Dean’s Report

- Good News
- Strategic Plan Update
- Today’s Topic: Institute for Global Entrepreneur
UCSD-Licensed Technology Key Feature in Programmable Robot Toy

- MiP by WowWee
  - Technology licensed from UCSD
  - “Mobile Inverted Pendulum”
  - Self-balance, drive on 2 wheels
  - Control by smart phone app

- “Product of the Future” - Popular Science, 2014 Consumer Electronics Show, Las Vegas

- On the market May 2014

UC San Diego Spin-Out GENOMATICA Wins 2014 Bloomberg New Energy Pioneer Award

- Co-founded in 2000 by Professor Bernard Palsson & Alumnus Christophe Schilling

- Headquartered in San Diego
  - 100 employees, 50% UCSD alumni

- Manufacturing process that enables partners to produce chemicals from renewable feedstocks, not petroleum

Christophe Schilling, CEO, Genomatica
Ph.D., Bioengineering, ’00
Triton Fund Open for Business

Dave Schwab, Managing Director  
Steve Hart, Investment Committee

- Dave Schwab personal investment: $2.5M
- Jacobs School investment: $1M (entire investment to Triton)
- 20% of all Vertical Venture investments targeted for Triton
- Jacobs School receives LP share and GP share from entire Vertical Venture portfolio.
- von Liebig Center mentoring for entrepreneurs emerging from UC San Diego.
M.A.S. in Data Science and Engineering
Launches Fall 2014; Applications open Mid-May

- Offered by Jacobs School Computer Science Department & San Diego Supercomputer Center
- 4th M.A.S. Program for Professional Engineers
  - Wireless Embedded Systems
  - Medical Devices
  - Architecture Based Enterprise Systems Engineering
  - Data Science & Engineering

Jacobs School 2020 Strategic Vision

- Joint Institutes
  - Education/research collaborations with campus partners
  - Faculty cluster hires build UC San Diego strength in unique strategic themes
- Agile Research Centers
  - Jacobs School faculty/industry research partnerships
  - Leverage federal investment with applied research
- Experience Engineering
  - Design-build-test project courses, beginning in freshman year
  - Inspire students and enhance career preparation

Overarching Values

- Engineering for the Global Good
- Exponential Impact through Entrepreneurism
Jacobs School 2020 Plan by the Numbers

<table>
<thead>
<tr>
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<th>2013</th>
<th>2020</th>
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<tbody>
<tr>
<td>Faculty</td>
<td>200</td>
<td>250</td>
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<tr>
<td>Undergraduates</td>
<td>6,500</td>
<td>5,000</td>
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<tr>
<td>Ugrad/Faculty</td>
<td>32:1</td>
<td>20:1</td>
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<tr>
<td>Masters &amp; Ph.D.</td>
<td>1,715</td>
<td>2,500</td>
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<tr>
<td>Graduate/Faculty</td>
<td>8.5:1</td>
<td>10:1</td>
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Progress on Structural Enablers

- **Faculty Hiring Plan (20% growth)**
  - 20 FTE Under Recruitment
  - 23 FTE Approved for Three-Year Hiring Plan
  - 7 Additional Requests Pending

- **Undergraduate Admission Control (targets based on 20:1 ratio)**
  - Control for freshman admission all majors: Fall 2014
  - Control for transfer admission all majors: Fall 2015

Under Development

- **Graduate in Four (140 eng/40 ge curricula plan)**

- **Graduate Education Financial Incentives**
  - Graduate Student Researcher Non-Resident Tuition Return to Departments
  - Master’s Degree Tuition Sharing with Division
Joint Institutes: Build on Unique Strengths with Campus Partners

Agile Research Centers
Technology Enabled. Applications Driven.

- Wearable Sensors
- Extreme Events
- Unmanned Systems
- Extreme Engineering
- Disaster Mitigating Infrastructure
- ......

Value Proposition to Companies
- Pipeline to student talent
- Access to multidisciplinary innovation
- Branding corporate commitment to the field
Center for Wearable Sensors

- **Center Goal:** Develop the world’s first “lab on the body” with continuous preventative sensing, using remote monitoring, wireless data transfer, and cloud storage and analytics to provide real time feedback.

- Converges expertise in bioengineering, biomedicine, materials, and sensors and wireless network technologies.

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Experience Engineering Initiative

**Design-Build-Test Courses, *beginning in Freshman Year***

- **Structural Engineering 120—Computer Aided Design & Manufacturing Wind Turbine Project**
  Students design, model and produce prototypes through 3D printing
  Then test performance in wind tunnel and simulated earthquake
**Maker Lab (Proposed)**

- Rapid Prototyping and Test Equipment
- Freshman and Sophomore Design-Build-Test Courses
- Student Design Competitions
- Prototype Development for Entrepreneurs

**Questions / Comments**
Institute for the Global Entrepreneur
Jacobs School of Engineering – Rady School of Management

“Develop technology leaders who can articulate the link between a technical opportunity and a resulting impact, and drive from concept to full demonstration.” Ron Reedy

Goals and Impact

- Nurture technology entrepreneurs
- Accelerate transfer of research discoveries
- Catalyze innovation with corporate partners
- Prepare students to contribute to innovation at companies large and small
Building from Experience of von Liebig Center

