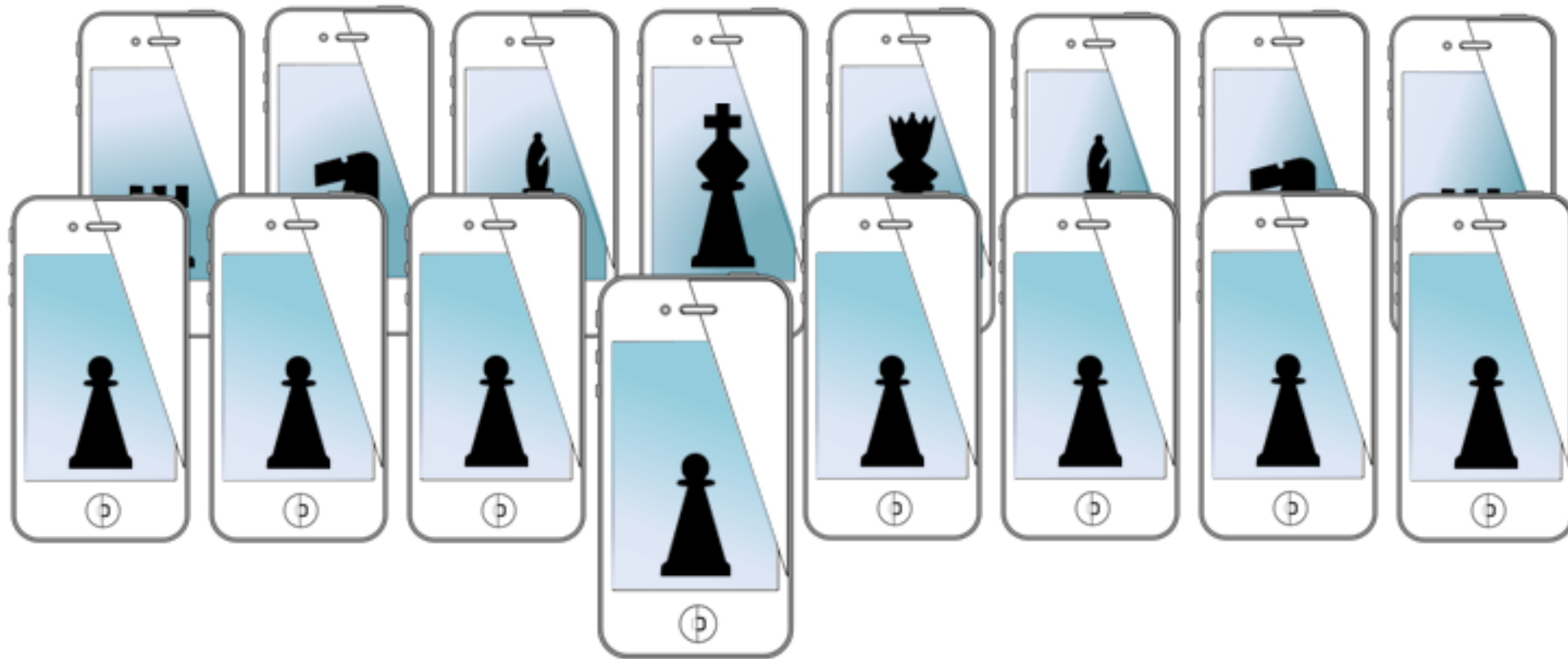# MOBILE SENSING & LEARNING

CSE5323 & 7323

Mobile Sensing and Learning

week one, lecture one: course introduction

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

agenda

- introductions

- class logistics

- 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

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?
  - natural gestures
    - novel interaction techniques and user interface technology
  - mobile health
    - moving outside the clinic: how mobile sensing can help patients and doctors
  - sustainability
    - how technology can increase awareness

  http://eclarson.com

introductions

- about you:

  - name (what you go by)

  - grad/undergrad, department, and major

  - something true or false

    - that's all we have time for…

course logistics

- lab: Wednesday 5-7PM, but up for discussion

- we will use canvas for managing the course

- and GitHub for managing code:

