ECE 1778:
Creative Applications for Mobile Devices

Lecture 5

February 10, 2021

Today

1. Logistics
2. Assignments P3, S4
3. The Hatchery & Entrepreneurship
4. Project Planning, Management and Execution
5. Group Interaction
6. Proposal Presentations Specification – next week
7. Peer Review of Proposals
8. Feature and Sub-Feature Discussions

Logistics

Assignments

- **Grades for P1 and S1 now posted**
- **S3 & P2 due yesterday**
  - 1 each is missing!

- **S4 and P3 now posted**
  - Both due in two weeks
  - Providing space for proposal work this week

Assignment P3

Making Photo Sharing more functional!

Assignment P3

■ More capabilities and features of photo sharing app

– Learn about database composite queries

1. Add captions to photos before upload

   – Including using Neural Network/MLkit to generate captions!

   – Pre-existing network and code pretty much given, don't worry

2. Anyone can add comments to your photos

3. Display only your photos **or** everyone's

Video Example of Assignment P3

https://www.dropbox.com/s/wvywz0sisabl446/P3-Demo.mp4?dl=0

Project Time Line

Project Stages

1. **Groups Formed**
2. **Project Topic Approval-in-Principle**
   - Groups send me **all** GitHub IDs (& project name) if haven't yet
   - Everyone should use GitHub including Specialists
3. **Project Proposal/Plan**
   - Document Due February 15th - see lecture 3/4 for details
4. **Proposal & Plan Presentations**
   - Slides due Feb 16th, given February 17th - this lecture details
   - **NOTE EXTRA LECTURE Wed February 17th, 6-8pm** (no food)
5. **No lecture week of Feb 24**
6. **Lecture on User Experience & Presentations March 3rd**
7. **Spiral 2 & Spiral 4 Presentations**
   - 2: March 10/17 4: March 24/31
8. **Final Presentations**
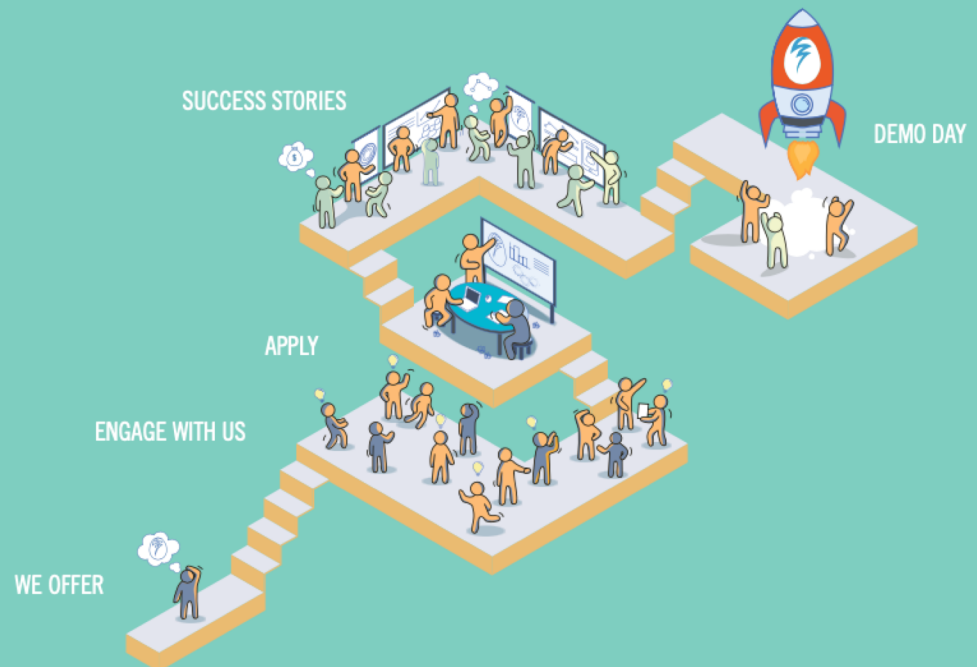   - Weeks of April 7/14
9. **Final Report Due April 21st**

Aside: The Hatchery

You May Wish to Consider Commercializing your Project

hatchery.engineering.utoronto.ca

In previous years

- **Have suggested the Hatchery "too late" to groups**
  - Have already made plans for the summer

- **Am bringing up now for that reason**

- **You can apply now if you wish;**
  - Can also enter closer to the end of this course

