

Invite your friends to take CS10 next sem!



UC Berkeley
EECS Lecturer
Pierce Vollucci

The Beauty and Joy of Computing

Calendar?

Slip days

Lecture #25 Summary & Farewell



Lab next week
is Survey
(0:20), online
final (1:30)

Register
Iclicker,
then turn
in during
lab or dis

BJC Art or
Poem
Submit this at
final for extra
credit!

Discussion this week is
important – course
feedback + summary

TO FORGET OR NOT TO FORGET?

Google is still requesting guidance on implementing the right to be forgotten but how do you enforce your right and how far does it extend?

<http://bits.blogs.nytimes.com/2014/07/31/google-details-problems-with-handling-right-to-be-forgotten-requests/?ref=technology>

WHO ASKED FOR WHAT?

Large companies follow Google's example of providing transparency reports of user info requests (which continue to increase) but what details they can provide about the requests ironically is still limited by governments.

<http://bits.blogs.nytimes.com/2014/07/31/requests-for-user-data-rise-in-twitters-latest-transparency-report/?ref=technology>



Administrivia: Become active!

- With-Snap! Exam details
 - No exam handed out unless you've filled in both HKN + our survey
 - No “study sheets” needed / allowed since you have access to Snap!
- Final Exam details
 - Only bring pen{,cil}s, **three** 8.5”x11” handwritten sheets (writing on both sides).
 - Leave backpacks, books, calculators, cells & pagers home!
 - Everyone must take ALL of the final!
 - Bring your “Beauty and Joy of Computing” Art/Poem for extra credit!
- If you did well in CS10 and want to be on staff?
 - Usual path: **Lab Assistant** ☐ **Reader** ☐ **TA**
 - Indicate on your final survey whether you're even remotely interested
 - We strongly encourage anyone who gets an B or above in the class to follow this path...



Clickers were worth the time spent

- a) Strongly Agree
- b) Moderately agree
- c) Neutral
- d) Moderately disagree
- e) Strongly disagree



Exciting Future Implications

- In computing, chronic unsolved problem
 - Easy parallel programming
- Implications for apps:
 - HUGE Computing power available in cell phone, car
 - On-body health monitoring
 - Google + library of congress
- As devices shrink...
 - The need for great HCI (human-computer interfaces) critical as ever! (voice, gesture)
- Natural language processing?
- Interact by motion!
- 3D displays?
- Personal Robotics?
- Self-driving cars?
- 3D Printing?
- Optical/quantum computing?
- Personal air vehicle?
- Space travel?
- Computer displays in glasses?
- Flexible displays?
- Smart drones?
- Energy!





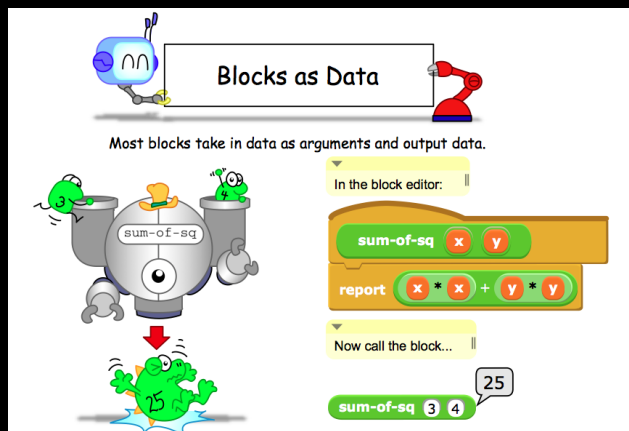
Taking advantage of Cal Opportunities

- “The Godfather answers all of life’s questions”
 - Heard in “You’ve got Mail”
- Why are we one of the top Universities in the WORLD?
 - Research, research, research!
 - Whether you want to go to grad school or industry, you need someone to vouch for you!
 - ...as is the case with the Mob
- Techniques
 - Find out what you like, do lots of web research (read published papers), hit OH of Prof, show enthusiasm & initiative
- <http://research.berkeley.edu/>
- <http://researchmatch.heroku.com/>