  - https://github.com/SMU-MSLC-2016

what is this course (not)

- mobile sensing

  - activity recognition **some, yes!**

  - audio analysis   **yes!**

  - vision analysis   **yes!**

- machine learning   **some, for inference**

- microcontroller communication **yes!**

- 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!

  https://itunes.apple.com/us/course/developing-ios-7-apps-for/id733644550

  Also go to: https://developer.apple.com

- prerequisite: model based coding (or ability to pick it up quick)

- CSE's will find some of this review, EE's will find some of this review — just not at the same time

- creative computation? creativity and design are well rewarded in this class

course goals

- exposure to iOS development, MVCs

- understand how to use embedded sensors, on/off phone

- exposure to machine learning as a service

- real time analysis of data streams

    - applications in mobile health

- **present** and **pitch** applications

how to do well

- complete the lab assignments on time

    - there is no such thing as a late assignment

- start the **lab assignments early**

- 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

syllabus

- attendance

  - video of classes will not be available, sorry

- hardware is available for checkout

  - mac minis (password protected, do not change)

  - iPhones (password protected, do not change)

  - you can use your own stuff, but will need provisioned iPhone 5S or better

syllabus: lab assign.

- 50% of grade (5 labs @ 9% each, 1 lab @ 5%)

- turn in source code via canvas, show me the app

- usually every two weeks, one assignment per team (teams of 2-3)

- deliverables are worth 90% of the lab grade

- each lab deliverable will be graded on

  - how efficient your implementation is

  - how well you use proper coding styles and interface guidelines

  - how well each elements meets specified criteria

- Make it memory and computationally efficient, use hardware acceleration

- Comment code so that it is readable and immediately understandable

- remaining 10% of the points are reserved for truly exceptional work and work that is above and beyond in one or more elements of the application, incorporating elements not discussed in class and having superior performance

syllabus

- in class assignments (flipped assignments)

  - 25% of grade (5 @ 5% each)

  - watch videos before class

  - come ready to work on assignment as a team

  - turn in assignment at end of class

  - absence == no credit

final project

- worth 25% of grade

  - 15% from iOS application

  - 5% from final presentation

  - 5% from video (like kick-starter, with more detail)

The Mother of all demos (MOD)
Students will have the option to "opt out" of the final project website in exchange for a more risky "mother of all demos" demonstration. Groups that opt into this must meet **all** of the proposed specifications of their mobile applications (additionally, these demos should be more difficult). These specifications must work **flawlessly** during the final project presentation. If any specification is not met, the MOD **does not apply and a video summary will be due**. Note that it does not matter how close the specification was to working: if a portion of the application was specified to run in 5 seconds, but takes 5.1 seconds, the MOD is not met (it is **all** or **nothing**). You will be told immediately after demonstration whether the design specifications were met.
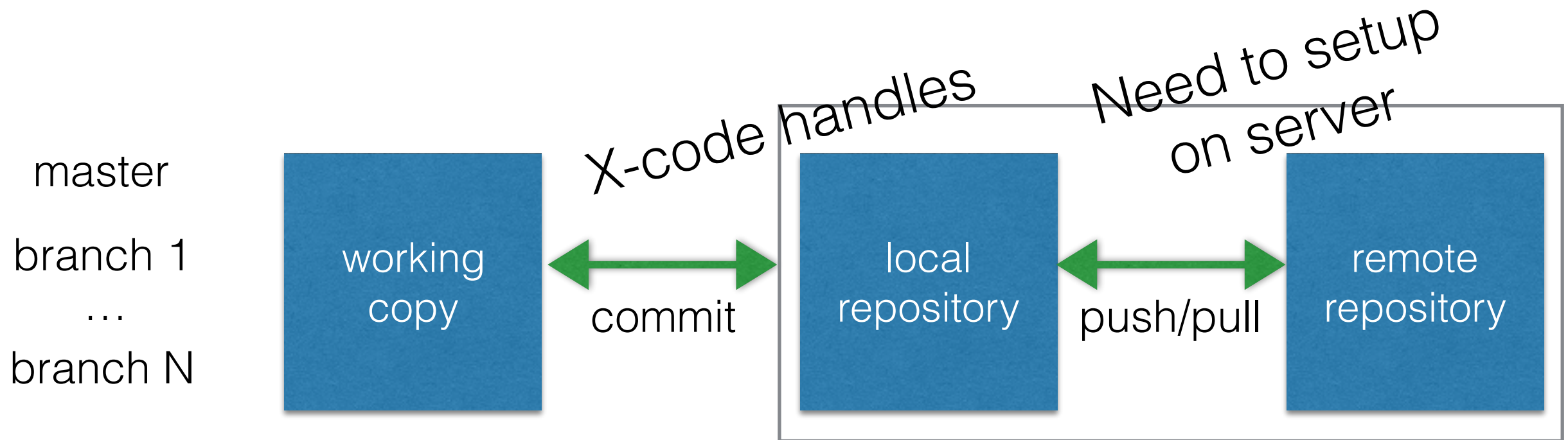
before next class

