Construction of User Interfaces (SE/ComS 319)

Ali Jannesari

Jinu Susan Kabala

Department of Computer Science

Iowa State University, Spring 2021

ADMINISTRATION AND CLASS INFORMATION

Outline

- Administrative stuff
  - Who I am, TAs, general information, etc.
  - Course organization and syllabus
  - Schedule and structure of this class

About me

- Instructor: Ali Jannesari (Assist. Prof. at CS department)
- My background: PhD at KIT (Germany), RWTH Aachen, Bosch Research Center, TU Darmstadt, UC Berkeley and ISU
- Research: Software engineering, systems, parallelism, deep learning/machine learning.
- Teaching: I enjoy interactive classes and discussions
- Contact me
  - jannesar@iastate.edu
  - Location: https://iastate.webex.com/meet/jannesar
  - Office hours: Tue 4:00-5:00PM
  - Emails to me regarding the class must include "319" in subject line.

About me

- Instructor: Jinu Susan Kabala (Assistant Teaching Prof)
- My background: 6+ years in software industry
- PhD in Computer Science
- Research: Internet topology. Internet performance and security. Machine learning. Stochastic processes.
- Teaching: Hands-on approach

  Contact me
  - jsusan@iastate.edu
  - Personal Room: https://iastate.webex.com/meet/jsusan
  - Office hours: Thu 5:00-6:00PM
  - Emails to me regarding the class must include "319" in subject line.

TAs

- TAs for Coms 319:
  - Hung Phan, hungphd@iastate.edu
  - Ali Tehrani Jamsaz tehrani@iastate.edu
  - Aishwarya Sarkar, asarkar1@iastate.edu
  - Suri Dipannita Sayeed, suri@iastate.edu
  - Waqwoya Abebe, wmabebe@iastate.edu
- TAs office hours
  - 1PM - 2PM Monday (https://iastate.webex.com/webappng/sites/iastate/meeting/info/e944c32b75ff4a67ad7cbceb0a70af71)
  - 11:50 AM -12:20 PM Friday (Same location with Lab Activity)

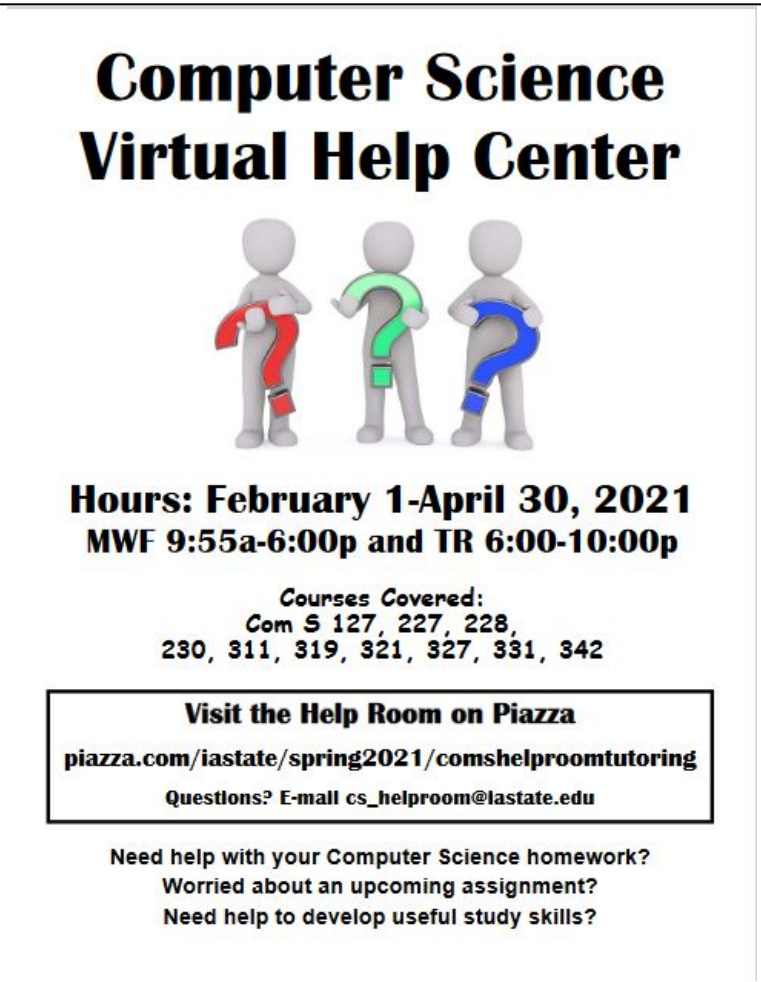
Computer Science Help Center

- Help Room for your Homework:

  MWF 9:55a-6:00p and TR 6:00-10:00p

  piazza.com/iastate/spring2021/comshelproomtutoring

  E-mail cs_helproom@iastate.edu



Your background?

- How good are you in programming?
  - Java, C/C++, Python, Web programming: HTML, JavaScript, PHP, MySQL?
- How many programs have you written?
  - Which programing languages do you use?, which IDEs?
  - How big are your programs? 100 LOC? 1k? 5k?
- How familiar are you with OO and UML?
- Are you familiar with agile software development methods (e.g. XP, Scrum, etc.)?
- Internships?
- What are your goals after graduation ?
- How will this course help you achieve your goals?

