



UC Berkeley + UNCC's The Beauty and Joy of Computing



LOCKHEED MARTIN

UC Online

AP CS Principles

UC Berkeley presents
Bears Breaking Boundaries Contest

Grant
Winner

Pilot

Pilot x2

Award
Winner

CE21 MEETING



This is a brief description of what the BJC course is, how it engages and excites students, broadens participation, and how we will train 100 high school teachers over 3 years to teach this well.



bjc.berkeley.edu



Background: Comparison of 5 Pilots I

School	Name	Language	Size	Contact Hrs
MSCD	Living in a Computing World	Lightbot + Scratch	20	60
UCSD	Fluency w/ Information Technology	Alice + Excel	900	50
UW	CS Principles	Processing	40	50
UNCC	The Beauty and Joy of Computing	BYOB based on Scratch	30	45
UCB	The Beauty and Joy of Computing	BYOB based on Scratch	90	98



is an incredible language

Create and share your own interactive stories, games, music, and art

Check out the 2,301,390 projects from around the world!



To create your own projects:



Download Scratch



BYOB adds functions, generic lists, λ

- BYOB (Build Your Own Blocks) \rightarrow SNAP!
 - developed by Jens Mönig w/design input and documentation from Brian Harvey & others @ Cal
 - Leverages awesomeness of Scratch (design, simplicity, multi-media, community of users)
 - SNAP! will be in Javascript, in-the-browser (demo)



Building a For Loop and calling it. What other languages make it this easy?



CS10 in one slide

- Big Ideas of Programming
 - Abstraction
 - Algorithms (2)
 - Recursion (2)
 - Functions-as-data, λ (2)
 - *Programming Paradigms*
 - *Concurrency*
 - *Distributed Computing*
- Beauty and Joy
 - "CS Unplugged" activities
 - All lab work in pairs
 - Two 3-week projects in pairs
 - Of their own choice!!
 - One 3-page paper
 - Of their own choice!!
- Big Ideas of Computing
 - HowStuffWorks
 - 3D Graphics
 - Video Games (expanded at UNCC)
 - Computational Game Theory
 - Research Summaries
 - AI
 - HCI
 - Apps that Changed the World
 - Social Implications of Computing
 - Saving the World with Computing
 - How Twitter Works (guest lecture)
 - Cloud Computing
 - Limits of Computing
 - Future of Computing



Textbook and Readings

- Selected Reading
 - Taken from great book (*Blown to Bits* by Abelson, Ledeen, and Lewis) + articles + videos
 - Current events EVERY DAY (e.g., IBM's Watson vs Jeopardy; Stop Online Piracy Act)
- All resources FREE
 - Textbook and articles online.
 - SNAP! software free online.
 - Videos on YouTube.





Format Is Flexible

- UCB Format:
 - 7 hrs/wk * 14 weeks

Mon	Wed	Fri
Lecture	Lecture	Discussion
Lab	Lab	
Lab	Lab	

- High Schools:
 - full year course
 - varying hours/week
 - less homework
 - (maybe none)
- Some content must be optional!

- UNCC Format:
 - 2 * 75 mins/wk * 15 weeks
 - lab/discussion combined



45% Women, ~57% of top 22 students!

