Compsci 108

- **Object oriented design and programming of medium-sized projects in groups using modern tools and practices in meaningful ways (*written Spring, 2004*)**

- **High level OO concepts**
  - ➢ **XP: Extreme Programming: simplicity, refactor, grow code**
  - ➢ **Tell, don't ask: designing classes**
  - ➢ **Open/Closed: open to extension, closed to modification**

- **Learn to manage time, improve coding methods, e.g., can you really code effectively at 3:00 am?**

Essential Design Patterns (by name)

- **MVC, aka Observer/Observable**
  - ➢ **Separate concerns, especially important for GUIs**
- **Composite**
  - ➢ **Container is/contains JComponent: File/Directory**
- **Factory**
  - ➢ **Separate creation from class, install new creators**
- **Proxy/Adapter**
  - ➢ **Stand-in with same interface, adapt interface as needed**
- **Decorator**
  - ➢ **Is-a and Has-a, e.g., Filters and java I/O**
- **Command**
  - ➢ **Function/request object, undoable action**

Patterns continued

- **Singleton**
  - ➤ **Enforce single point of creation, conserve resources**
- **Template method**
  - ➤ **Hooks filled in by sublcasses**
- **Iterator**
  - ➤ **Common from previous courses, essential in Java**
- **Strategy**
  - ➤ **Human player, AI, change algorithm**

- **Forces in a problem lead to solution via appropriate pattern**
  - ➤ **Should know what GOF is: gang of four**

Something old, something new

- **Compsci 108 has used Java since 1996 always with C++**
  - ➤ Before '96 used Tcl/Tk once and Python once
  - ➤ In Fall '04 CPS 6/100 moved to Java, consequences?
  - ➤ What is the purpose of Compsci 108?

- **Is Unix an issue? Command-line? What about all Eclipse?**
  - ➤ Do we need to use/understand the command line?
  - ➤ C++, Makefiles, …?

- **What about groups?**
  - ➤ 110 model, keep same group always
  - ➤ 108 model, chaotic? Re-randomize? Always choice?

Alan Kay, winner of 2004 Turing Award

- **Alto, Smalltalk, Squeak, Object-Oriented Programming**

  "Don't worry about what anybody else is going to do... The best way to predict the future is to invent it. Really smart people with reasonable funding can do just about anything that doesn't violate too many of Newton's Laws!"

Alan Kay on Education and OO

- "By the time I got to school, I had already read a couple hundred books. I knew in the first grade that they were lying to me because I had already been exposed to other points of view. School is basically about one point of view -- the one the teacher has or the textbooks have. They don't like the idea of having different points of view, so it was a battle. Of course I would pipe up with my five-year-old voice."

- Java and C++ make you think that the new ideas are like the old ones. Java is the most distressing thing to hit computing since MS-DOS.

- I invented the term "Object-Oriented", and I can tell you I did not have C++ in mind.

Compsci 108

- **Learn how to read**
- **Learn how to invent your own standards**
- **Learn to work in a group**
- **Learn about issues in developing programs and code**
- **Learn about design methodologies like XP**

- **Should Compsci 108 be a writing course?**
  - ➢ **Don't you write code?**
  - ➢ **Don't you revise code?**
  - ➢ **Is this what the writing requirement is about?**
  - ➢ **What about writing "in the discipline?**

Evaluation

- **Nanogoogle**
  - ➢ Started very well, revisions ok
  - ➢ Didn't review work, analyze as much as could have been possible
- **ExplorerTools**
  - ➢ Browser good, but where was the rest of the explorer stuff?
  - ➢ Again, post-project analysis weak
- **Freecell**
  - ➢ Text-based version to GUI version seemed to work from my perspective, GUI-sharing???
- **C++**
  - ➢ Disappointing, should have had bigger project?

Evaluation continued

- **Markov exam/project**
  - ➢ **I'll tell you more when I'm done with it, seemed to go well form a 30,000 foot view**

- **Readings**
  - ➢ **Started well, sputtered**
  - ➢ **HFDP?**

- **Code examples**
  - ➢ **Need to have groups do code walkthroughs to class**
  - ➢ **Going over code in class?**
  - ➢ **Refactoring projects for all code discussed?**

Future of Compsci 108

- **Start with Java, end with C++? No C++? All C++?**
  - ➢ **Where does C and C++ programming go**

- **Use Java, concentrate on web programming?**
  - ➢ **PHP? Other alternatives?**

- **Where does it fit in Compsci/Engineering/Bioinformatics?**
  - ➢ **Should we be concerned about these?**

- **Followup courses?**
  - ➢ **109? Mentor?**