Crazy Ideas

A talk by
Ken Joy
For the Computer Science Department’s Retreat
Saturday, October 15, 2011
THE CRAZY IDEAS (2011)

Idea #1: HIRE ONLY SENIOR PEOPLE

Idea #2: DOUBLE OUR FUNDING PORTFOLIO

Idea #3: REDESIGN OUR UNDERGRADUATE CURRICULUM

Idea #4: BRING INNOVATION INTO OUR TEACHING METHODS

Idea #5: IMPROVE OUR DEPARTMENTAL INTERFACE

Idea #6: IMPLEMENT A CRAZY IDEA
Crazy Ideas: MOTIVATION

What high-level questions should motivate these ideas?

What would it take for our Department to become one of the top-rank computer science programs in the country? How do we improve our ranking to be in the top 20 programs in the country? What would be the impacts?

How do we prepare ourselves for the changes in internal UC Davis funding models that are approaching? These models will require departments to be more entrepreneurial.

How do we take advantage of current opportunities to build our department? There is one significant opportunity that we should exploit immediately.
Crazy Ideas: MOTIVATION QUESTION #1

What would it take for our department to become one of the top-rank departments in the country?

Current Rankings

I asked five students to find out where our computer science graduate program was ranked in the US.

Findings:

#56 from the GRE Guide
#33 from SAS:Student Zone
#48 from PhDs.org
#39 from US News and World Report
#39 from uscollegerankings.org
Crazy Ideas: MOTIVATION QUESTION #1

What would it take for our department to become one of the top-rank departments in the country?
Crazy Ideas: MOTIVATION QUESTION #1

What would it take for our department to become one of the top-rank departments in the country?

Current Strategy: Move Up!
Crazy Ideas: MOTIVATION QUESTION #1

What would it take for our department to become one of the top-rank departments in the country?

Better Strategy: JUMP UP!

What steps must we take to be ranked #20?

What would be different in our department if we were ranked #20? What is the impact?
Crazy Ideas: MOTIVATION QUESTION #2

How do we prepare ourselves for the changes in internal UC Davis funding models that are approaching?

Funding Streams

Current Funding Model: Top Down. Funding is distributed to the administrative units in a top-down fashion. Friction happens!

Funding Streams Model. Funding is distributed to the departments directly. This includes ICR funds, tuition (by formula), etc. A tax is paid back to fund administrative units.

Impacts. Departments must become more “entrepreneurial.” The administration will have some “motivation” to make departments more successful.
Crazy Ideas: MOTIVATION QUESTION #3

How do we take advantage of current opportunities to build our department?

The Chancellor of our University has a degree in ELECTRICAL ENGINEERING!!

This will not happen again in any of our academic careers

The Chancellor of our University has put a priority on hiring senior people!!! And she will help!

This will not happen again in any of our academic careers
CRAZY IDEAS TALK

Crazy Ideas: MOTIVATION QUESTIONS

What high-level questions should motivate these ideas?

What would it take for our Department to become one of the top-rank computer science programs in the country? How do we improve our ranking to be in the top 20 programs in the country? What would be the impacts?

How do we prepare ourselves for the changes in internal UC Davis funding models that are approaching? These models will require departments to be more entrepreneurial -- and we can take advantage of this.

How do we take advantage of current opportunities to build our department? How can we take advantage of the opportunities presented by Linda Katehi.
Idea #1: HIRE ONLY SENIOR PEOPLE

For the next five positions allocated to the Department, hire only top senior faculty members who can help the Department jump up in the rankings.
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For the next five positions allocated to the Department, hire only top senior faculty members who can help the Department jump up in the rankings.

What do I mean by “SENIOR PEOPLE?”