- **Demo Day 2017 Video**
- **Demo Day 2018 Video**

Project Planning, Management and Execution

Your Project Planning

- When you're finished your planning, you'll have 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 smallest part of Project working as soon as possible.
  - Exercise it, revise it, and grow it
  - Specialist can test it
  - Use your common sense to see if it is working, and if your goals need to be adjusted

- You must identify what first 'working' useful version should be soon
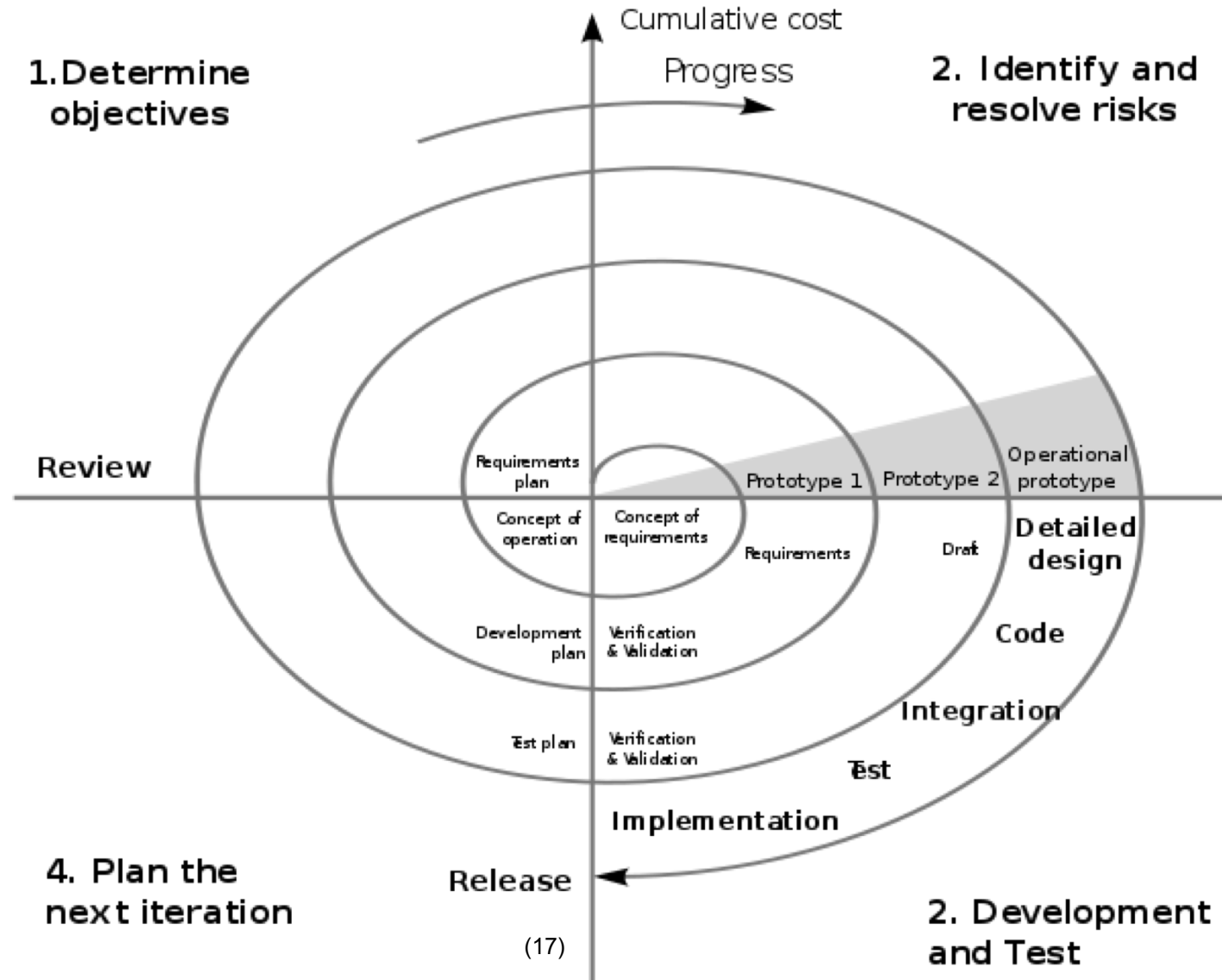
Waterfall vs. Spiral Methods of Development
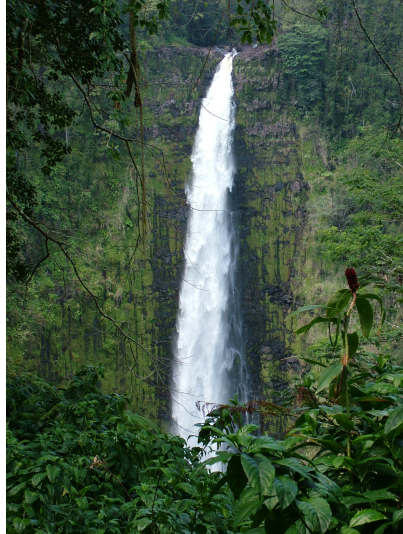
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- Waterfall means plan everything out, documenting carefully, then build