- look at the class website

- get a team together (groups of 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…)

- assignment 1 is already up!
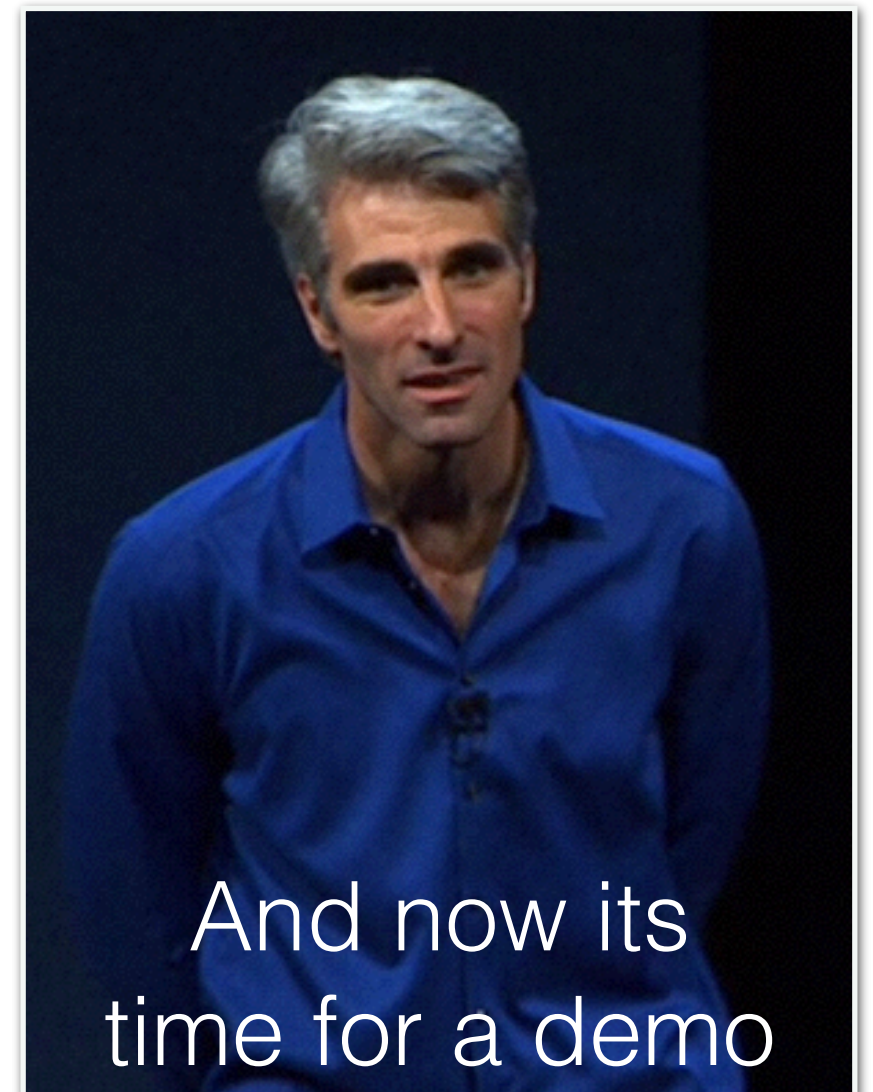
  - let's check it out…

