CS6452 Fall 2013

Prototyping Interactive Systems

This class is an introduction to computing for HCC graduate students with non-technical backgrounds, with a focus on ensuring you can understand how software works, how to create working interactive prototypes of your ideas, and how to communicate with a software team about software. Students will be exposed to various software architecture considerations and tradeoffs.

For our HCC PhD program, this class is designed to provide a foundation for students to meet their computational portfolio requirements, including reading, writing, doing and talking about technical ideas and issues.

The course title has might be somewhat misleading. This is **not** a class about using prototyping tools (e.g., Flash). It is **not** a class about evaluating prototypes, and it is **not** a class for technical students interesting in designing and building interacting prototypes (we have other HCI classes for these topics). Instead, this is a class about the *rapid creation of interactive systems through programming*, with an emphasis on scripting languages and common technical idioms that are useful across a breadth of CS.

This class covers both theory and practice of pragmatic systems building as well as skills in describing/arguing/defending your design choices.

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Syllabus

Details: Meets Monday 9-12, CCB 52

Instructor: Blair MacIntyre, blair (AT) cc (dot) gatech (dot) edu, TSRB 231; Office Hours M.

Mentor 1: TBA **Mentor 2:** TBA

Grading and Class Policies

Project. (50% of overall grade) This will be a substantial software implementation project, delivered in multiple "modules" throughout the semester. This will be an individual effort (no teams). Talk to the TA or instructor if you have questions, but you are required to work individually on your programs. Unless otherwise specified, each project turnin is due at 11:59PM on the evening of the announced due date.

Homework. (30%) We will have some number of written assignments, ranging from code explanation (learning to talk about code) to reading reviews.

Reading Discussions. (10%) When we have reading discussions, I expect everyone to participate, and at least five people each time to propose "interesting" quotes from the readings.

Presentations. (10%) Everyone is responsible for doing one short in-class presentation during the course of the semester to describe some aspect of their project (novel design choice; overcoming some debugging problem; etc.)

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Collaboration

All of the work in this class, except where otherwise noted, is individual work. Each homework or assignment will identify if it is group work.

However, this does not mean you should work in isolation. Asking for help with programming issues, suggestions for how to accomplish certain things, and so on is fine, as long as the project/prototype you create is yours. For example, you can get a pointer on how to implement something, but you should then do the implementation in your project.

If you get code from somewhere, either a tutorial, web page or forum, you are allowed to include it as long as you document what you got where. The assignments should have a significant element of your work; it is not acceptable to get a working prototype from somewhere and modify it slightly and turn it in. The goal of the class is to help YOU learn to build prototypes and to demonstrate that you have learned how to create a working program.

If in doubt, ask.

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Schedule

Below is a schedule for the class. I expect it will change slightly as the semester progresses. We will update this page as the schedule changes, and post to blog about the changes.

DATE	NOTES	TOPIC
Aug 19		Introduction (Slides: week1) ■ Course goals, structure, and context ■ Prototyping defined ■ Kinds of prototyping (lo-fi, hi-fi) ■ Practicum: setting up the development environment Assignments: ■ **Project Phase 0: Lo-fi prototype.** Due next class
		Jython Refresher (prelude to Asynchronous Programming)

		■ Jython syntax ■ Scoping rules ■ Collections, Classes, and Modules ■ Accessing Swing from Jython Other stuff: ■ Swing Sampler code ■ Mike's great page on translating from JavaDoc to Jython (also as PDF) Assignments: ■ **Project Phase 0: Lo-fi prototype.** Due in class today. ■ **Project Phase 1: GUI module**. Grading Criteria Here
Aug 26		
Sep 2	LABOR DAY	
		Asynchronous Programming ■ Understanding asynchrony ■ Event-based pro-

		gramming ■ Combining event-based and O-O techniques
Sep 9	Readings (summary due next week): ■ ConNexus to Awarenes: Extending Awareness to Mobile Users Assignments: ■ *Continue GUI implementation*	
Sep 16	Wrap-up of Asynchronous Programming	■ Threading and locks ■ Implementing an event dispatch engine
	Assignments: ■ **Project Phase 1: GUI module.** Due Tuesday, 11:59PM	
	Distributed Applications	

Sep 23	(Networking Basics) - Networking basics - Network programming: sockets, marshalling - P2P and discovery Assignments: - **Project Phase 2: Networking module.**	
Sep 30	Distributed Applications - Exception handling - Network programming idioms - Protocol design and prototyping Assignments: - *Continue with networking project.*	
Oct 7	Distributed Applications - *Lab time in class today.* Assignments:	

- **Networking project PART I due Tuesday, 11:59PM**

Oct 14 FALL BREAK

Distributed Applications

- *Lab time in class today.*

Oct 21 Assignments:

- **Completed Networking Project due Tuesday, 11:59PM**

Web Services

- Mining intelligence
- Extracing content from the Web
- Web Services: WSDL, SOAP, etc.
- Google, Wikipedia

Oct 28

Assignments:

- **Project Phase 3: Web Services module.**

	Web Services	
Nov 4		■ *Lab time in class today.*
	Web Services	
		■ *Lab time in class today.*
Nov 11	Assignments:	■ **Project Phase 3 (Web Services module) due Friday, 11:59PM**
	Data Management	
Nov 18		■ Data management strategies ■ Databases ■ Key principles: keys, schemas, relationships ■ Designing a database schema, normalization ■ SQL overview ■ Using databases from Java/Jython

	Assignments: ■ **Project Phase 4:** Database module.
Nov 27	Data Management ■ Wrap up previous database slides *Short lecture will be followed by lab time.*
Dec 2	Data Management ■ *Lab time in class today.* Assignments: ■ **Project Phase 4 (Database module) due Tuesday at 11:59PM**
Exam Week	