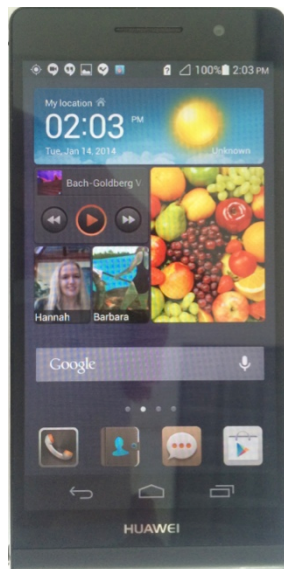# ECE 1778:
Creative Applications for Mobile Devices

Lecture 5

February 5, 2014

Today

1. Fierce Mobile
2. Logistics
3. Assignments P4 and A4
4. Project Management and Execution
5. Proposal Discussions

Fierce Mobile

Fierce Mobile

- Fierce Mobile IT is a good daily newsletter on all things mobile & IT
  - Fierce Mobile IT

- Actually a large family of 'Fierce Mobile' newsletters, including
  - Fierce Mobile Health

- Easy to Join – see 'Subscribe' link at bottom

- Recent Examples ..

Logistics

Assignments

- A3 and P3 due next week
  - Except A3 part 1 due Friday

- A4 and P4 are also available, won't be due until Feb 25
  - Discussed today

- A2 and P2 are almost finished being graded

Assignments A4 and P4

Assignment P4

- **Threads, Internet Files and Databases**
  - Read a file containing names from an Internet-addressed file, do on a separate thread
  - Put names into a database
  - Emit searches on Google for the names, and display one by one
  - Use a separated thread to do a separate task and communicate back to main UI thread (used in many apps)
  - In addition, make appropriate use of fragments

- **Due in two weeks – Tuesday Feb 25th at 6pm.**

Assignment A4: Creativity, Sensors and You

- Key outcome of this course is to have Appers always thinking of ways to use this new Canvas that is a mobile device

- Goal of this assignment is to have you come up with creative apps in your field that make use of the sensors available today,
  - and perhaps some from the future

Recall, Mobile devices are:

- Powerful computers, capable of:
  - Optimization
  - Signal Processing
  - Data searching and sorting
- Networked well to the Internet
- Capable of several kinds of 'output'
  - Screen
  - Sound
  - Vibration
  - Light

Be Creative!

- **Part 1**
  - Reprise & augment the description of your field, like that in A1

- **Part 2**
  - Given these sensors:
    1. Accelerometer
    2. Gyroscope
    3. Barometer
    4. Camera
    5. Light Sensor
    6. Proximity Detector
    7. Humidity Sensor

A4, Part 2, continued

- **Come up with 3 Novel apps that make use of these sensors, in your field**
  - Novel = no direct hit as an app for a Google search that there is a mobile app that already does this.

- **Ask you to give some sense of the difficulty of the sensor processing you're asking for**
  - e.g. Vision processing is hard, as you've heard
  - should calculate # of pieces of data that need to be looked at

- **Can use any combination of sensors.**
- **Goal – give you practice being creative!**

A4 Part 3

Consider the future, many more cool sensors invented:

1. 3D Sensing e.g. XYZ sensor – see <u>video</u>.
2. An ultrasound sensor that can look inside a body.
3. An Emotion Sensor – which says which emotion is being felt by the holder of the phone, and gives the intensity on a scale from 1 to 10.
4. A Blood Pressure Sensor
5. Brain Electrical Activity Sensor – brain electrical map.

