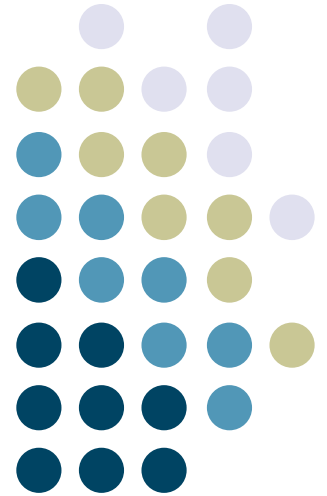
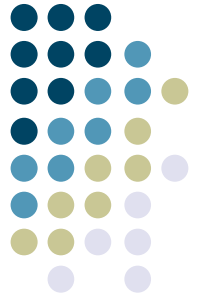


CS4470: Intro to UI Software
CS6456: Principles of UI Software

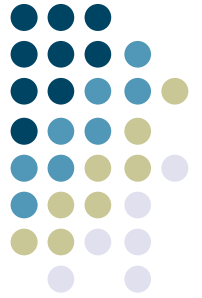


Keith Edwards



Today's Agenda

- Introductions
 - Me
 - TAs
 - You
- Class Overview
 - Syllabus
 - Resources
 - Class Policies



Introductions

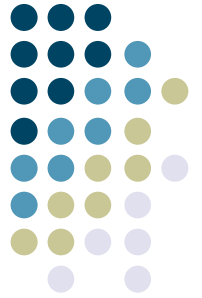
- Instructor
 - Keith Edwards
 - TSRB 213
 - good: keith@cc.gatech.edu
 - bad: 404-385-6783
- My research areas:
 - Technical side of HCI
 - UI infrastructures, new interaction techniques
 - Ubicomp
 - Making security, networking more usable

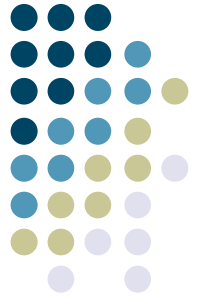


Introductions

- TA

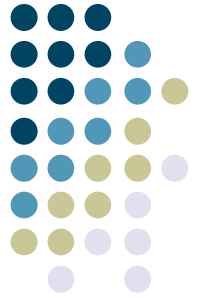
Georgia
Tech





Now, It's Your Turn

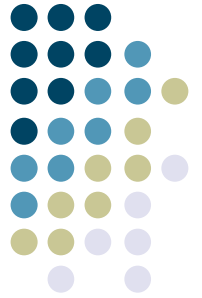
- Name (pronunciation if non-obvious)
- Major, Year
- Interests
- Why UI SW?



What is this class about?

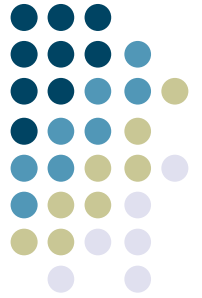
- Organizing principles of UI software
- Practice in UI implementation (lots)

- First half of the semester: Basics of traditional 2-dimensional GUIs
- Second half of the semester: Advanced topics (animation, gestures, recognizers, audio, etc.)



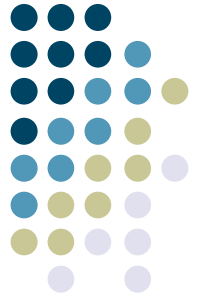
What this class is NOT about

- User-centered design
 - That's what 3750/6750 are for!



