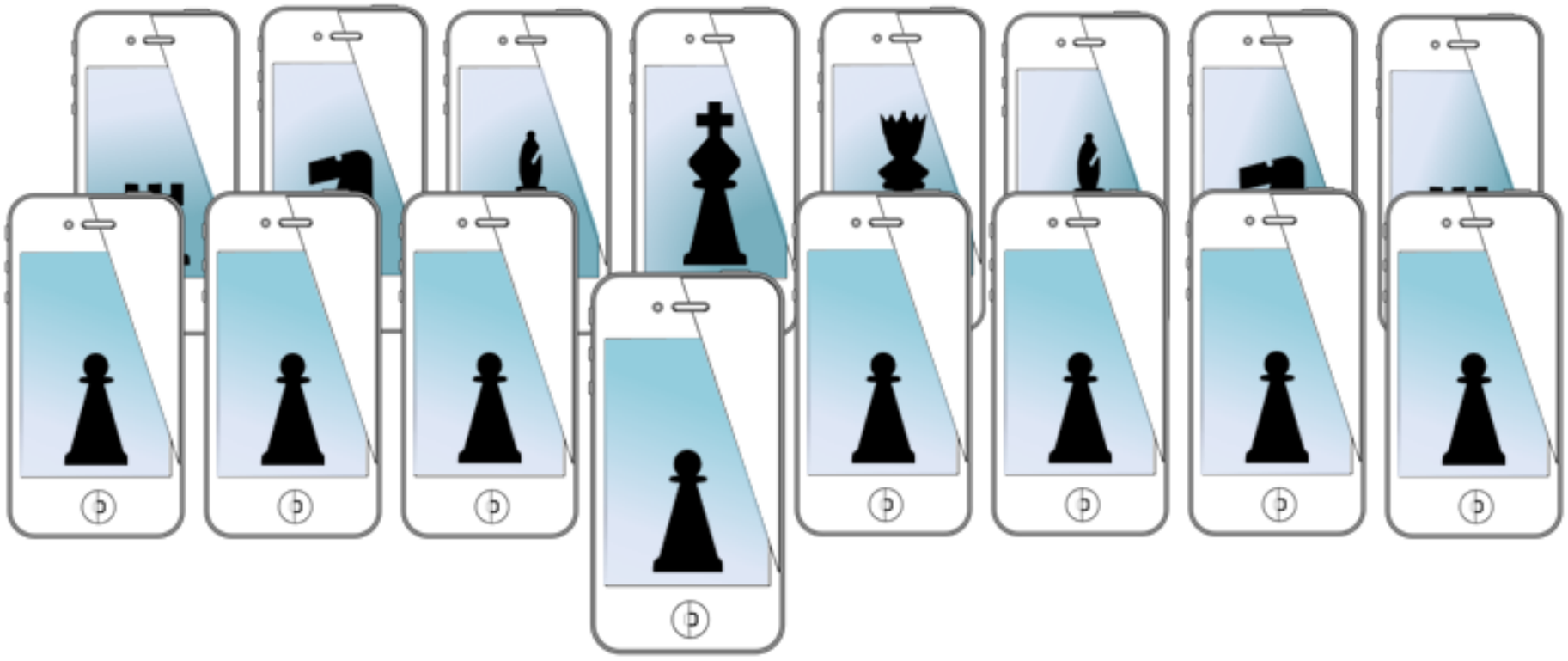
MOBILE SENSING & LEARNING



CS5323 & 7323

Mobile Sensing and Learning

course introduction

Eric C. Larson, Lyle School of Engineering,
Department of Computer Science, Southern Methodist University

agenda

- class logistics
- introductions
- what is this mobile sensing course?
  - and what this course is not…
- course goals
- how to do well
- syllabus
  - hardware, lab access, grading, MOD
- Xcode and git