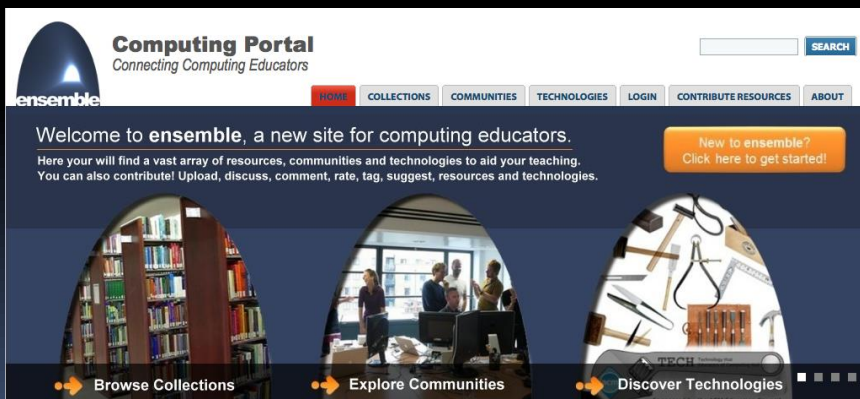


Dan's Research Projects

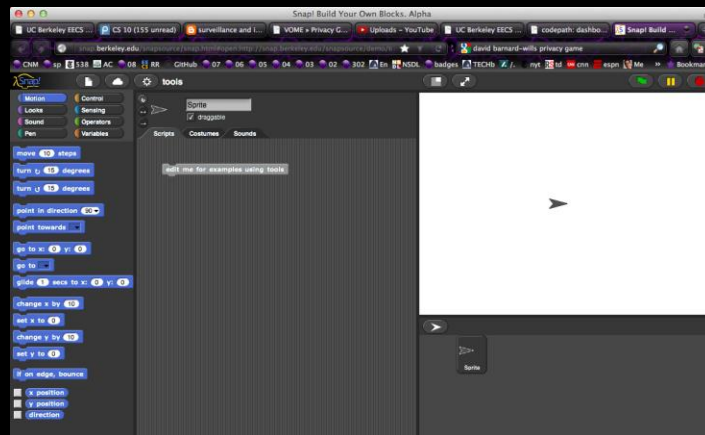
■ CS Illustrated



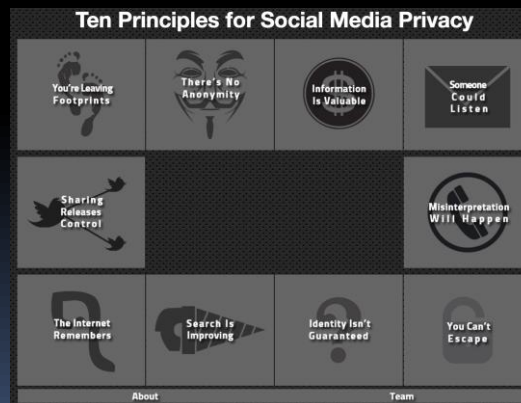
■ Ensemble



■ Improve CS10/Snap!