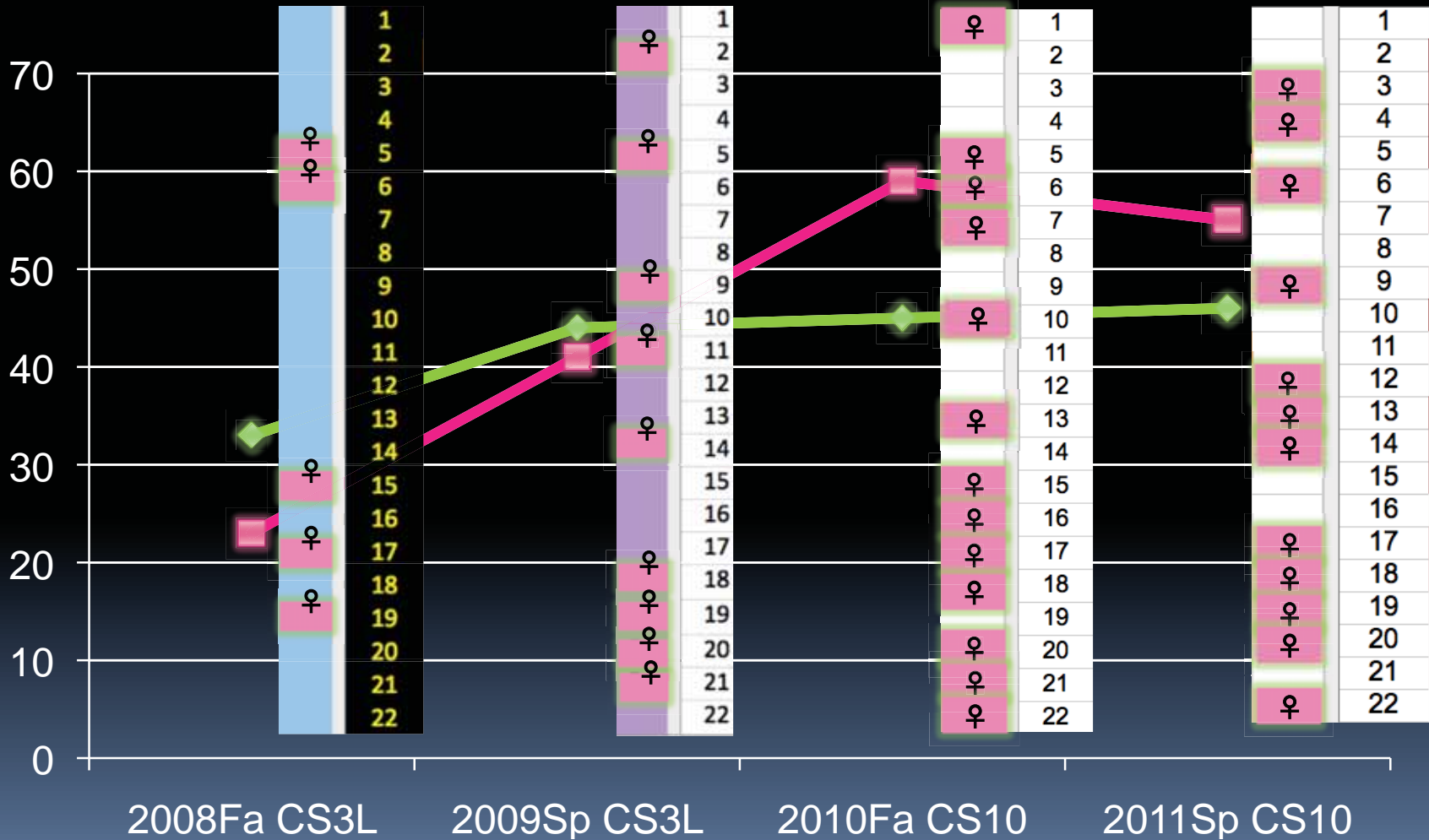
◆ % Women ■ % Women in Top 22

Women GPA: 3.06

3.14

Men GPA: 2.87

3.09



CS 10 YouTube Testimonials



- Justin Barnes (L) & Ian Birnam (R)
 - Ian: “The class itself was amazing ... I had a really fun time ... Building our own projects was great ... The lectures were really interesting ... I never really got into computing but because of this class now I’m really interested in computing and being a possible CS major. ... Anyone even remotely interested in computers should take it!”
 - Justin: “The class is incredibly engaging. The atmosphere is unlike anything I’ve ever taken here. I would recommend it to any friend. I’m a senior, but honestly, if I had taken this class earlier, I would have considered CS as a major.”



CE21 Proposal

- Cluster: University hub, strong CSTA chapter
 - “Petals around flower”
- We train 1 week F2F
 - Teach them online tools, hard prog ideas
- 4 wks online course
 - Intensive, most prog
- 1 Epilogue F2F week
 - Wrap up, exam, project, map to HS situations
- Monthly support
 - Through local CSTA chapter