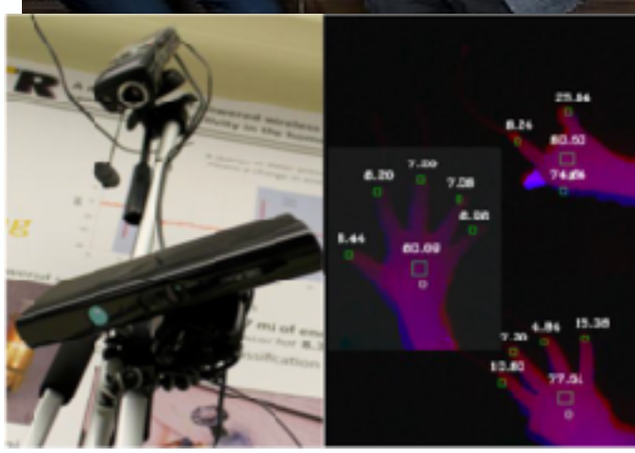
course logistics

- lecture: in class and via Zoom
- lab: no lab section this semester
- office hours: Tues/Wed 4-5PM (via Zoom only)
- we will use canvas for managing the course
- and GitHub for managing code:
  - https://github.com/SMU-MSLC
- Zoom étiquette

introductions

- education
  - undergrad and masters from Oklahoma State
  - PhD from the university of Washington, Seattle
- research
  - signal, image, and video processing (mobile)
    - how can combining DSP, machine learning, and sensing make seamless computing?
  - security
    - smartphone side channels
  - mobile health
    - moving outside the clinic: how mobile sensing can help patients and doctors
  - sustainability
    - how technology can increase awareness

http://eclarson.com



SMARTPHONES

The sound of things to come?

SMU research finds new way to snoop: vibration of typing is translatable

By JORDAN WILKERSON
Staff Writer

Smartphones are like living things. With their cameras and microphones, they can see and hear. They can detect the amount of ambient lighting, the air pressure and the temperature — among a host of other aspects about the environment they're in.

Six years ago, less than half of Americans owned a smartphone. Four out of five own one now, says the Pew Research Center. There are millions of people walking around every day with a vast array of these sensors in their pockets.

And smartphones can record all of it.

This has created major concern about how easily ones privacy can be invaded by these sensor-rich devices, with partic-

See RESEARCH Page 4B

introductions (if time)

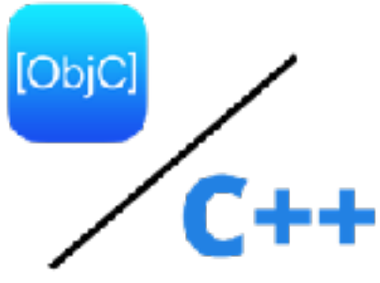
- me
  - Eric 👍
  - Dr. Larson 👍
  - Prof. Larson 👍
  - other 👎

- about you:
  - name (what you go by)
  - grad/undergrad
  - department
  - **something true or false**

what is this course (and not)

- mobile sensing
  - activity recognition **some, yes!**
  - audio analysis **yes!**
  - vision analysis **yes!**
- machine learning **yes! treated as black box**
- microcontroller communication **no, not anymore**
- general iOS development **some basic skills**
- animation and graphics **no, except to display data**
- user interface design **some, all apps rely on user**

for what we do not cover…

- take the free Stanford iOS course!
- prerequisite: model based coding
  - because you will learn at least one new language:
    - objective-c 
    - swift 
    - python 
    - c++ 
    - objective c++ 

course goals

- exposure to iOS development, MVCs
- understand how to **use embedded sensors**
- **exposure** to **machine learning** for mobile sensors
  - new: more use of built-in ML in iOS
- real time analysis of data streams
    - applications in mobile health
- **present** and **pitch** applications

how to do well

- complete the lab assignments on time
- start the **lab assignments early, with your team**
- iterate and test your apps
- use good coding practices, lazy instantiation, recycle classes, get on Apple's developer website for more info
- have fun—seriously
- collaborate, collaborate, collaborate
- and come to class or attend Zoom!

syllabus

- attendance
  - highly recommended, but you can watch video if needed
  - video of classes through Panopto (published after class)
- hardware is available for checkout
  - need a team formed (do this before the end of the week)
    - teams are expected to work remotely together
  - mac minis and iPhones available for checkout
  - you can use your own stuff, just need an iPhone 5S or better
- Now let's head over to canvas

syllabus (via canvas)