■ Improve Privacy Teaching



Opportunities Next Semester

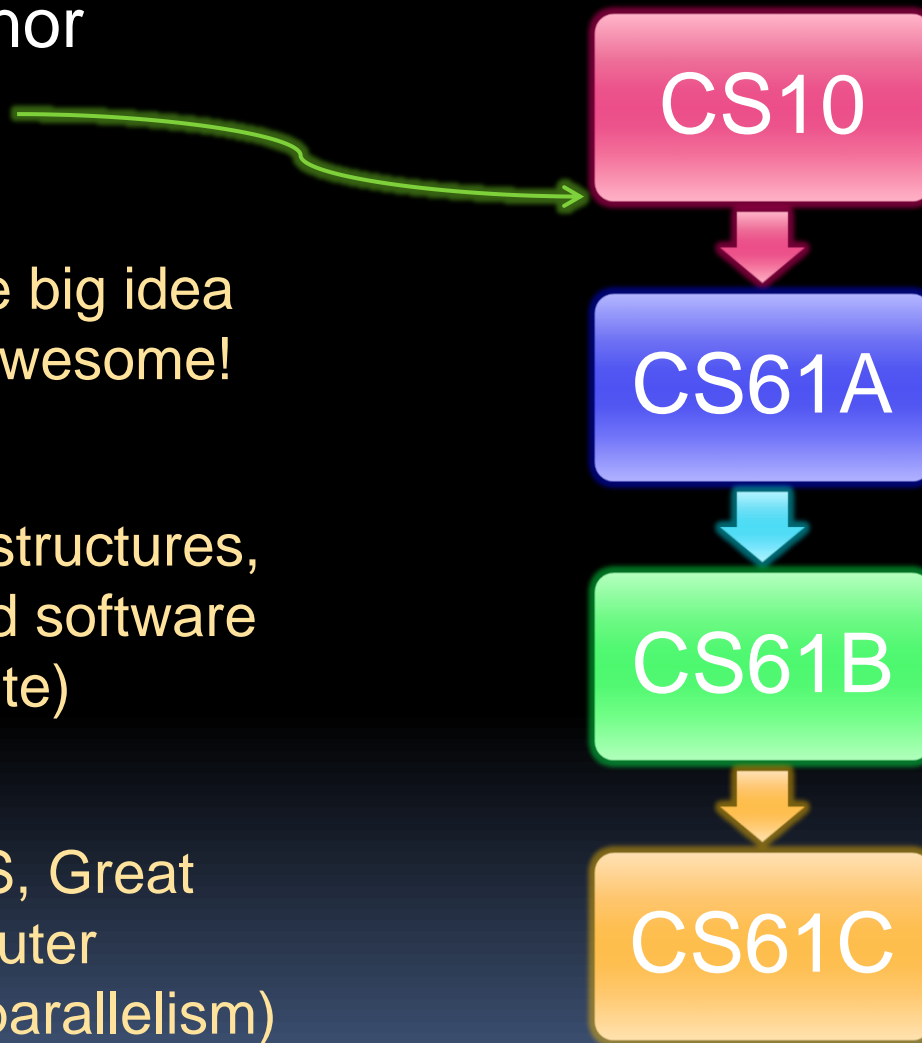
- **CS61A** (1st course in CS major)
 - Structure and Interpretation of Computer Programs, Python
- **CS9 series** (learn a second language)
 - I would recommend Python next, CS9H
- **GamesCrafters DeCal** (Game Theory R & D)
 - Develop SW, analysis on 2-person games of no chance. (e.g., go, chess, connect-4, nim, etc.)
 - Req: Game Theory / SW Interest
- **MS-DOS X DeCal** (Mac Student Developers)
 - Learn to program Macintoshes.
 - Req: Interest. Owning a mac helps, not required.
- **UCBUGG DeCal** (Recreational Graphics)
 - Develop computer-generated images, animations.
 - Req: 3D interest



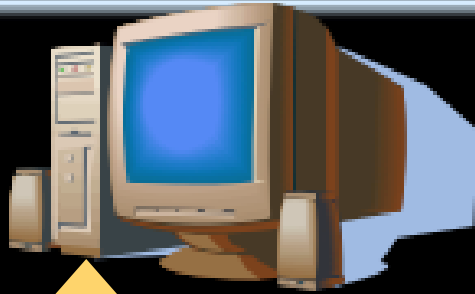


Ok, I'm hooked! Where do I go next?