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"
```

X-code handles

Need to setup on server

master

branch 1

…

branch N

working copy ⟷ commit ⟷ local repository ⟷ push/pull ⟷ remote repository
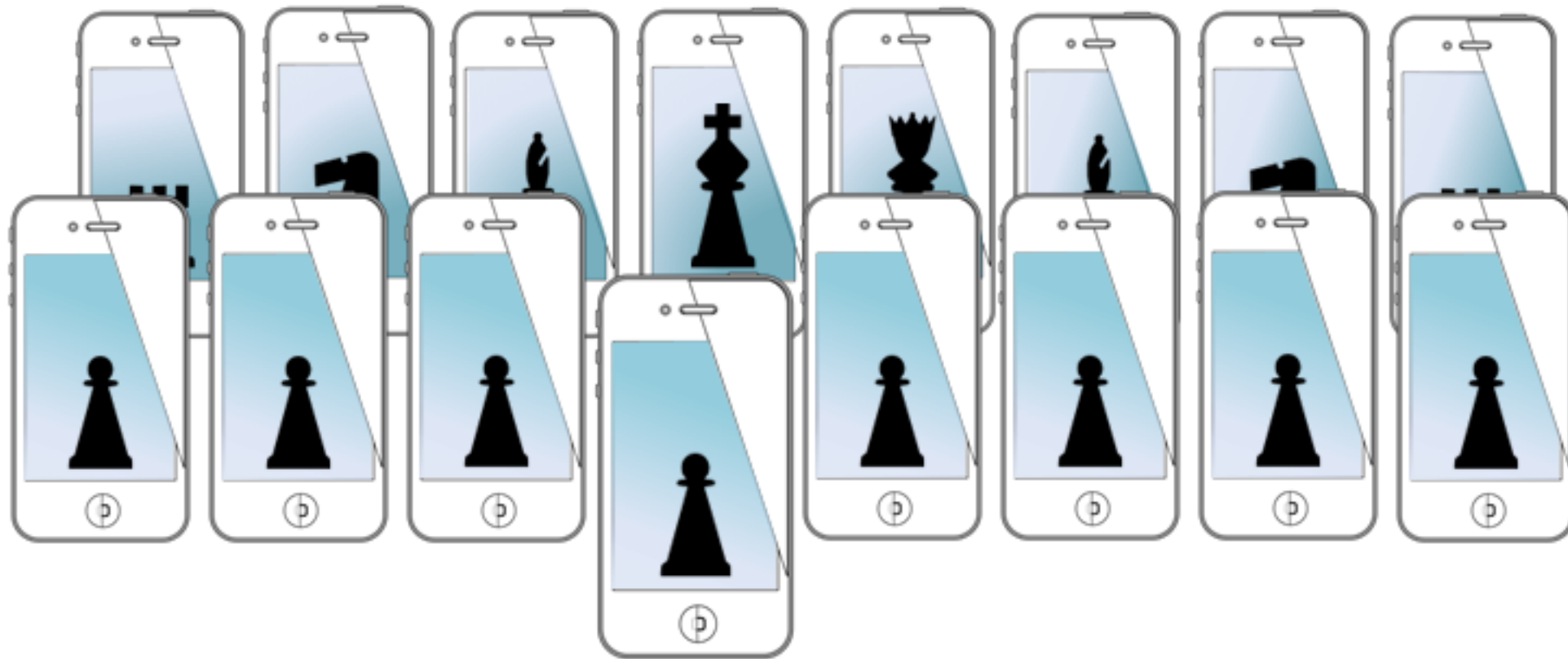
git with Xcode

- 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 …

And now its time for a demo

MOBILE SENSING & LEARNING

CSE5323 & 7323
Mobile Sensing and Learning

week one, lecture one: course introduction

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