- Individuals who are in the National Academy of Science, or in the National Academy of Engineering.
- Individuals who will spend over $1 million per year in research expenditures (We should have 5+ of these people in our department).
- Individuals who can lead multiple collaborative efforts with other Departments and programs at UC Davis, other Universities, Industry, or National Labs.
- Individuals who will have an immediate and substantial “WOW” impact.
- Individuals who are on the frontiers of research in computer and computational sciences.
Idea #1: HIRE ONLY SENIOR PEOPLE

For the next five positions allocated to the Department, hire only top senior faculty members who can help the Department jump up in the rankings.

How can we do this?

Make up a plan! Develop a white paper to present to the Dean detailing a plan for hiring. Detail the type of faculty that we desire. Detail our desire to improve our ranking.

Meet with the Dean! Get him to support our plan. Senior faculty are feathers in his cap! Use the Teller Chair as leverage.

Meet with the Chancellor! Get her support! She will be sympathetic with our needs, if we can show the benefits to UC Davis.

Begin the work to find outstanding senior people who we can attract to UC Davis. We need to develop a list of potential candidates, irrespective of area, and find ways to approach candidates now.

Persist! We need to persist in this strategy over several years.
Idea #2: DOUBLE OUR FUNDING PORTFOLIO

Over the next five years, double the amount of external funding acquired by our Department.
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Over the next five years, double the amount of external funding acquired by our Department.

How can we do this?

See Idea #1. If we expand our department with active senior faculty, we will dramatically expand our funding portfolio.

Dramatically Expand our Industrial Portfolio. Our industrial funding has gone down over the past five years, yet our field is driven by advances in industry.


Keep Doing What We Are Currently Doing, but do it 10% more effectively.
Idea #2: DOUBLE OUR FUNDING PORTFOLIO

Over the next five years, double the amount of external funding acquired by our department.

Trends in extramural Funding, 2000-2010

Our corporate funding has dropped!
Idea #2: DOUBLE OUR FUNDING PORTFOLIO

Over the next five years, double the amount of external funding acquired by our department.

Dramatically Expand our Industrial Portfolio

Appoint a Vice-Chair for Industrial Relations! Job Description -- to facilitate industry/campus collaborations, organize meetings between department members and industry sponsors, including industrial affiliates program, meetings with potential donors, meetings with alumni, etc.

Defeat the current apathy toward industrial relations in the Department. We currently have very little enthusiasm toward relations with industry among our faculty.

Hire a “Solution.” Hire a senior faculty member who can lead us in this area. (See Idea #1)
Idea #2: **DOUBLE OUR FUNDING PORTFOLIO**

Over the next five years, double the amount of external funding acquired by our department.

**Leverage our Alumni and Contributors/Partners.**

Develop an “real” advisory board. Stock the board with people that will help us get collaborative projects and funding from industry. Put alumni on the board.

Meet with our alumni regularly. Ask them to contribute. Our alumni is a tremendous untapped source for contributions.

Ask. We need contributions for endowed chairs, fellowships, scholarships, lab support, students support, and our new computer science building.
Idea #2: DOUBLE OUR FUNDING PORTFOLIO

Over the next five years, double the amount of external funding acquired by our department.

Become 10% more productive
Idea #3: REDESIGN OUR UNDERGRADUATE CURRICULUM

Over the next year, develop a modern undergraduate curriculum that will attract quality students to our program, and produce students who can contribute to the computer science field at all levels.
Idea #3: REDESIGN OUR UNDERGRADUATE CURRICULUM

Over the next year, develop a modern undergraduate curriculum...

The Big Bang -- Computer Science -- 1990-2000

Speech Synthesis
Web
Google
Games
Embedded Systems
DataBases
Computation
Search

Architecture Programming Lang.
Operating Systems Theory

Networks
Graphics/Visualization
Security
Artificial Intelligence
Cryptography
HPC
Virtual Reality
Idea #3: REDESIGN OUR UNDERGRADUATE CURRICULUM

Over the next year, develop a modern undergraduate curriculum ...

