Research Methods and Analysis for User Studies

USC Viterbi School of Engineering

Syllabus

Term: Spring 2023
Units: 4
Time: 2:00-5:20 Mondays
Location: CPA261

Instructor: Dr. Gale Lucas
Office Hours: arranged by appointment only via email
Office hours location: Zoom meeting room https://usc.zoom.us/j/8697807131
Contact Info: lucas@ict.usc.edu

TA: TBD

Catalogue Course Description

Introduction to research methods and data analysis techniques for human subjects research. Topics include experimental research design, correlational/survey research, data analysis for experimental design, ensuring validity, ethics and privacy concerns.

Expanded Course Description

This course will teach computer scientists to properly design and analyze human subjects research. The course will enable students to:

- Acquire solid understanding of research methods that will enable students to design experiments and correlational research
- Determine the proper statistical analyses appropriate for testing research questions
- Understand the ethical issues that are relevant to designing experiments and correlational research

The course is intended for students in computer science, so no prior experience with user studies, research methods, or basic statistical analysis (i.e., null hypothesis significance testing) is expected. The course topics will be particularly relevant to students interested in human-computer interaction, social robotics/agents, and the like. This class will include two quizzes and a three-part project.

Learning Objectives

This course teaches computer scientists to plan and evaluate choice of experimental design and statistical analysis for user studies. The course introduces research methods and basic statistical analyses for human subjects research. Students learn to choose the appropriate experimental (or correlational) research design for their research questions, given concerns about validity and ethics. Students also learn to select the appropriate statistical tests, for each research question, given the research design adopted. The course includes practical lessons to use software for planning, analysis, etc.

Prerequisite(s): none
Co-Requisite (s): none

Readings and Software

There is no textbook. All students should obtain SPSS via https://itservices.usc.edu/stats/spss/order/.

Description and Assessment of Class Project

The class includes a project that will be developed by the students independently in 3 separate stages, getting feedback from the instructor at each stage. The due dates are listed in the Course Schedule. These assignments are due at 11:59pm on the due date and should be submitted in Blackboard. Project assignments can be accepted up to 1 week late, however, the student *must* request a late submission ahead of time, and the assignment will be graded at 20% less than the possible points for the assignment. After one week, the assignment will not be graded. Exceptions to this "one week/planned/20% less" rule will only be made with a note from a professional: for illness or family caregiving due to illness, religious observances, USC athletic event, etc..

Class Schedule

Week	Topic	Assignments
1/9	**Introduction**	**Assigned: Project part 1**
1/16	**NO CLASS**	
1/23	**Analysis: Logic and probability for statistics**	
1/30	**Analysis: Basic statistical tests**	
2/6	**User study design: Experiments**	
2/13	**User study design: Correlational research**	
2/20	**NO CLASS**	
2/27	**User study design: Validity**	
3/6	**Quiz**	**Due: Project part 1** **Assigned: Project part 2** **Quiz 1**
3/13	**SPRING BREAK – No class**	
3/20	**Analysis: Regression**	
3/27	**Analysis: Regression**	
4/3	**Analysis: Power**	
4/10	**Ethics: Protection of participants & data**	**Due: Project part 2** **Assigned: Project part 3**
4/17	**Project work – analysis of your data**	
4/24	**Final Quiz**	**Quiz 2**

Grading Breakdown

Project: There will be a three part project spread throughout the course (see description above).
Quizzes: Two quizzes will cover all of the material up to that point.

Grading Schema:

Project	50%
Quizzes:	50%
Total	100%

Grades will range from A through F. The following is the breakdown for grading:

94 - 100 = A	74 – 76.99 = C
90 – 93.99 = A-	70 – 73.99 = C-
87 – 89.99 = B+	67 – 69.99 = D+
84 – 86.99 = B	64 – 66.99 = D
80 – 83.99 = B-	60 – 63.99 = D-
77 – 79.99 =C+	59.99 and below = F

Academic Conduct and Support Systems

Honor Code

In response to recommendations made by the Academic Integrity Task Force to the Dean, the USC Viterbi School of Engineering now has an Honor Code. The Code was developed by Viterbi students, and its text is as follows:

> *Engineering enables and empowers our ambitions and is integral to our identities. In the Viterbi community, accountability is reflected in all our endeavors.*
>
> *Engineering+ Integrity.*
> *Engineering+ Responsibility.*
> *Engineering+ Community.*
> *Think good. Do better. Be great.*
>
> *These are the pillars we stand upon as we address the challenges of society and enrich lives.*

During your time here at Viterbi, please know that academic and personal resources are available to help:

- The student-driven and student-written Honor Code is here: http://viterbi.usc.edu/academics/integrity/.
- An introductory video is posted at https://myviterbi.usc.edu/ under the link "Academic Integrity Introduction" and serves as a reminder of the school's emphasis in maintaining a high level of academic integrity.
- Master's and PhD students can contact the GAPP office in OHE 106 (https://gapp.usc.edu/) for other helpful resources.
- The Viterbi Academic and Resource Center (VARC) (http://viterbi.usc.edu/students/undergrad/varc) has a variety of services available.

Academic Integrity

The Viterbi School takes academic integrity violations seriously. Most of the violations that have been reported in the past fall into four categories: unauthorized collaboration, plagiarism, code sharing, and cheating on an exam. Specifically:

- Unauthorized collaboration - Unauthorized collaboration on a project, homework or other assignment. (section 11.14.B) All quizzes must be completed individually. Students that collaborate on quizzes will be referred to the Academic Integrity Coordinator.
- Plagiarism - presenting someone else's ideas as your own, either verbatim or recast in your own words - is a serious academic offense with serious consequences.
- Code sharing - Obtaining for oneself or providing for another person a solution to problem, without the knowledge and expressed consent of the instructor. (section 11.14.A)
- Cheating in an exam - this may involve a number of violations, such as looking at class notes during the exam, looking at other student's exam, "texting" with other students during the exam. See the section titled Two Exams for a list of specific violations.

Please note that that these are only the basic violations that we have encountered in the past, and there are many more. Please familiarize yourself with the discussion of plagiarism in SCampus in Section B.11.00, Behavior Violating University Standards and Appropriate Sanctions available at https://scampus.usc.edu/b/11-00-behavior-violating-university-standards-and-appropriate-sanctions/.

All academic integrity violations will be referred to the Academic Integrity Coordinator of the Viterbi School of Engineering. The process for adjudicating these cases is available in SCampus, Part B, Section 13.

Other Misconduct

Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct/.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the Office of Equity and Diversity http://equity.usc.edu/ or to the Department of Public Safety http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us. This is important for the safety whole USC community. Another member of the university community - such as a friend, classmate, advisor, or faculty member - can help initiate the report, or can initiate the report on behalf of another person. The Center for Women and Men http://www.usc.edu/student-affairs/cwm/ provides 24/7 confidential support, and the sexual assault resource center webpage http://sarc.usc.edu describes reporting options and other resources.

Support Systems

A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the American Language Institute http://dornsife.usc.edu/ali which sponsors courses and workshops specifically for international graduate students. The Office of Disability Services and Programs http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, USC Emergency Information http://emergency.usc.edu/ will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.

Diversity

The diversity of the participants in this course is a valuable source of ideas, problem solving strategies, and engineering creativity. The instructors encourage and support the efforts of all of our students to contribute freely and enthusiastically. As members of an academic community, it is our shared responsibility to cultivate a climate where all students and individuals are valued and where both they and their ideas are treated with respect, regardless of their differences, visible or invisible.

Students with Disabilities

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. - 5:00 p.m., Monday through Friday. Website and contact information for DSP: http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html, (213) 740-0776 (Phone), (213) 740-6948 (TDD only), (213) 740-8216 (FAX), ability@usc.edu.

Emergency Preparedness/Course Continuity in a Crisis

In case of a declared emergency if travel to campus is not feasible, USC executive leadership will announce an electronic way for instructors to teach students in their residence halls or homes using a combination of Blackboard, teleconferencing, and other technologies.