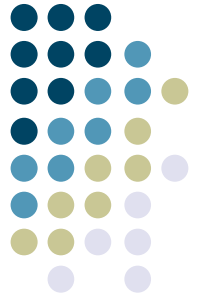
Basic Course Info

- “Prerequisite”: CS3750/6750
 - Remedial background texts:
 - “Human-Computer Interaction,” Dix, Finlay, Abowd, Beale
 - “The Design of Everyday Things,” Norman
- Web materials
 - Up now:
 - See CoC website for link (or www.kedwards.com)
 - General info (books/readings, exams, homework)
 - Syllabus
 - Will be updated throughout the semester
 - Will contain links to lecture slides



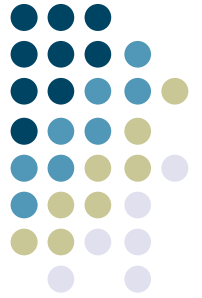
Resources

- Recommended:
 - *Java Swing, Second Edition*
 - Loy, Eckstein, Wood, Elliott, Cole
 - O'Reilly Associates
 - Helpful for the Swing-based programming assignments
- Recommended and Free!
 - Java AWT Reference
 - Zukowski
 - O'Reilly Associates
 - Somewhat out-of-date, but downloadable!
 - <http://www.oreilly.com/catalog/javawt/book/index.html>
 - AWT is the layer “underneath” Swing



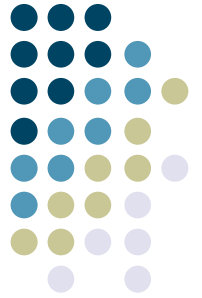
Grading Criteria

- Different criteria for undergrad versus grad
- Undergrads:
 - 5 individual homework assignments
- Grads:
 - Do the **first two** individual homework assignments
 - Research project -- two person teams
 - Writing, implementation, presentation
- Everyone:
 - Midterm and final exam
- See syllabus for grading breakdown



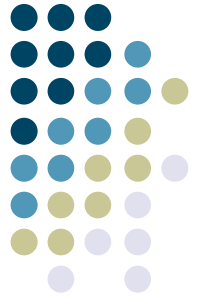
Other Policies

- **Homework** assignments are in Java
 - Java use is required
 - Turnin and late policy:
 - Due 11:55PM on the announced due date
 - Late turnins will be marked down 10% for each date they are late, maximum of three days
- Grad **Project** work is more flexible
 - You will choose programming environment
 - Multiple milestones involving written paper, implementation task, presentation and demo
- What you turn in must compile and run!
- Please pay attention to platform issues (hard-coded filenames, e.g.)



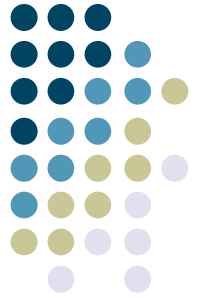
Important Note

- There will be minimal Java training in class
- If you are not comfortable with Java programming:
 1. Learn
 2. Drop course
- While examples and programming assignments are in Swing, focus of the lectures is on broader UI software concepts
 - You'll have to understand how these concepts are applied in Swing
 - I can help with a lot of this, but Swing is huge and you may encounter Swing features/bugs that I am unaware of
 - Be prepared to do independent problem solving if necessary



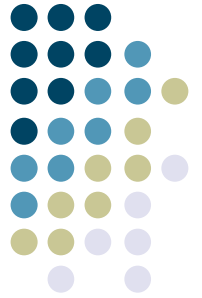
GT Honor Code

- All homeworks are expected to be completed by individuals and not in collaboration with others. While you can ask others about Swing coding problems, no code sharing is allowed.
- Grad projects are done in teams of two; be clear about what code you wrote and what code you are reusing (if you're using external libraries, etc.)
- Obviously, all exams are to be completed by the student alone.
- Students are expected to follow the GT Honor Code. I am required to forward all suspected cases of academic misconduct to the Dean of Students, where they will be pursued to resolution.
- This is a very unpleasant experience for all involved, so please do not put us in this situation.



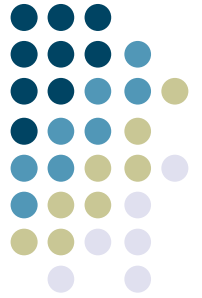
Motivation

- Moore's Law has done its job...
- No longer: "Can you build it?"
- Now: "Can they use it?"
- Follow-on: "Will they use it?" → "Can I sell it?"
- Shift toward "usability" (broadly defined) as a key product differentiator
 - Good user experience design
 - Good visual design
 - Good physical/industrial design
 - Think: iPod, iPhone



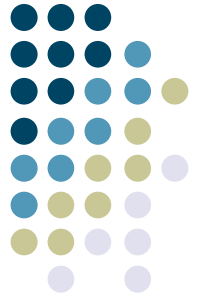
Why a class on UI software?

