Pragmatic Programmer Tip: Care about Your Craft

Why spend your life developing software unless you care about doing it well?
Cray Inc. – Supercomputer Performance

3D Seismic Earthquake models – PSC
Combustion Models – SNL

Understanding climate change sometimes requires the world’s most powerful open science computer.

With more than 100 trillion calculations per second, it’s not a problem.

http://computing.ornl.gov/psi3
Red Storm system

- Massively parallel processing supercomputer system used for analysis and stewardship of nuclear weapons - for Sandia National Lab $93M
From XT3 to XT4

- Red Storm was made into a product, Cray XT3
- Full delivery was 3 ½+ years, but got something to the customer in 3. It was a sprint the whole way, and the team felt it
- Software effort was much more complex than expected
- Rearchitected at least two major SW components after getting experience with them

XT3 product was successful and evolved into a product line, the XT series. Yah!
Today’s outline

- Course overview
- Assignment 1 – Product proposals
- Lifecycles

Week readings

- **Lifecycle**: Computerworld article, SG54-59, Agile article
So what IS software engineering?

From Sp08 students:

• Creating a product that solves a problem, to the satisfaction of a customer
• Within a deadline/constraints (time, money, scope)
• Writing software with a constraint/requirements (ie. Performance)
• Using a repeatable, predictable process
• Requires breaking down the project into scheduleable pieces
• Considers upgrades during development
• Teamwork!
So what IS software engineering?

Software engineering involves:

- Processes necessary to turn a concept into a robust deliverable that can evolve over time
- Working with limited time and resources
- Satisfying a customer
- Managing risk
- Teamwork and communication
Projects are a balance of three dimensions, with the goal of producing a successful deliverable.
A typical 403 week

1. **Class sessions** to discuss best practices
2. **Sections** to dig deeper and/or discuss pragmatics and tools
3. **Readings and assignments** to reinforce the information
4. **Group project** to enable you to have direct experience with the material we’re covering
   - You’ll meet *technical challenges* given the larger project
   - You’ll meet *social challenges* given the team effort
A typical 403 week

Interaction and discussion is encouraged!
A typical 403 week

Interaction and discussion is encouraged!

Please, no laptops unless for a class exercise.
Readings and summaries

Each week:

- Will have a set of required readings associated with it
- Will have a reading summary of one topic assigned

**Computerworld article + SG54-59 due Fri in class**

Reading summary assignments:

1. Paragraph containing the main idea/main points
2. Paragraph about how this material relates to 403
3. Paragraph of your own analysis of the paper

1/2 - 2/3 page total
The Project

- You make product proposals - this Thurs/Fri
  - And then vote on which products to “fund”
- You’re divided into project teams of 6-8 students
  - We choose the teams, to mimic the real world
  - Larger teams, larger projects, like industry
- You develop your deliverable in stages
  - Reflects modern methodologies for effective software project development
- Another team will act as your customer
  - Ultimately, a project will survive only if it satisfies its customer
Project culture

- This is a real project
  - We expect you to work to build a real system
  - To be used by real people

- Take responsibility
  - Take initiative
  - Find and solve problems yourselves
  - Coding is only part of the job
  - Good planning and design, hitting your market, and working well with your team, are all needed for success
SuiteRates project example
Titan Robotics Club Mailing Lists

- **Assembly**
- **IPF**
- **RoboticsCamp**
- **TRC-492**
- **TRC-alumni**
- **TRC-announce**
- **TRC-coaches**
- **TRC-CodeDump**
- **TRC-exec**
- **TRC-FLL**
- **TRC-fundraising**

- List to coordinate Puget Sound area Joint Practice Field for the FIRST Robotics Competition.
- This is the email list for any robotics members interested in organizing and/or running a robotics summer camp.
- A high-volume list for members of the Titan Robotics Club.
- For TRC alumni who wish to play a small role in club activities.
- TRC General Club Announcements.
- For coaches of the TRC FIRST Lego League teams.
- Place to dump the latest robot code.
- For the TRC Executive Officers.
- For Parents and Students involved in the TRC’s FLL program.
- A mailing list for discussing and implementing fundraising plans.
Introduction

Collaboration, literally, consists of working together with one or more other people.

Although the word collaboration is widely used in many varying contexts such as education, science, art and business, very little research has been carried out to determine the properties of this process. With the relatively recent advent of long-term, multi-participant, long-distance collaboration tools, and research in collaboration is being widely utilized in many diverse fields to create more useful and effective collaborative environments and methods, more light is shown on this ubiquitous and taken-for-granted practice. However, what light is being cast is still fairly refracted into the diverse fields in which the research is being carried out. Perhaps more collaboration into the nature of collaboration will be required to answer such questions as:

- How does collaboration differ from cooperation? (note definitions are generally more or less equivalent)
- What qualifies as a collaboration? Is Wikipedia a collaboration in the same way that a work of art is when two artists collaborate face-to-face? and for that matter, does it matter, does it matter? Is a notion of quality still valid?
- What are the defining principal or elements of this process? (understanding these might help to draw conclusions on the previous questions)

Currently there exists no unifying general theory of collaboration.

Etymology

Dating from 1871, collaboration is a back-formation from collaborateur (1802), from the French collaborateur, ultimately from the Latin collaborare, past participle of collaborare ("work with", itself derived from com- ("with") and laborare ("to work").

Nuances

"Collaborate" implies "to work together on a project". When individuals work together as in an academic setting, "collaborate" includes the "to be jointly accredited" for the work completed. When individuals or organizations work together, or organizations with other organizations, nuances include "usually but not necessarily willingly" and "with another organization with which one is not normally connected".
Assignment 1 - Proposals

Your chance to turn a great idea into a product!

- Constraints
  - Client/server networked architecture
  - Installable/runnable on lab machines
  - Not a game
Assignment 1 - Proposals

- Prepare a 3 slide, 3 min pitch with 1-2 others
  - Operational concepts
  - Software architecture
  - Challenges and risks

- Turn in Thurs 4/3, noon and present on 4/3, 4/4

- Vote by Friday 4/4 by 10pm
Assignment 1 - Proposals

- Prepare a 3 slide, 3 min pitch with 1-2 others
  - Operational concepts

  Pragmatic Programmer Tip:
  It’s Both What You Say and the Way You Say It
  
  There’s no point in having great ideas if you don’t communicate them effectively

- Vote by Friday 4/4 by 10pm
# Back to the overview … grading

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<td>Software Design and Planning (10)</td>
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<tr>
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<td>Reading Summaries and Assignments</td>
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<tr>
<td>20%</td>
<td>Final Exam</td>
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Your scores on group related work may be adjusted, based on your contribution. Peer evaluations will occur ~3 times in the quarter.
Class website

www.cs.washington.edu/education/courses/403/08sp/index.html

The “Calendar” link will be especially useful to you
Goals of 403

From students:
Goals of 403

- Be exposed to some of the best software development practices in use today
- Learn how to more effectively collaborate with others toward a common goal
- Understand how software is produced – from conception to shipping and subsequent maintenance
- Develop skills to articulate your ideas and progress
- Understand the issues and tradeoffs involved in making decisions as software engineers and project managers
Input break

- What do you believe will be the biggest challenge of the course?
- How might you (we) address it?