- 500+ technologies screened
- $6M+ in proof-of-concept grants and mentorship
- 1000+ students in graduate courses
- 41 startups launched or supported

Current Education and Practice Strategy

- **Courses**
  - Integrate business, leadership, and entrepreneurship
  - Identify candidate student entrepreneurs
  - Rapid Prototyping

- **Ideation**
  - University Research
  - Corporate Partners
  - Global Challenges
  - Imagination

- **Validation**
  - $1K-$3K demonstration grants
  - Customer development/lean start up
  - Mentors/experts
  - Moxie Internal Incubator

- **Acceleration**
  - $50K Milestone-based Proof of Concept Grants — working prototype
  - Business model — mentors — Rady Fellows
  - Introductions to external investors

- **Launch**
  - External Investment
    - Triton Fund
    - Corporate Venture
    - Federal SBIR, National I-Corps
  - External Incubators
    - EVONexus
    - CONNECT Springboard
    - Rady StartR
### Undergraduate-Current Course Offerings

**Engineering Electives**

- Product Design & Entrepreneurship (Design, Prototype, Business Plan)
- Engineering Leadership (Case studies-Product development, ethics, quality, Risk analysis, problem solving)
- Team Engineering (Design and prototype solution for Community partner-social innovation)
- Various seminars/workshops on entrepreneurship

**Rady School Business Minor**

- Principles of Accounting
- Sales and Sales Management
- Project Management
- Managing Diverse Teams
- Marketing/Product Promotion
- Global Business Strategy
- Financial Investments
- Innovation to Market
- Organizational Leadership

*Could we combine engineering practice courses with Rady business courses to create a minor geared towards engineers?*

### Graduate-Current Education Offerings

**Engineering Entrepreneurism Course Series**

*For full-time M.S. or Ph.D. students*

Four-course series focuses on the innovation & product development process within companies, business operations, and how engineering leaders at various levels contribute to success of the company.

**Rady School MBA**

*For scientists/engineers who want to pursue management career*

Includes Core Lab-to-Market Sequence on business creation

*The entrepreneurs who emerge from Jacobs School usually take the engineering entrepreneurship courses.*
Inventions Stemming from University Research

Josh Windmiller, Ph.D.
Jared Tangney, Ph.D.

Printed electrochemical biosensors

Hardware security design tool

Ideation Workshop for Cubic Transportation
Catalyzes Ideas for New Projects

Day 1
- Cubic Technology Road Map
- Inspirational talks by thought leaders (faculty, start-ups, partners)
- Practice: Ideation & Design Brainstorm Techniques

Brainstorm Breakouts
- Problem Statement
- Solution brainstorm 30+ ideas

Day 2
- Select best idea-build business case
- Select best idea-build business case
- Select best idea-build business case
- Present to Entire Group
- Group Selects Top 2 Ideas

- Top 2 ideas became internship projects for Jacobs School students.
- Cubic using techniques learned on regular basis.
Inventions Stemming from Global Social Challenges
Students inspired by opportunity to make a difference

- Two courses: 275 students per quarter
  - Team Engineering
  - Team Engineering Lab
- 32% women
- 11 long-term local and international projects for non-profit clients
- Student teams build and deploy prototype

Philippines Project
Students designed, constructed, and installed a solar-powered streetlamp for Gawad Kalinga’s Center of Social Innovation in rural Philippines. Working on 2nd prototype with improved efficiency and robustness.

Engineering Student Organizations Pursue Local and Global Social Innovation Projects

- Engineers for a Sustainable World – 50 members
  Local-Reconfigure hybrid car batteries for campus energy storage
  Global-Thailand water project for irrigation and purification
- Engineering World Health – 20 members
  Global-Point of Care Solution to screen HIV patients for ART drug resistance
- Engineers without Borders – 30 members
  Local-Smart Garden irrigation system
  Global-Rwanda-Rainwater harvesting system for drinking water
Jacobs School & NSF-I Corps Validation Program

- Competitive application to be accepted to program (30 teams per year)
- 18-Week Bootcamp for Innovation Teams (Grad & Undergrads)
  - Teams work on their own idea, or on a corporate project
  - Curricula: IP, tech transfer, market segmentation, building a company and team, cost structure, how to access capital (lean launchpad methodology)
  - Required prospective customer interviews
  - Pitch Ideas/receive feedback. Mentoring from local experts
  - Milestone-based grants ($1-$3K)

Moxie Teaching Incubator

- 27 teams admitted to incubator
- Resources to build prototypes
- Mentorship by experienced entrepreneurs and business experts
- Advisors: design, engineering, legal, marketing, etc.
- Amazon Web Services partnership
- Annual $20k Zahn Prize competition
For Today's Discussion
Opportunities to Build on the Ecosystem

- Reorganize, package and scale up education offerings. Include prototype practice in curricula.
- Entrepreneurism/Intrapreneurism training or degreeed curricula for technical professionals who don’t want an MBA.
- Build domestic and international corporate alliances to connect practical education to innovation at corporations.
- Harness students’ desire for social entrepreneurship, to the benefit of U.S. and International Partners