Intelligence

- To achieve marketplace efficiencies in procuring lab materials, supplies & equipment
- More generally, supply-chain intelligence through AI

Lab Copilot

- A system for conducting lab science efficiently from conception to completion
- Hypothesis and Evidence Extraction:
  - Extract evidence from a scientific publication for a given hypothesis
  - Create a map of scientific developments for a given topic
  - Identify relevant medical best practices based on a patient record

Thank you

Faculty Presentation

Sorin Lerner

Professor & Chair, Computer Science & Engineering

Artificial Intelligence Initiatives

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AI Major

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- Bachelor's of Science in Artificial Intelligence
- Launching Fall 2025
- Focus on Fundamentals and Applications of AI

AI Tutor

- Started with Nanoengineering (NANO 11) course; provides tailored, in-context support to students during reading assignments and while working through problem examples
- Early feedback: Students love it!
- Building human-human interaction into the learning process in new ways
- Now expanding to other departments and courses

AI Panel

Moderator:

Sorin Lerner, Professor & Chair, Computer Science & Engineering

Panelists:

Farinaz Koushanfar - Professor, Electrical & Computer Engineering

Ganapathy Krishnan - Vice President & Science Fellow, ServiceNow

Jarad Cannon - Chief Technology Officer, Brain Corporation

Mohan Paturi - Professor, Computer Science & Engineering

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CAP Executive Board Input:
AI Initiatives at the Jacobs School of Engineering

- What messages from the AI panel would you amplify?
- Would you like to help define a set of industry relevant projects for collaboration with the Lab for Emerging Intelligence?
- Other considerations for the Jacobs School to get ahead of the AI curve as research, curriculum, and administration are all disrupted by AI?

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CAP Business

Wil Dyer

Director, Corporate Affiliates Program

UC San Diego
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CAP Updates

Jacobs School Corporate Affiliates Program

UC San Diego

Thank you for joining us on the CAP Executive Cruise

September 23, 2024

And special thanks to GB Singh and Solar Turbines for hosting us aboard the Spirit of Solar!

CAP Talent Programs: Recruiting has begun!

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Share your openings with us!

- Team Internship Project: students are asking for them!
- Cooperative Education (Co-op)
- Full-Time Openings

Contact Alice Grgas at agrgas@ucsd.edu

CAP Talent Programs: Talent Strategy Planning

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- Tailored events for your company
- Info Sessions, Tech Talks, Resume Reviews
- Site tours at your company
- Internships
- Team Internship Program (TIP)
- Cooperative Education (Co-op)

Contact Alice Grgas at agrgas@ucsd.edu; Learn more at jacobsschool.ucsd.edu/talent

New Jacobs School Job & Internship Portal

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- Post openings
- Host events
- Search resume database
- Contact us for a demo

Contact Alice Grgas at agrgas@ucsd.edu

Senior (Capstone) Design Projects

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Why Senior Design Projects?

- Team of 3-6 students
- Student skills & fresh ideas in action on your technology
- Mentor students
- IP assigned to sponsor

Department	Format	Deadline to Submit Proposal
Bioengineering	1 year project	May 1, 2025
Chemical Engineering	Winter & Spring Quarters (consecutive)	Dec 2, 2024
Electrical & Computer Engineering	Winter Quarter & Spring Quarter	Dec 2, 2024
Mechanical & Aerospace Engineering	November - March or February - June	Oct 15, 2024 (Fall/Winter) Jan 15, 2025 (Winter/Spring)
NanoEngineering	Winter & Spring Quarters (consecutive)	Jan 6, 2025

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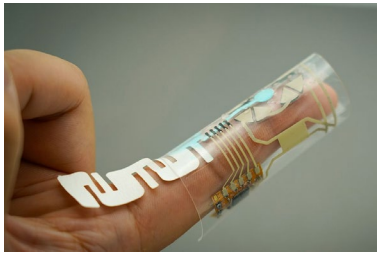
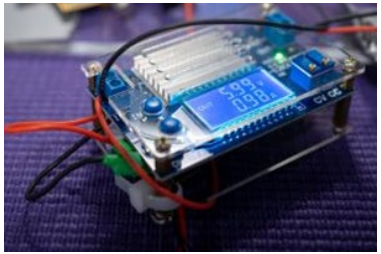
CAP Partner Invitations to Research Reviews & Symposia

The Future of Clean Energy Technology
October 16-17, 2024



Center for Wearable Sensors
November 6, 2024



Center for Wireless Communications
November 15, 2024

Fusion Energy Workshop
December 10-11, 2024

Contact: Wil Dyer, wdyer@ucsd.edu

Current Slate of Important Dates

UC San Diego
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October 9, 2024	Student-led Disciplines in Engineering Career Fair (DECaF)
October 16-17, 2024	Kyoto University + UC San Diego Future of Clean Energy Symposium
November 4, 2024	Contextual Robotics Institute “Speed Dating” Recruitment
November 6, 2024	Center for Wearable Sensors Research Summit
November 15, 2024	Center for Wireless Communications Research Review
December 9-10, 2024	Power Management Integration Center Board Meeting
December 10-11, 2024	UC Office of the President Fusion Energy Workshop
February 6, 2025	**Winter CAP Executive Board Meeting**

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Thank you!
Next CAP Executive Board Meeting:
February 6, 2025