■ Invent three more Novel apps in your field

■ Due in 2 weeks – Tuesday, February 25th at 6pm

Project Time Line

Project/Course Time Line

1. Forming Groups
2. One-Page Proposal
   – Mostly approved, will discuss today
3. **Project Plan**
   – Due Today
4. **Proposal/Plan Presentations**
   – February 12 & 13
   – **NOTE EXTRA LECTURE Thursday Feb 13, 6-8pm, MP 103**
- No Lecture Reading Week
- Special User-Design Lecture Feb 26
5. Spiral 2 & Spiral 4 Presentations
   – 2: March 5/12   4: March 19/26
6. Final Presentations
   – Weeks of April 2 & 9
7. Final Report Due April 10th (15)

Project Management and Execution

Your Project Plans

- Will have given you a well-defined final goal

- Should also have broken up work up into pieces
  - The block diagrams required in proposal

Soon: Start Executing! How?

Focus: Spiral/Agile/Incremental Method

■ Get the smallest part of your App working as soon as possible.

- Exercise it, revise it, and build on it
- Use your common sense to see if it is working, and if your goals need to be adjusted
- After today's discussions, you should identify what the first working useful version should be 'Spiral 1' done in 2 weeks.

Waterfall vs. Spiral Method
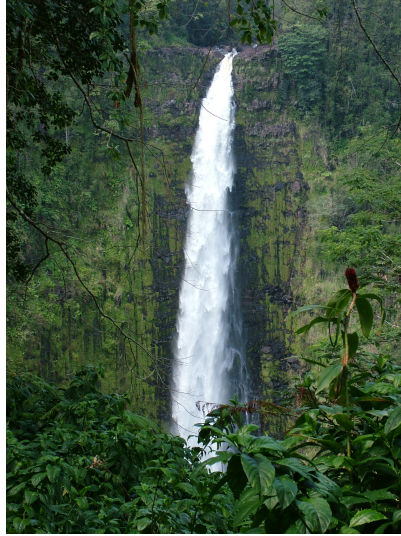
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- ■ Waterfall means plan everything out, documenting carefully
- ■ But Software really needs to be exercised to see how well it works -> Spiral
- ■ Particularly true for user interface oriented software
  - – but essentially true in all projects!

Boehm's Spiral Model

Agile Software Manifesto

Agile Software Values: Choose

- **Individuals and interactions** over processes and tools
- **Working software** over comprehensive documentation
- **Customer collaboration** over contract negotiation
- **Responding to change** over following a plan

- while there is value in the items on the right, we value the items on the left more
  - From http://en.wikipedia.org/wiki/Agile_software_development

Spiral Method of Development

- To emphasize how important this is, the next key milestone in the course, is **Spiral 2**

- **Spiral 1** is what you get plan to get working the week of Feb 26
  - You should describe what this will be in your plan presentation next week – functionality and features achieved.

- **Spiral 2** is what you get working by Wed March 5
  - The complete set of (additional on Spiral 1) features and functions

You'll Present Spiral 2 March 5

■ March 5 is four weeks from now, a long time

- You'll want the Spiral 1 working well before!

- You should think now what your Spiral 1 is going to be

- Include Spiral 1 and Spiral 2 description in the plan you present next week

Key Coming Steps in Project

1. **Identify a Spiral 1 and Spiral 2**
   - Take your block diagrams, and break down into tasks
   - Those tasks will tell help you decide what to shoot for in Spiral 1 and Spiral 2
   - Be prepared, of course, to adjust goals as you go along

2. Define the tasks that need to happen
   - Estimate how long they will take
   - If too long, re-do goals
   - Estimation is difficult; have to try; failure OK; can ask for help
   - Assign Tasks to Each Team Member

Project Execution

- You're in a team, and you need to find an effective way to coordinate the team's work

- Agree
  - Who is doing what
  - When work will be done

- Have weekly or more frequent meeting; every 3 days?
  - If not in person, use Skype video or phone

Rule 1 for Effective teams:

- **Make commitments,**
  - check on commitments (task execution) each meeting

- **Don't be unpleasant or nasty if commitment's not met, work together**
  - However, don't 'look away' from it – face it and make a plan
  - Figure out if commitment was too ambitious
  - Re-work goals/commitments to be done next

- **Do have expectation that contributions of each team member are equal**

What About Disagreements?

