

CS 61C: Great Ideas in Computer Architecture (Machine Structures) Cal Cultural Heritage

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Administrivia

- What classes should I take (now)?
- Take classes from great teachers! (teacher > class)
 - Distinguished Teaching Award (very hard to get)
 - » <http://teaching.berkeley.edu/dta-dept.html>
 - HKN Course evaluations (≥6 is very good)
 - » <http://hkn.eecs.berkeley.edu/student/CourseSurvey/>
 - EECS web site has plan for year (up in late spring)
 - » <http://www.eecs.berkeley.edu/Scheduling/CS/schedule-draft.html>
- If have choice of multiple great teachers
 - CS152 Computer Architecture and Engineering (Spring '11: Asanovic)
 - CS162 Operating Systems and Systems Programming
 - CS169 Software Engineering (for SaaS with Fox)
 - CS194 Engineering Parallel Software (Fall '11: Keutzer)
 - CS267 Applications of Parallel Computer (Spring '11: Demmel)

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Comments on Extra Credit

- Sent email summary with Top 3 results to Par Lab sponsors
- Intel #1: “Cool!!! ... will these teams (esp 1.) write reports?”
- Intel #2:
“Bob is right - cool. I hope the winning team got an A.
Seriously, are they going to write a tech report describing how they beat Goto SGEMM?
I know of at least one major customer who makes purchasing decisions based on multiplication of tall, skinny matrices.”

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Comments on Extra Credit

- Microsoft:
“Wow, just imagine how well those students who *did not need the extra credit* would have done !”

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Survey highlights so far: Please fill out!

- 40% did extra credit
 - 70% read research papers for ideas
 - 36% tried autotuning,
 - 36% tried advanced algorithms
- Midterm: 66% fair, 20% somewhat hard
- Enjoyed & learned a lot: Projects 1, 3, 4, LogicSim labs, SIMD lab, Extra Credit
- Average 14 Hours/Week:
≤10 (9%), 11-12 (26%), 13-14 (28%), 15-16 (20%), 17-20 (9%), ≥ 21 (7%)
- New 61C: 51% prefer it, 33% love it

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What to Emphasize about Cal culture?

- Top public university (US News)
- Top graduate program in the world?
 - 35/36 departments in top 10
- University doing the most public good
 - Washington Monthly 2009!
- Faculty Awards?
 - 8 current Nobel Prize winners (21 all time)!
 - 3 Turing Award winners (“Nobel of CS”)!
 - 3 Fields Medalists (“Nobel of Math”)!
 - 86 in National Academy of Engineering!
 - 135 in National Academy of Science!
 - 28 “Genius” awards (MacArthur fellows)Source:
<http://www.berkeley.edu/about/honors/>

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Cal Cultural History: Football!

- Started with “soccer” (aka football)
 - 11 on a team, 2 teams, 1 ball, on a field; object is to move ball into “goal”; most goals wins. No hands!
- New World changes rules to increase scoring:
 - Make goal bigger! (full width of field)
 - Carry ball with hands
 - Can toss ball to another player backwards or laterally (called a “[lateral](#)”) anytime and forwards (“[pass](#)”) sometimes
- How to stop players carrying the ball? Grab them & knock them down by making knee hit the ground (“[tackle](#)”)
 - In soccer tackle the ball; football tackle the person

What to Celebrate About Cal?

CAL FOOTBALL

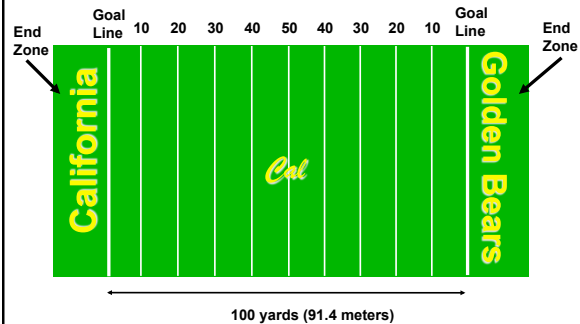
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ABCs of American Football

- Score by...
 - Moving football into goal (“[cross the goal line](#)” or “[into the end zone](#)”) scoring a “[touchdown](#)”
 - » (6 points)
 - Kicking football between 2 poles (“[goal posts](#)”) scoring a “[field goal](#)”
 - » (worth 3 points, unless after touchdown, then its just 1 point: “[extra point](#)”)
- Kick ball to other team after score (“[kickoff](#)”)
 - laterals OK
- Game ends when no time left (four 15 min quarters) and person with ball is stopped
 - Soccer: two 45 min halves, time stops play