- Most systems are built for a user
- Good user interfaces are critical for software survival and economics
- Designing for users is *important* and *difficult*
 - Lots of code devoted to UI
 - Hard to get right the first time (iteration necessary)



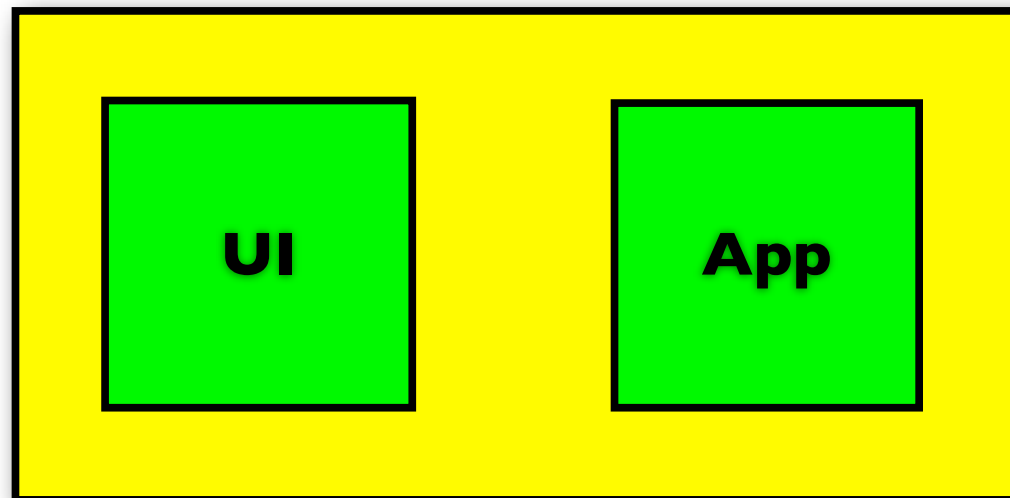
What's the User Interface?

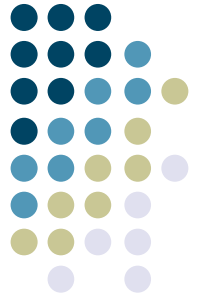
- Since mid-40's
 - Display (paper terminal, CRT, LCD, ...)
 - Keyboard
- Since late '60's
 - Pointing device
 - WIMP/GUI style of interaction
- Since early '90's
 - An extension of our physical environment
 - Sensing, inferencing



Programmer's Perspective

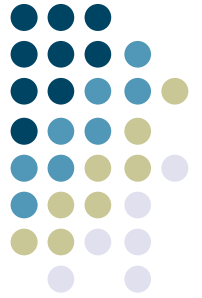
- The “UI” is typically viewed as one component of the overall system
 - The part that “deals with the user”
 - Separate from the “functional core” (AKA the “application”)





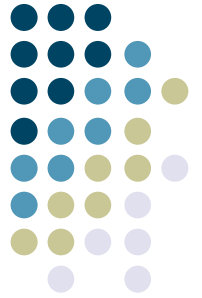
Software Engineering and the UI

- Advantages of “separation of concerns”
 - Keep UI code separate from app code
 - Isolate changes
 - More modular implementation
 - Different expertise needed
 - Don’t want to iterate the whole thing

