Straight Talk: CS, UCD

Dept. of Computer Science
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(Acroread keystrokes: left/right-arrow keys to move among slides; ctrl-L for fullscreen; ctrl-Q for quit)

THESE SLIDES AVAILABLE AT
http://heather.cs.ucdavis.edu/ucdcs.pdf

Is CS the Right Major for Me?

Coming up:

- proper background

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- career prospects for CS majors

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  - in CS only at your parents' suggestion :-)

Job Market Evolution

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- recently about 20% (though more in the last year) and likely so in future

Evolution cont'd.

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- age discrimination (Nat. Res. Council, *Building a Workforce for the Information Economy*, 2001)
- beware of "shortage" claims made by vested interests

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- CS is more than just programming; learn the *whole computer system*.
- Ever-increasing need for good verbal skills.

CS Grad Jobs: Technical

Here you directly apply the technical knowledge you learned in (and also **OUTSIDE!**) school.

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- computer security specialists (**very hot topic**, and a UCD *forte'*)
- hybrid fields, e.g. bioinformatics, financial modeling

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Here you may use little, if any of your CS background directly, but it can be a big “plus.”

Survey: 1/3 of EE/CS students at MIT now consider EE/CS to be a “liberal arts” major (P. Wallich, *IEEE Spectrum Careers*, Oct. 18, 2005).

- technical management

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- patent law

CS Curricula at UCD

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- interesting minors

CS Majors at UCD

We, the CS Dept., are in the College of Engineering. We have two majors, one in Engineering (CSE) and one in L&S (CS), currently with about 250 students in each .

- Computer Science (CS):
  — administered by CS Dept. (i.e. us)
  — degree in Letters & Science
- Computer Science and Engineering (CSE):
  — administered by CS Dept. (i.e. us)
  — degree in Engineering
- Computer Engineering (CE):
  — administered by ECE Dept.
  — degree in Engineering

Curricular Comparison

Major, department, college, software depth, hardware depth, flexibility:

major	dept	coll	sw	hw	flex
CS	CS, Eng.	L&S	10	5	10
CSE	CS, Eng.	Eng.	10	8	1
CE	ECE, Eng.	Eng.	8	10	1

- numbers are ratings on 1-10 scale
- all 3 majors properly called “computer science”
- benefit of CSE/CE: you see the whole machine
- benefit of CS: flexibility allows you to do a minor, even a double major

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- Grads of the two majors tend to get the SAME kinds of jobs.
- Most employers do NOT prefer an Engineering degree (CSE) over a Letters and Science degree (CS).
- Just choose the major you are interested in.

Interesting Minors

Many CS (L&S) majors have minors, e.g. in Math or Statistics. Here are two minors which are especially related to CS:

- Technology Management: undergraduate minor offered by the Graduate School of Management
- Bioinformatics (currently under development)

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- UC vs. CSU

UCD CS Faculty Research

"Claims to fame"—nationally-known research groups—include (not a full list):

- Bioinformatics (3 faculty)
- Cryptography/Comp. Security (6+ faculty)
- Graphics (7 faculty)
- Networks (6+ faculty)

Many faculty have close ties to industry (Intel, Sun, HP, etc.). 

uses an online security method developed by Prof. Rogaway.

National Research Recognition

Awards include:

- Prof. Matt Franklin, Cryptography
- Prof. Dan Gusfield, Bioinformatics
- Prof. Kwan-Liu Ma, Graphics
- Prof. Phil Rogaway, Cryptography
- many have NSF Career Awards, Best Paper Awards, patents, etc.

Authors of leading research textbooks include:

- Prof. Matt Bishop, Computer Security
- Prof. Biswanath Mukherjee, Optical Networks

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- a discrete-event simulation course
- a scripting language course

UCD Commitment to Students

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- Faculty very approachable, know students personally.

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- Generally, more employers recruit at UC schools than at CSU.

UC vs. CSU cont'd.

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- We are the source! E.g. Cal Poly CS Dept. has four faculty who got their PhDs here at UCD.

Location and Jobs

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- Proximity to Sacramento means:
  - Lots of good internships available in state government.

Advice on Learning Strategy

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- transition from high school

