Postlude

Done with CS 1110
Where to Next?
Announcements

Finishing Up

- Submit a course evaluation
  - Will get an e-mail for this
  - Part of the “participation grade” (e.g. clicker grade)
- Final, Dec 8th 2:00-4:30pm
  - Study guide is posted
- Conflict with Final Exam?
  - e.g. > 2 finals in 24 hours
  - Submit conflicts TODAY

Review Sessions

- Sunday 2-5 (Olin 155)
  - Call frames & diagramming
  - Classes, try-except
- Monday 1-4 (Olin 155)
  - Lists, recursion
  - Open question session
- Tuesday 1-4 (Olin 155)
  - Invariants, algorithms
  - Open question session

12/01/16 Future Courses
Obvious Next Step: CS 2110

- **Programming in Java**
  - Basic Java syntax
  - Static vs. Dynamic Types
  - Adv. Java Topics (e.g. Threads)
- **OO Theory**
  - More design patterns
  - Interface vs. Implementation
- **Data Structures**
  - Binary Trees
  - Linked Lists
  - Graphs

Java Specific

Language Independent

Major CS Topic
CS 2110 Immediately Opens your Options

CS 2110

CS 4620

CS 3410

CS 3152
CS 2800: The Other Important Course

- CS requires a lot of math
  - Analyzing code performance
  - Analyzing data
  - Proving code correctness
- Calculus is “wrong math”
  - Data is rarely “continuous”
  - Limited to specific uses (e.g. spatial data)
- “Grab-bag” course
  - All math needed for CS
  - Includes writing proofs
CS 2110 + CS 2880 = Even More Options

Future Courses

- CS 3110
- CS 4670
- CS 47xx
- CS 4810
Higher Level Computer Science Courses

- Programming Languages  x1xx  (e.g. 1110, 2110)
- Scientific Computing  x2xx  (e.g. 4210)
- Data Management  x3xx  (e.g. 3300, 4320)
- Systems  x4xx  (e.g. 3410, 4410)
- Computational Biology  x5xx  (e.g. 5555)
- Graphics and Vision  x6xx  (e.g. 4620)
- Artificial Intelligence  x7xx  (e.g. 4758, 4700)
- Theory  x8xx  (e.g. 4810, 4820)
- Research  x9xx  (e.g. 4999)
Higher Level Computer Science Courses

- Programming Languages \text{x1xx} (e.g. 1110, 2110)
- Scientific Computing \text{x2xx} (e.g. 4210)
- Data Management \text{x3xx} (e.g. 4320)
- Systems \text{x4xx} (e.g. 4410)
- Computational Biology \text{x5xx} (e.g. 5540)
- Graphics and Vision \text{x6xx} (e.g. 4620)
- Artificial Intelligence \text{x7xx} (e.g. 4758, 4700)
- Theory \text{x8xx} (e.g. 4810, 4820)
- Research \text{x9xx} (e.g. 4999)

Separation not perfect; there is a lot of overlap
Programming Languages

• Adv. Language Topics
  ▪ Functional languages
  ▪ Streaming languages
  ▪ Parallel programming

• Language Theory
  ▪ New languages/compilers
  ▪ Software verification

• Software Engineering
  ▪ Design patterns
  ▪ Architecture principles
Scientific Computing

- **Calculus + Computing**
  - Problems from other science domains
  - Process with computer

- **Applications**
  - Complex simulations
  - Physics (games!)

- **Challenge**: **Performance**
  - Programs can run for days!
  - How do we make faster?

12/01/16

Future Courses
Data Management

- **Modern Web Apps**
  - Storing user/session data
  - Coordinating users

- **Databases**
  - Query languages
  - Database optimization
  - Organizing your data

- **Information Retrieval**
  - Searching
  - Data analysis

12/01/16

Future Courses

CS 3300
CS 3110
CS 4300
CS 4320
CS 5300
Systems

• Building BIG software
  ▪ Operating systems
  ▪ Distributed applications (e.g. online, networked)
  ▪ Cloud computing

• Also System Security
  ▪ Though that is spread about

• Senior/masters level classes
  ▪ Bulk of the 5xxx courses
  ▪ But great project courses!

Future Courses

12/01/16
Computation Biology

- No undergrad classes
  - Too much to learn
  - Masters/PhD level
- Undergrad options
  - BTRY 4840: Comp. Genomics
  - BSCB department
- Hoping to improve…
Graphics and Vision

- **Not** modeling/art!
- **Rendering & Animation**
  - Illumination/reflection
  - Cloth/hair simulation
  - Water and fluids
- **Processing Images**
  - Recognizing shapes
  - Assembling 3D models from 2D pictures
  - Smart cameras

Future Courses
- CS 4620
- CS 4670
- CS 5625
- CS 5643
Artificial Intelligence

- **Not** sentient computers
- **Machine learning**
  - Discovering patterns
  - Making predictions
- **Natural Language Proc.**
  - Automatic translation
  - Searching text/books
  - Voice-control interfaces
- **Robotics**
  - Autonomous control

12/01/16

Future Courses

15
Theory

- **Analysis of Algorithms**
  - What is *possible*?
  - What is *feasible*?

- **Analysis of Structures**
  - Social network theory
  - Complex data structures

- **Cryptography**
  - Theory side of security

- **Perhaps the most famous group in the department**

Future Courses
- CS 4810
- CS 4820
- CS 4830
- CS 4860
What About Games?

• CS 3152, Spring only
  ▪ Prereq: CS 2110
  ▪ But CS 3110 a big help
• Build game from scratch
  ▪ Want it to be innovative
  ▪ You own the IP
• Interdisciplinary teams
  ▪ 5 to 6 people on a team
  ▪ With artists/designers
• **Final**: public showcase
What About Games?

- **CS 3152: Summer only**
  - Prereq: CS 2110
  - But CS 3110 a big help
- **Build game from scratch**
  - Want it to be innovative
  - You own the IP
- **Interdisciplinary teams**
  - 5 to 6 people on a team
  - With artists/designers
- **Final**: public showcase
Games and the Designer Track

• Coding not your thing?

• INFO 3152 (co-meets)
  ▪ Artists/designer track
  ▪ No formal training needed
  ▪ Submit me a portfolio

• Recommend: INFO 2450
  ▪ Start of the HCI sequence
  ▪ How design effects the user experience
  ▪ Fall course; no prereqs

12/01/16
Good Bye!