General information

- https://canvas.iastate.edu/courses/80639
- Gives you access to the course material, etc.
- Class schedule
  - Lecture:
    - Monday, Wednesday, Friday 11:00-11:00 am
  - Lab activities and project meetings:
    - Friday classes (**First session: 2/5**)
    - In case you don't have a laptop, please contact SSG (IT Support) to borrow a laptop for this term.
- Email communication must start with ”319:" in the subject line
- Prerequisite:
  - COM S 228 (Pre-Req Waiver Form)
  - Knowledge of programming (Java)

Course description

- Overview of user interface design. Evaluation and testing of user interfaces. Review of principles of object orientation, object-oriented design and analysis using UML in the context of user interface design. Design of windows, menus and commands. Developing Web and Windows-based user-interfaces. Event-driven programming. Introduction to Frameworks and APIs for the construction of user interfaces.

Course learning objectives

- Be familiar with web user Interfaces and event-driven programming (client/server, JavaScript, Node.js, frameworks and APIs.)
- Be familiar with user interface design, web and windows-based user-interfaces, JavaFX
- Be familiar with OO analysis and UML
- Be familiar with software design principles and architectural styles for UI applications.
- Be introduced to test-driven development and software testing

Course overview (tentative)

Week#	MON	Tentative Schedule
Week 1	Mon 1/25	Basics, process vs. threads, client/server programs,
Week 2	Mon 2/01	Web programming
Week 3	Mon 2/08	Event-driven programming, user interfaces
Week 4	Mon 2/15	Event-driven programming, user interfaces
Week 5	Mon 2/22	Frameworks and APIs for user interfaces
Week 6	Mon 3/01	Frameworks and APIs for user interfaces
Week 7	Mon 3/08	Introduction to Test-Driven Development (TDD) Review of Object Orientation
Week 8	Mon 3/15	System modeling and UML, UML diagrams
Week 9	Mon 3/22	Testing User Interfaces
Week 10	Mon 3/29	Design of User Interfaces
Week 11	Mon 4/05	Additional Topics: Architectural styles for UI applications
Week 12	Mon 4/12	Data Visualization
Week 13	Mon 4/19	User Experience
Week 14	Mon 4/26	Advanced Topics: Security, Ethics
Week 15	Mon 5/05	**Final Exam**

Course outcome (ABET outcome)

- **1.** An ability to analyze a complex computing problem, and to apply principles of computing and other relevant disciplines to identify solutions.
- **2.** An ability to design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- **6.** An ability to apply **computer science theory** and **software development fundamentals** to produce computing-based solutions.

What you need to do?

- Lab activities **10%**
- Quizzes **5%**
- Homework assignments **25%**
- A team project (portfolio) **40%**
  - 5% proposal; 10% final presentation/demonstration; 20% project content
  - 5% attendance and project meetings with TA and team
- Final exam **20%**

In case you are going to drop this course, do it soon please.

Quizzes

- ~10 minutes @ every few weeks (Web-based using Canvas during lecture)
- Close-book, close-note
- Cover lectures and lab activities
- 1 point for each quiz, 5% of your overall grades!

Assignments

- Homework assignments
  - Problems for you to do (individual)
  - Code and explanations (comment your code)
  - **Mandatory**
  - TBA (including report format and submission check list)
  - Selected solutions for code walk, explanation and demonstration during lab sessions (TA hours)

Group project (Portfolio)

- Do it in team (team size later!)
- Grading of group project (**40% of your grade**):
  - Individual performance assessed
- We will look for all of the below:
  - Evidence of vigorous interactions with materials (questions, insights)
  - Exploration of new and complex issues (examples, explanations)
  - Evidence of working at higher levels of blooms taxonomy: analysis, evaluation, synthesis.
  - Evidence of teamwork
- These requirements will be explained later as well.
- **Build your team as early as possible!**

Final Exam

- Final exam
  - During the **exam week**
  - 20% of your final grades

- Exams will cover material from class, labs, assignments and projects

Miscellaneous

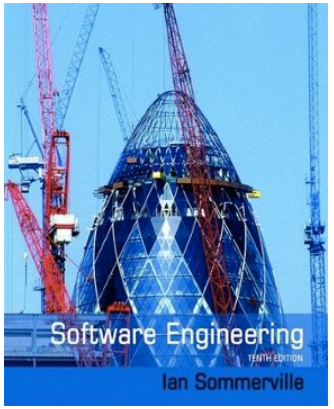
- A lecture day to be assigned for lab activities @lecture room
  - Lab activities and project meetings: Most **Friday classes (TBA);** 10% of your grade!
  - In case you don't have a laptop, please contact SSG (IT Support) to borrow a laptop for this term
- Start early, look for online materials, tutorials on web programming, JavaScript, Node.js, and Test-driven development
- In case you copy/paste any code available in public domain you need to cite it in your source code!
- Slides will be available in PDF on Canvas
  - Only for the purpose of this class. **Redistribution not permitted!**

Philosophy

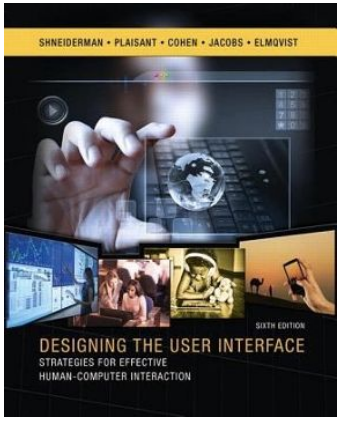
- Interactive style – physical presence strongly recommended but not monitored
- No full coverage of programming standard – rather in-depth study of key concepts
- Sound track not always mirrored on slides – please take notes or rely on books for reference

Literature & Textbooks

- Most of the materials will be based on free online textbooks/tutorials/articles.
- Optional textbooks for your references:
  - Software Engineering, Ian Sommerville, Pearson; 10th edition.



  - Designing the User Interface: Strategies for Effective Human-Computer Interaction, Shneiderman, 6th edition.



Questions?

- Thank you!