- grading
- flipped assignments
- final projects
- MOD

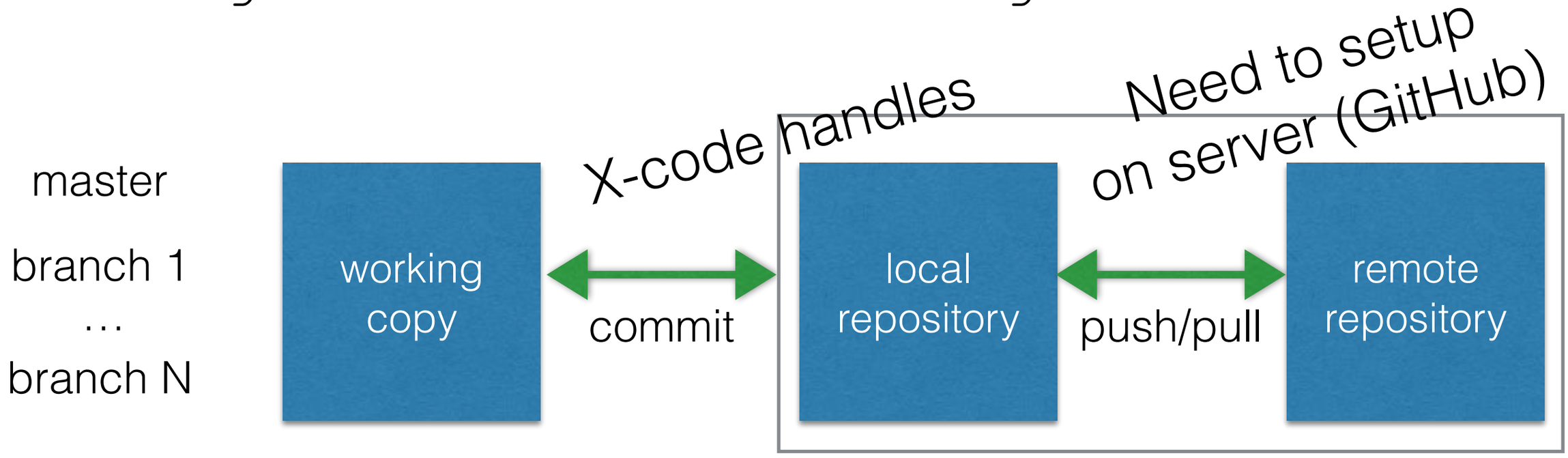
before next class

- look at canvas
- look at GitHub
- get a team together (groups of 1, 2 or 3, no exceptions)
  - contribute **equally**, **everyone** codes, **everyone** designs
  - **pick good members** with different skills than you
  - take turns **watching each other code** (I know…)
  - use the lab time for coding together in breakout rooms
- all assignments are already posted for the semester and all flipped module videos

Xcode and git

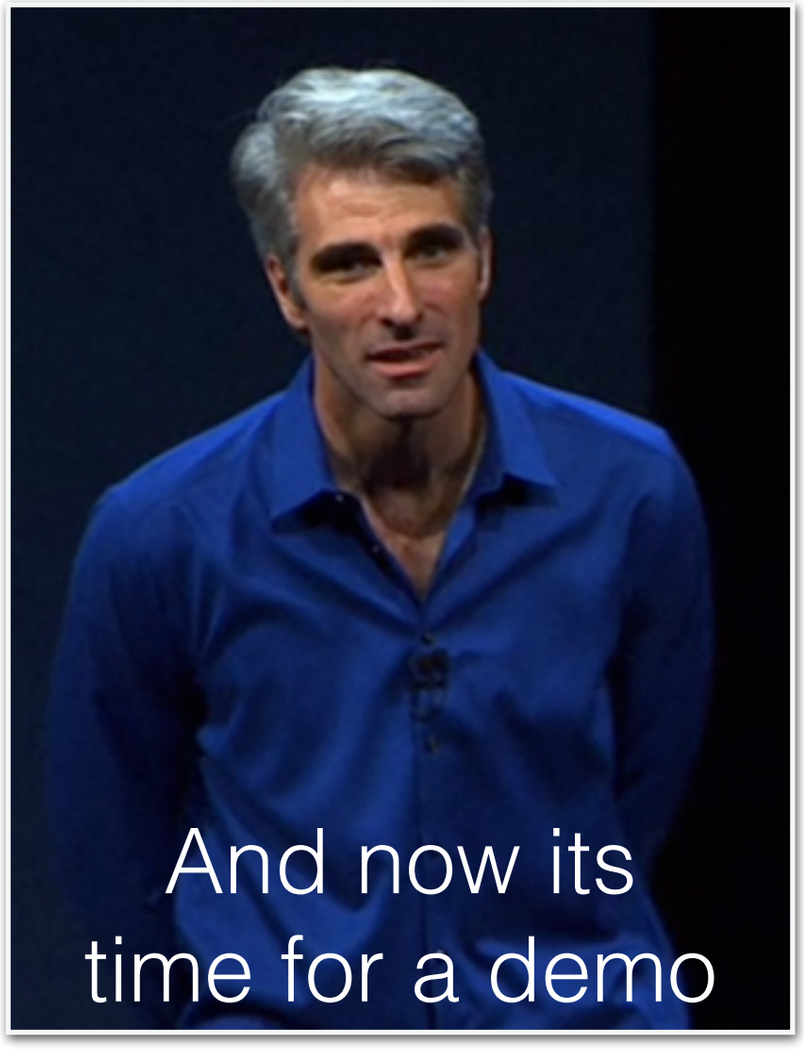
- built into unix (and therefore OSX) and Xcode
- use it when developing with teams or just by yourself
- branching, merging, and all the jazz

```
git init
git add .
git commit -m"starting commit"
```