The Big Bang -- Computer Science -- 2000-2010

- Chemistry
- Library science
- Politics
- Veterinary medicine
- Law
- Psychology
- Medicine
- Plant biology
- Biology
- Computation
- Astrophysics
- Sociology
- Fusion
- Mathematics
- Geology
Idea #3: REDESIGN OUR UNDERGRADUATE CURRICULUM

Over the next year, develop a modern undergraduate curriculum ...

Parallel Methods
Idea #3: REDESIGN OUR UNDERGRADUATE CURRICULUM

Over the next year, develop a modern undergraduate curriculum...

How do we do this?

“Just teach them to solve problems!”

Design a curriculum that emphasizes the creative (problem solving) side of computer science. Have the students learn the “tools” of computer science. Have them use the tools to solve relevant problems.
Idea #3: REDESIGN OUR UNDERGRADUATE CURRICULUM

Over the next year, develop a modern undergraduate curriculum...

How do we do this?

Require students to have “two” projects courses. Create additional projects courses (similar to ECS 193AB) in several areas.

Integrate “parallel” and “problem solving” into ECS 30, 40, and 60. Reorient these courses tend emphasize projects that exercise the creative side of our students. Teach them to use the “tools” of computer science.

Cancel ECS 20. Bring back ECS 100, and call it “Computational Thinking” Redesign it to create “parallel thinkers.”

Cancel our “ethics” and “statistics” course. Free up these faculty members to teach courses on the creative side of computer science.

Implement a tutoring program for entry-level students. Set up a volunteer program where students tutor students. Give them credit for doing this.
Idea #3: REDESIGN OUR UNDERGRADUATE CURRICULUM

Over the next year, develop a modern undergraduate curriculum...

And...

Publicize this! Create brochures, webpages, press announcements. Give talks and presentations. Recruit students actively. Use this new, modern major to attract many new students to our program.

Recognize that this is not a huge change! Nor is it a huge amount of work for the department in general. It is a “tweaking” of a few classes, under a new wrapper.

Forget about ABET! If we are a top-tier program, and we are innovative in our changes to the curriculum, ABET will listen to us!
Idea #4: BRING INNOVATION INTO OUR TEACHING METHODS

Take advantage of collaborative and technological teaching/learning initiatives to improve our teaching.
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Take advantage of collaborative and technological teaching/learning initiatives to improve our teaching.

Questions:

What will be the best way for students to learn in 2020? Will students learn best by sitting in a 100-student classroom listening to a lecture three times per week? Probably not! How do we transition to this new educational reality?

How can we integrate the best technological tools into our teaching? Tablets, laptops, desktops, iTunes U, online lectures, Wikipedia, e-books, collaborative methods, etc.

How can we best use our faculty resources to facilitate learning? Does a faculty member need to do three lectures per week? Can we collaboratively teach courses? What resources could we use to offer a better educational experience for our students?
Idea #4: BRING INNOVATION INTO OUR TEACHING METHODS

Take advantage of collaborative and technological teaching/learning initiatives to improve our teaching.

How do we do this?

Encourage collaborative teaching of courses. Put faculty members “in charge” of course and allow them the freedom to bring in additional resources that enable the students to better learn the material.

Encourage the use of collaborative technology. iTunesU Lectures, online lectures, lectures through the Livermore Valley Open Campus, University of California online initiatives, codecademy.com, etc.

Have others help us teach. Put courses from “other” departments as elective courses. Use lectures from other people at remote sites.

Have the students teach themselves. Encourage collaboration! Encourage collaborative tutoring.
Idea #5: IMPROVE OUR DEPARTMENTAL INTERFACE

Develop an active interface that shows our department to be a vibrant, productive, fun, collaborative, innovative, top-tier unit.
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Develop an active interface that shows our department to be a vibrant, productive, fun, collaborative, innovative, top-tier unit.

We want to look like a top-tier program!

We want to attract the best faculty to our department. (See Idea #1) Faculty who we approach will first look at our departmental interface. This includes webpages, industry relations, professional collaborations, professional participation, funding, and culture.

