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 10th 2:00-4:30pm
  - Study guide is posted
- Conflict with Final Exam?
  - e.g. > 2 finals in 24 hours
  - Submit conflicts TODAY

Review Sessions

- Wednesday 1-4 (Olin 155)
  - Lists, recursion
  - Open question session
- Thursday 1-4 (Call Aud)
  - Invariants, algorithms
  - Open question session
- Friday 2-5 (Olin 155)
  - Call frames & diagramming
  - Classes, try-except
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

12/4/18

Future Courses
CS 2110 Immediately Opens your Options

- CS 2110
- CS 3410
- CS 3152
- CS 4620
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
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

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- Data Management  x3xx  (e.g. 4320)
- Systems  x4xx  (e.g. 4410)
- Computational Biology  x5xx  (e.g. 5540)
- 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)

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?
Data Management

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

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

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

Future Courses

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<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tr>
<td>CS 3300</td>
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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!
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 5625
CS 4670
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

12/4/18 Future Courses
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
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
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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
Good Bye!