- 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

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Agile Software – Key Concepts

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

A Great Seminar on Ultra-Agile

- **By my colleague, Professor Michael Stumm**
  - Co-founder of two companies, including **Oanda**

- **"How Facebook Software is Made"**
  - **https://youtu.be/CmcE1pvfWHc**

- **Given in 1st year programming class 'plenary' lecture**
  - Several years ago
  - I have pointed CEOs of companies to it
  - Agile approach presented in the extreme

Spiral Method of Development

- To emphasize how important this is, the key milestone after the proposal/plan next week is called "**Spiral 2**"

- **Spiral 1** is what you plan to get working end of week on Feb 24

  – You should describe what this will be in your proposal/plan presentation next week – functionality and features achieved; you're **not** presenting this.

- **Spiral 2** is what works by March 10

  – a complete set of (additional to Spiral 1) features and functions

  – You **are** presenting this!

Week	Date	What
1	Feb 24	Spiral 1
2	March 10	**Spiral 2**
3	March 17	Spiral 3
4	March 24	**Spiral 4**
5	March 31	Spiral 5
6	April 7	**Final**
7	April 14	**Final**

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You'll Present Spiral 2 on March 10

- **March 10 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
  - You will include your projections/plan for Spiral 1 and Spiral 2 in the proposal/plan you **present** next week

- **The specialist assignment, S4, will be helping the whole group think about this.**

Assignment S4

Estimates and Trade-offs in Your Project

- For specialists, but programmers also involved

Assignment S4

- **Goals:**
  - Refine your project features
  - Estimate how long they will take
  - What risks they involve
  - Compare time required to time available

- **First: pick the top three features of your App**
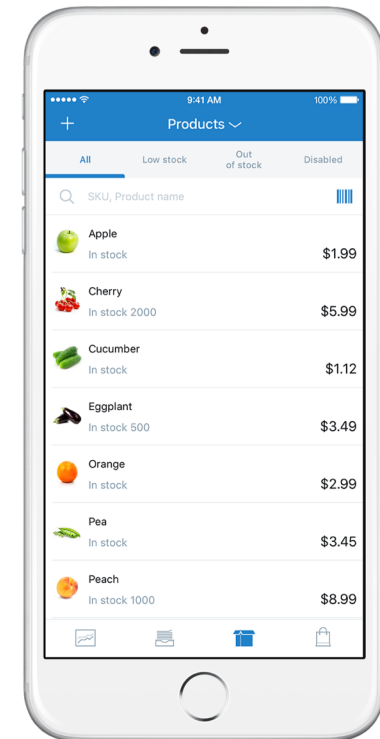 - 1
  - 2
  - 3

Next: Break in Pieces & Estimate Time

- **Break features down into sub-features**
  - What is a sub-feature?
  - e.g. **Feature:** list of fruits to buy
  - Possible Sub-features:
    - order list by price
    - order list by location
    - Products on sale highlighted

- **Draw them in Marvel –** www.marvelapp.com

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Next: Estimate Time to Build

■ Estimate how long sub-features will take to build
  – **Must consult/discuss with programmers**
  – Put in <u>margin</u> for error

■ Add up to get time for feature

Next: Estimate Available Time

- **Look** at schedule
  - Time remaining to Spiral 2
  - Time to Spiral 4
  - Time to final presentation
- **Discuss**, with programmers how much working time is actually available!

Time Required <= Time Available?