We want to attract the best graduate students to our department. Great graduate students are the lifeblood of a top-tier research program.

We want to attract the best undergraduate students to our department. Better students implies better classes, easier teaching loads, good potential graduate students, etc., etc., etc.

We want to attract collaborations from the top industrial firms. We want to be at the forefront of research in computer science.
Idea #5: IMPROVE OUR DEPARTMENTAL INTERFACE

Develop an active interface that shows our department to be a vibrant, productive, fun, collaborative, innovative, top-tier unit.

Our current departmental interface...

shouts out --
“SECOND TIER DEPARTMENT
Idea #5: IMPROVE OUR DEPARTMENTAL INTERFACE

Develop an active interface that shows our department to be a vibrant, productive, fun, collaborative, innovative, top-tier unit.

How do we do this?

Overhaul our Department’s external image. Webpages are the first impression of our department for every interaction with students, program managers, potential faculty, industry collaborators and university collaborators.

Create and maintain a Departmental “Press Kit.” We need good stories to tell! Publicizing our portfolio of collaborations, in making these visible, will dramatically improve the department’s interface. Recruiting posters, conference posters, white papers.

Publicize the fun things. Not only the parties, but the really cool collaborations, and the results. Create and publicize results with our students! Send them to the Dean! Send them to the Chancellor! Send them to our Advisory Board! Send them to our alumni!
Idea #5: IMPROVE OUR DEPARTMENTAL INTERFACE

Develop an active interface that shows our department to be a vibrant, productive, fun, collaborative, innovative, top-tier unit.

The Department “Press Kit”

Graduate Study at UC Davis
in the Research Group of Ken Joy

September 2020

Introduction
Are you interested in graduate study, and are looking to join a active research group? The research group of Ken Joy at UC Davis works on research problems in several areas of visualization, computer graphics, and computer vision, and has a variety of exciting projects currently in action. UC Davis is one of the top universities in the world in visualization and computer graphics, and we have a large number of faculty, students, postdocs and researchers working in these areas. If you join our team, you will be working with some of the best researchers in the world today in a well-funded group that works on state-of-the-art research problems.

Who will you be working with?
Ken Joy is a Professor in the Computer Science Department at UC Davis. He came to UC Davis in 2006 in the Department of Mathematics and was a founding member of the Computer Science Department in 1967. For the past several years, he has been Director of the Institute for Data Analysis and Visualization (IDAV) at UC Davis. He is a Visiting Scientist at Lawrence Livermore National Laboratory, and a Faculty Computer Scientist at Lawrence Berkeley National Laboratory. His research group regularly collaborates with scientists and engineers on problems of visualization, computer graphics and computer vision, and publishes regularly in the premiere...
Idea #6: IMPLEMENT A CRAZY IDEA

Over the next year, implement (at least) one of these crazy ideas
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We have been doing these talks for a long time!

And...?
Idea #6: IMPLEMENT A CRAZY IDEA

Over the next year, implement (at least) one of these crazy ideas

How do we do this?

Overcome the risk-adverse UC Davis culture. “Over many decades Davis has developed a culture that permeates its institutions and people, one that can best be described as risk-averse, modest and insular.” WAG Report, 2010
CRAZY IDEAS TALK

Idea #6: IMPLEMENT A CRAZY IDEA

Over the next year, implement (at least) one of these crazy ideas

How do we do this?

Recognize that we all get better when our program gets better. New productive senior faculty increases the opportunities for all of us! Better students and funding increases our productivity! Innovative teaching methods increase our productivity, and increase the learning experience for students. And it becomes a lot more fun!

What its like working in a second-tier program!
Idea #6: IMPLEMENT A CRAZY IDEA

Over the next year, implement (at least) one of these crazy ideas

How do we do this?

Just do it! Successful programs come from innovating, learning what works, and rapidly fixing our mistakes -- rather than getting things perfect the first time.
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