- CS Major / Minor
 - You are here
- CS61A
 - In Python, one big idea every week. Awesome!
- CS61B
 - In Java, data structures, algorithms and software engineering (lite)
- CS61C
 - In C and MIPS, Great ideas in computer architecture (parallelism)



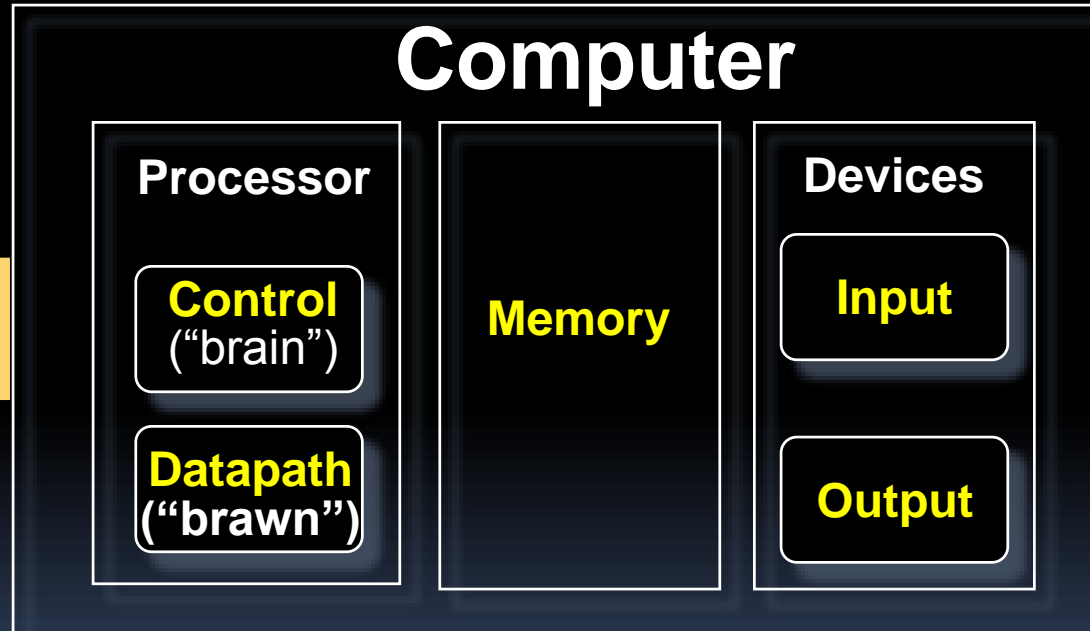
Review: 5 components of any Computer



In the future, what'll be the most important computer component?



- a) Control
- b) Datapath
- c) Memory
- d) Input
- e) Output



Peer Instruction Opinion

- “Forget cloning. Forget TVs on your wrist watch. The biggest invention of the next 100 years will be the ability to directly connect your brain to a machine, aka wet computing.” – Dan Garcia
 - A macaque monkey at Duke University can already control a robotic arm with thought.
 - DARPA interested for mind-control robots & flying
 - Virtual Reality achieved with proper I/O interfacing...



Jose Carmena, UCB EECS Prof
Research: Brain-Machine Interface
www.eecs.berkeley.edu/~carmena/



Things to remember from CS10

- Abstraction
 - The key idea underpinning all computer science
 - ...and (in CS10) functions, HOFs
- ...From Blown to Bits
 - Technology has social implications (privacy, energy, copyright, etc); try to see the big picture
 - It also often has unintended consequences!
 - Things are never black or white, pure good or pure evil
- ...From “Program or Be Programmed”
 - Technology has an explicit and implicit agenda, understanding it is important.
 - Learning to program is empowering (Steve Jobs’ video)

Garcia + Vollucci





Penultimate slide: Thanks to the staff!

- (see the course website for listing & photos)





The Future for Future Cal Alumni

- What's The Future?
- New Millennium
 - Always-on internet connectivity + internet of things!
 - AI breakthroughs
 - HCI breakthroughs
 - Post-PC Era (power is in cloud, interface in pocket)

“The best way to predict the future is to invent it”

– Alan Kay

The Future is up to you!