- **Add up pieces of estimated work -> Time Required**
  - For Spiral 2, 4, Final
- **Add up pieces of time -> Time available**
  - For Spiral 2, 4, Final

- **Is there enough time to do what you want?**
  - If not, revise goals, features

- **Do roughly for whole project**
  - Focus on Spiral 2

Also: Assess Risk

- **What could go wrong, for example:**
  - Need too much data
  - 3rd part software reliability/comprehension
  - Complex processing algorithms to write

Project Planning and Work

Key Coming Steps in Project

1. **Identify a Spiral 1 and Spiral 2**
   - Take your block diagrams, and break down into tasks
   - 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
   - **This has often been done poorly in the past!**

2. For 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 and deadlines to Each Team Member
   - Record them on Github

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
  - Explicitly, in writing on Github (wiki)

- Have weekly or more frequent meeting; every 3 days?
  - Easier to meet these days with Zoom & other methods

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 task 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 or disagreement:

1. Specific issues that give rise to a problem
   - differences of opinion on strategy
   - different view of facts/different facts

2. Relationship between people
   - Trust, respect

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

Proposal/Plan Presentations

Next Week in **two times** February 17th

Wednesday Morning, 10am-12 (usual)

Wednesday Evening 6-8pm

On usual Zoom link

Plan Presentations on February 17th

- Formal Presentation
  - Using PowerPoint (preferred), Keynote, PDF
- Morning (usual), Evening 6-8pm
- You will have to attend both lectures, because you'll either be presenting, or doing a **peer review**
  - Unless you express a **hard** constraint to me, that you cannot attend one of these; must be sent to me by this Friday
- One member of group should submit the presentation to Quercus: "Project Proposal/Plan Presentation"
- **Due Tuesday February 16 at 6pm**
  - 0.5 marks off for each hour late.

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**

- Five Minutes for Questions/Discussions

Proposal/Plan Presentation Contents

- Similar (*but not same*) as written Proposal/Plan doc
- **Use this Outline:**

1. Goal (What & Why)
2. Mock-ups (pictures) of What User Will See
3. Top-level Block Diagram of Code briefly explained
4. Statement of Risks/Issues
5. **Spiral 1 and 2 targets -> Different from proposal**
6. Specialist Statement
   - 1 minute, for Specialist to say 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

Questions:
- How many slides can there be in 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 jargon have in a short presentation?
  - What is Jargon?

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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 Computer Engineering and Science

Peer Review

Feedback for Others

Critical Thinking for You

Class Presentations

- A key part of what happens in this course is the contribution you make to other's projects

- You will do many presentations in this class
  - Indeed, one side-effect of this project course is some real practice in giving high-quality, concise & clear communication
  - Most presentations will be 5-6 minutes in length
  - Must be geared so that most people in the class will understand

Peer Review

- Want everyone to come, listen & provide useful input
- Expectation that you'll listen and provide thoughtful feedback and suggestions to other's presentations

Specific Course Deliverable:

- For each of Proposal, Spiral 2, and Spiral 4 you'll be asked to write a review for one other group;
  - these will be graded
- Means you'll need to be here for every lecture, not just when you're presenting.

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Assignment of Group to Review

- On Monday February 15, you will be able to see what your peer review assignment is on Quercus
  - In Assignment "Peer Review for Proposal/Plan Presentations"
  - You won't be reviewing in the same 2 hour slot that you're presenting
  - Will also be able to see the presentation slides

Peer Review for Proposal

Short answer questions, Due Friday Feb 19th @6pm.

- Late penalty -0.5 marks for every hour late
- Hand in under Peer review
- Will be anonymous; don't identify yourself in writing

Briefly answer these four questions

1. State the goal of the project in your own words
2. Which parts of the proposal did you understand, and what parts could be more clear? Why?
3. What was the best thing about the project proposed?
4. What one thing could be improved the most? How?

Feature Discussions

From Specialist Assignment S3

Discussion

- **Would like to review the goals and features submitted as part of S3**
  - To help all of you with your planning & execution

- **Will ask specialists to discuss, with help from programmers as necessary**

Current Project Names

Tootti	Present Better
Track-a-mole	Dynasway: Concussion
Interview log	NWTO
Protosight	U Health
CalmMind	Paxifist
Ready	Flexinome
iPhasia	ParkinSense
Re:Food	Lightbulb
Chordable	Crypto-Guardian
IllumiSmart	ShopAware