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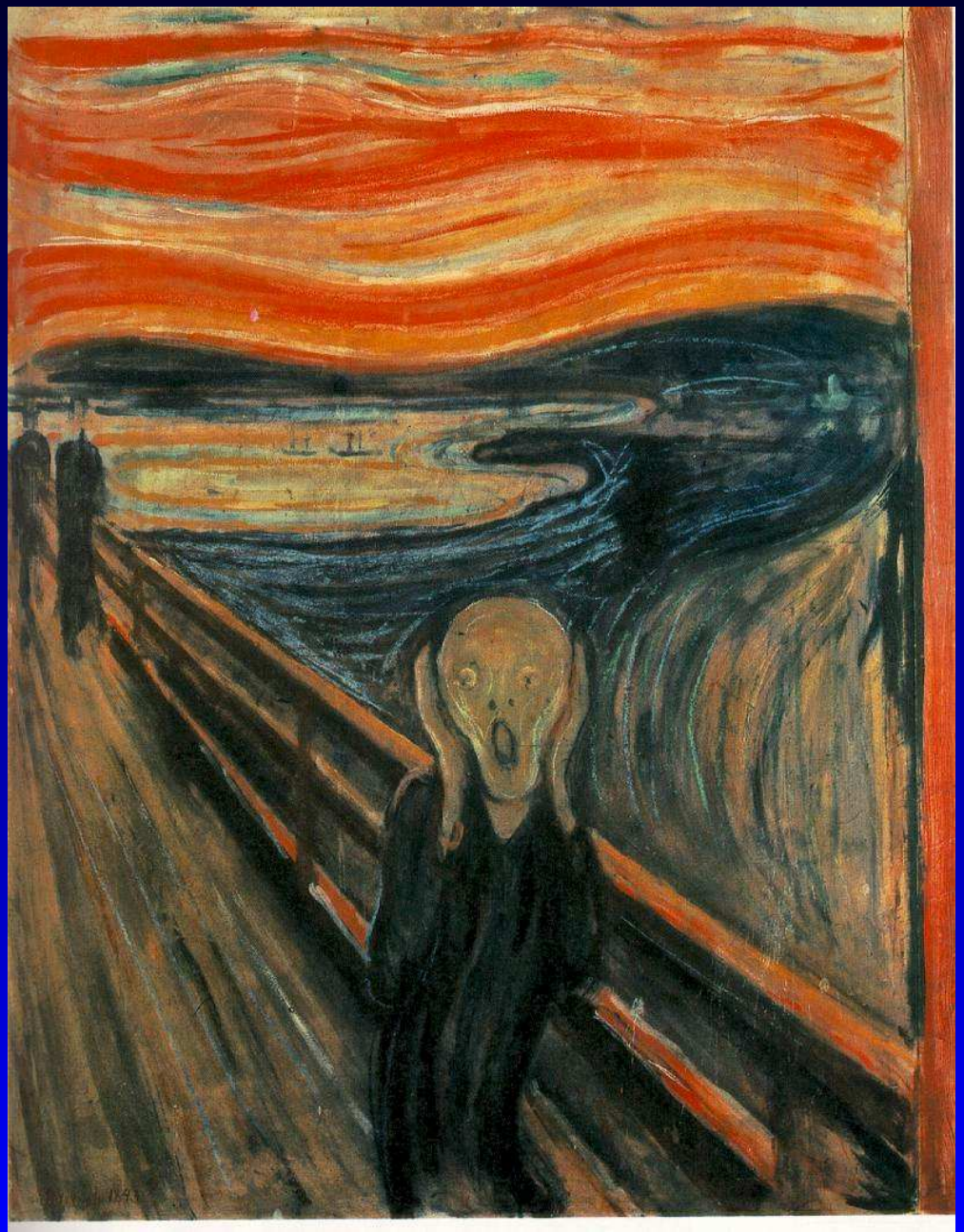

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- **Workload:** Student comment—"One [UCD] course is like 3 high school courses."
- **Quarter system:** Gets going right away.
- **Don't worry!** You'll do fine. But be prepared for big change.

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- “Question Authority!”
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- Put Linux on your PC, and take an active role as your own system administrator.
- Become really proficient at Linux, by USING it on a daily basis, for all your work: programming, e-mail, word processing, Web use, etc.

OUTSIDE cont’d.

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- Develop your communication skills. This does NOT come from taking more English classes. It's an attitude, a willingness to speak up, a pride in one's writing.
- Can you read—and understand—*The Cuckoo's Egg: Tracking a Spy Through the Maze of Computer Espionage*, by Clifford Stoll?

More on Co-ops/Internships

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- “Internship” generally means part-time work while in school.
- Typical timing: start at end of junior year, though many start at end of sophmore year.
- Be aggressive in search: campus Career and Internship Center; Usenet newsgroup ucd.cs.jobs; friends/relatives in the industry.

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- Those with proper AP Computer Science credit *could* skip ECS 30 (1^{st} prog. course), but we strongly recommend retaking it.

Integrated BS/MS Program

- If you want to do software development, an Master's degree will really enhance your prospects to obtain such employment.
- All UCD computer science majors (CS, CSE, CE) offer an integrated BS/MS option.
- Get two degrees in less time than if you did them separately. Nominal five-year time for the integrated program, though could be longer.
- Grad school is a completely different world. To really get the intellectual (and practical) benefit, do Plan I (thesis), not Plan II (exam).

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It would be hugely beneficial for you to become an expert at Linux, which is the most popular variant of Linux.

Linux

Students are strongly encouraged to install Linux on their home PCs:

- Have the same environment at school, home.
- Learn lots of valuable system admin. skills.
- Enhance your job prospects.
- The only way to really know Linux is to USE it on a daily basis, for all your work: programming, e-mail, Web use, etc.
- Linux User's Group of Davis (LUGOD) one of the most active in the nation.