- You're in a team, you're likely to have disagreements
- If this is your first project experience of this kind, this can be stressful

- **Resolution of disagreements is a crucial skill**
  - Take this as a opportunity to learn how to do it

Issues and Relationships

There are often two things going on when there is conflict:

1. Specific issues that give rise to a problem

    –   Factual/strategic differences of opinion

2. Relationship between people

    –   Trust, respect

Modified from: http://www.execstrategies.com/Facilitator/ConflictResolutionStrategies.htm

Relationship Focus

- **Trust is at the root of all good relationships**
  - Personal and professional
  - Must establish common goals and work towards them together
  - Trust is created when everyone believes that everyone else has the same goals

1. Maintain a fair, respectful communication style
   - with careful listening
2. Expect and accept another's right to disagree
3. Realize the value of disagreement
   - it can lead to something better

Project Plan Presentations

Next Week in 2 Classes:

Wednesday February 12th 9-11am (Usual)

Thursday February 13th, 6-8pm (MP 103)

Plan Presentations Start Feb 12

- Formal Presentation
  - Using PowerPoint, Keynote, PDF or OpenOffice

- You will not know in advance if you're presenting on the 12th or 13th, to be fair, so come prepared to talk
  - Unless you've expressed a hard constraint to me, already (or soon)

- Send the presentation to me by email by **Tuesday Morning, February 11th, at 12 noon**
  - Jonathan.Rose@ece.utoronto.ca (note new email; old still works)

Time Limit

- **6 Minute Time Limit**
  - I will start timer that makes annoying sound when done, and expect you to be finished within 10 seconds after that.
  - **Omit needless words**

- Three Minutes for Questions

Plan Presentation Contents

The Essence of the Plan submitted today:

1. Goal (What & Why)
2. Give Mock-ups of What User Will See
3. Block Diagram of Code & explain – recall Lect 4
4. Statement of Risks/Issues
5. What do you need to learn that you don't know
6. **Spiral 1, 2 and 4 goals**
7. Apper Statement
   - 1 minute, for Apper to say how this fits into their field & what their contribution will be

Notes on Time Limit & Clarity

- **Time Limit is both serious and important**
  - To this course and your ability to communicate going forward

- **How many slides can there be in 5 or 6 minutes?**

- **How much can go on a slide?**

- **Are pictures good things in presentations?**

- **Do you start with the details or the big picture?**

- **What place does deep jargon have in a short presentation?**

(34)

How Do You Know if Presentation is Good?

- Practice it, standing up, in front of:
  - First, no-one
  - Then, a few others
  - Not too much, though, either, as it shouldn't sound memorized

- **Time it**
  - if too long, cut it
  - Get to the point quicker

- Gulak's law: "You can describe anything to anyone in any amount of time"
  - Just have to pick the right level of abstraction

How Do You Know if Presentation is Good?

In Practice:

- Listen to what you are saying
- Does it make sense **listening with the ears of the audience?**

Who is Your Audience?

- A mixture of technically-literate and people with expertise in some another area [different from your own!]
- Make sure the lay people know **what** you're doing - the goal
- OK to go somewhat technical after that, but don't assume we're all expert in every sub-field of ECE and CS

Selected Proposal Discussions

Proposal Discussions

- **Would like to review some (not all) of the proposals submitted last week, and engage in a discussion**
  - To help all of you with your planning & execution

- **Be prepared to stand up, and describe your proposal**
  - What & Why
    - Describe the idea, and its motivation
  - Scope
    - Give a good sense of functionality – what is involved
    - Show that you've thought about the pieces

  - Apper: how it relates to field/expertise

Project Names

Smarter Lock	Face2Name
Positive Snake	Surgical Trainer and Navigator
Qualitative Research Companion	Baton
Asteria	SmartParking
MyAlly	WorldyMobile
Pocket Tutor	Speech Coach
PowerOfGlass	myACL
Critter	MyROM
Maintenance Agent	Acoustica
AR Nutrition Label Buddy	