git with Xcode

- provides GUI for most git commands
  - commit, branch, push, pull, etc.
- **rarely** is command line needed
- git is great for code!!
- but not great for storyboards …



for next time…

- have teams figured out
- so hardware can be checked out (if you want it)

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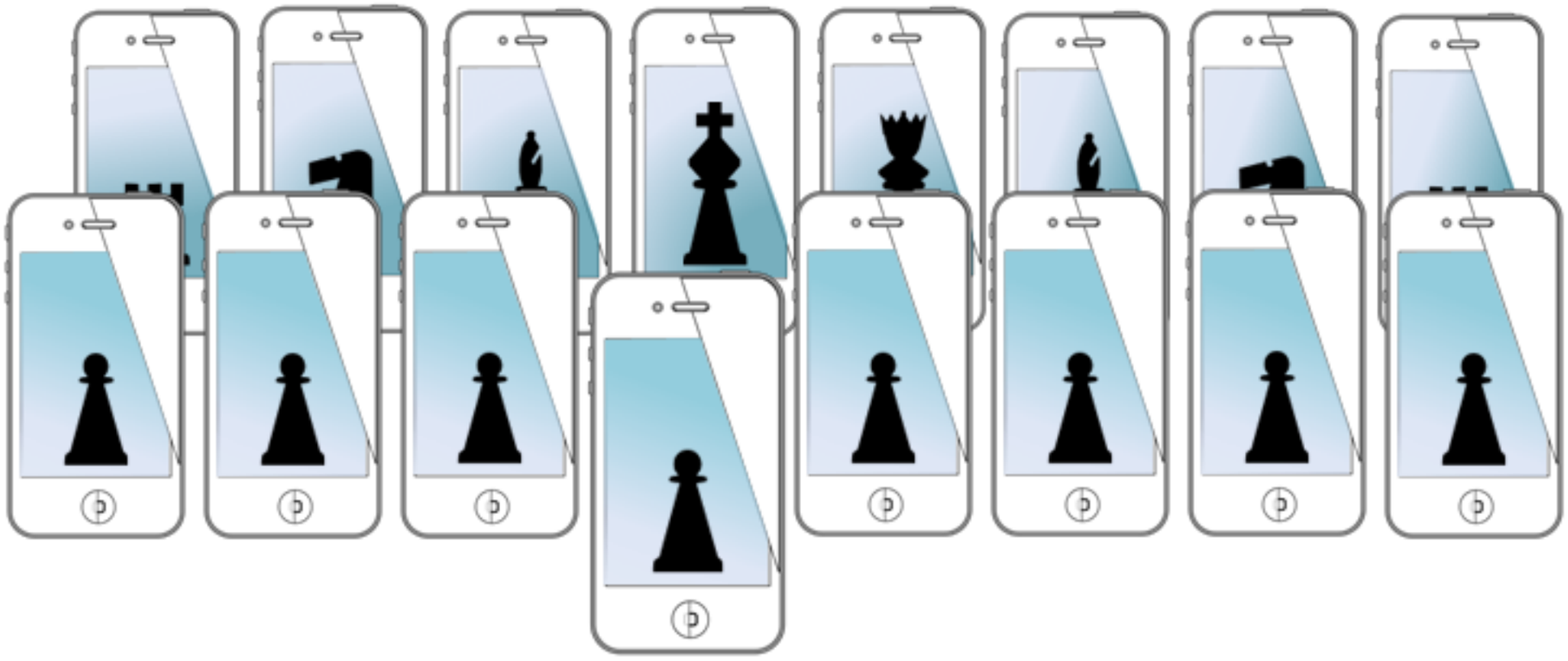

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