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Football Field



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The Spectacle of American Football

- Cal’s archrival is **Stanford**
 - Stereotype is Rich, Elitist Snobs
 - E.g, derby Man City vs. Manchester United
- Play nearby archrival for last game of season
 - Called “[The Big Game](#)”: Cal vs. Stanford, winner gets a trophy (“[The Axe](#)”): Oldest rivalry west of Mississippi; 100th in 1997
- American college football is a spectacle
 - School colors (Cal **Blue & Gold** v. **Red & White**)
 - Nicknames (Golden Bears v. Stanford Cardinal)
 - School mascot (Oski the bear v. a tree(!))
 - Leaders of cheers (“cheerleaders”)

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The Spectacle of American Football

- “[Bands](#)” (orchestras that march) from both schools at games
- [March & Play](#)
 - Before game, at halftime, after game
- Stanford Band more like a drinking club; (Seen the movie “[Animal House](#)”?)
 - Plays one song: “[All Right Now](#)” (1970)
 - Cannot march and play

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1982 Big Game: "The Play"

"Top 20 favorite sports event in 20th century",
Sports Illustrated

"Greatest Football Play of All Time," *Best Damn Sports Show*

"...The Play, widely considered the most dramatic ending in college football history", AP news

"...widely considered the most famous play in college football history," *Stanford Magazine*

("The Play" Has own entry in Wikipedia)

• Stanford

–Quarterback is John Elway, who goes on to be a professional Hall of Fame football player (retired 1999)

–Possibly greatest quarterback in college history?

» In 1982, they had lost 4 games in last minutes

• Stanford has just taken lead with 4 seconds left in game; Cal team captain yells in huddle "Don't fall with the ball!"; [watch video](#)

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Notes About "The Play" (1/2)

• Cal only had 10 men on the field; last second another came on (170 pound Steve Dunn #3) and makes key 1st block

• **Kevin Moen #26:** 6'1" 190 lb. safety,
–laterals to Rodgers (and doesn't give up)

• **Richard Rodgers #5:** 6' 200 lb. safety, Cal captain "Don't fall with that ball."

–laterals to Garner

• **Dwight Garner #43:** 5'9" 185 lb. running back

–almost tackled, 2 legs & 1 arm pinned, laterals

• **Richard Rodgers #5 (again):** "Give me the ball!"

–laterals to Ford

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Notes About "The Play" (1/2)

• **Mariet Ford #1:** 5'9", 165 pound wide receiver
–Smallest player, leg cramps; overhead blind lateral to Moen [and](#) blocks 3 Stanford players

• **Moen** (again) cuts through Stanford band into end zone (touchdown!), smashes Trombonist

• On field for Stanford: 22 football players, 3 Axe committee members, 3 cheerleaders, 144 Stanford band members (172 for Stanford v. 11 for Cal)

– "Weakest part of the Stanford defense was the woodwinds." -- Cal Fan

• Cal players + Stanford Trombonist (Gary Tyrrell) hold reunions; Stanford **claims Garner's knee was down** revises history (Changes score on Axe to 20-19); – [see virtual video](#)

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The Future for Future Cal Alumni

• What's The Future?

• New Century, Many New Opportunities: Parallelism, Cloud, Statistics + CS, Bio + CS, Society (Health Care, 3rd world) + CS

• Cal heritage as future alumni

–Hard Working / Can do attitude

–Never Give Up ("Don't fall with the ball!")

"The best way to predict the future is to invent it" – Alan Kay (inventor of personal computing vision)

Future is up to you!

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Thanks

• Randy and my busiest semester in a while

–Agreed to do 61C in July, no TAs, too late to get ready, ...

• Thanks to TAs: Andrew Gearhart, Michael Greenbaum, Conor Hughes, and Charles Reiss

• Thanks to you for courage to take experimental version of 61C

• You didn't fall with the ball!

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Notes About "The Play" (1/3)



"Alright here we go with the kick-off. Harmon will probably try to squib it and he does. Ball comes loose and the Bears have to get out of bounds. Rogers along the sideline, another one... they're still in deep trouble at midfield, they tried to do a couple of...the ball is still loose as they get it to Rogers. They get it back to the 30, they're down to the 20...Oh the band is out on the field!! He's gonna go into the endzone!!! He got into the endzone!! ...

THE BEARS HAVE WON!!! THE BEARS HAVE WON!!! Oh my God, the most amazing, sensational, dramatic, heart rending... exciting thrilling finish in the history of college football!"

– KGO's Joe Starkey

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