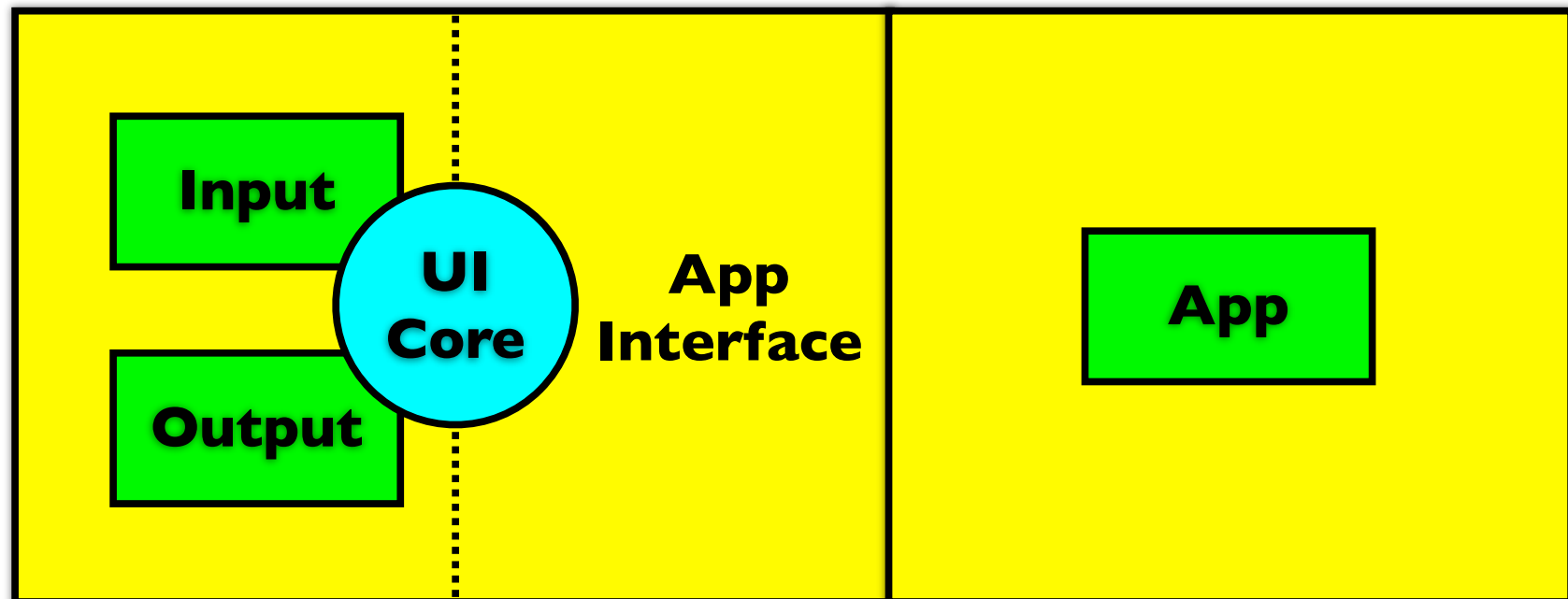


In practice, very hard to do...

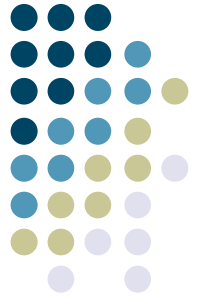
- More and more interactive programs are tightly coupled to the UI
 - Programs structured around UI concepts/flow
 - UI structure “sneaks into” application
- Not always bad...
 - Tight coupling can offer better feedback/performance



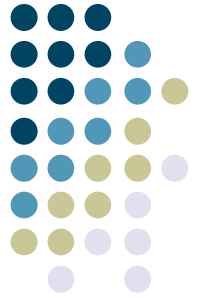
Conceptual Overview of the UI



Part I: Understanding Traditional GUIs



- UI software architecture and organization
- Input and output
 - Devices, software abstractions
- Interaction techniques and how to implement them
- Toolkits and programming environments



Part II: Advanced Topics

- Multiscale input and output
 - Large surfaces, handheld or wearable devices
- Multitouch (two-handed) input
- Zoomable interfaces
- Animation
- Natural interaction types
 - Ink, audio, video
- Sensing-based interfaces
 - Recognition, context awareness
- Paper-based interfaces

- Requests?