Course Syllabus: CS 4/5/79995_ST Computer Haptics  
Fall 2021, CRN 21202, 20753, 20456

Course Description
This course provides an introduction to computer haptics. Topics to be covered are introduction to haptic systems, physiology of touching, touch perception, psychophysical methods, 2D/3D geometry and graphics for haptic rendering, haptic rendering, physics related to collision, collision detection & response, image based haptic rendering. In addition, how to do design/conduct user study and statistical data analysis will be discussed in the lectures. This course is organized into modules that include theory lectures and term (team or individual) projects on haptics that is practical learning with haptic devices. Haptic technology is an important part of virtual environments, game development, user interface, and physics or medical simulations.

Course Times and Location
This is a 15-week course. Please refer to the course schedule located within the course. Lectures will be delivered in a classroom through face to face teaching.

Exams and Assignments
No written exams. Only assignments (technology survey presentation and a term project) will be given for the evaluation. A team or individual term project will be given during the course. The term project includes conducting a project using knowledge learned in the class and presenting/writing a project proposal and the final report. The final grade will be determined based on the performance of the term project. Note that this course makes a distinction in the project assignment between undergraduate and graduate students (e.g., higher difficulty level of individual projects to graduate students).

Prerequisites
CS 23001 or equivalent.

Knowledge and Skills
This course is an introduction course that doesn’t require prior knowledge. However, for the term project assignment, you will develop an application or system using programming languages (C, C++, C#) on the Unity or a haptic opensource platform that allows to control a haptic device.

Course Goals
By the end of this course, you will:

1. Understand the basic principles, theories, and concepts of haptics.
2. Understand human touch perception.
3. Understand haptic systems and technologies.
4. Understand how to design user studies for haptic interface.
5. Understand how to do research in haptics.
6. Understand the implementation with a haptic engine.

Course Learning Outcomes

By the end of the course, you will be able to:
1. Build a haptic technology combining with or without computer graphics.
2. Obtaining skills and knowledge how to use haptic devices and systems.
3. Learn how to develop immersive user interfaces with haptic feedback.
4. Learn how to design psychophysical experiment and a research project, and write research proposal and paper.

Textbooks

No textbook required. Lecture materials (ppt or papers) will be regularly uploaded to the Blackboard.

References

• Technical committee on haptics: www.worldhaptics.org.

Technology Requirements and Skills

Computer Hardware and Software

Students new to Kent State University should review Information Service’s Technology Viewbook. A personal computer with consistent, reliable Internet access is required:

1. A DSL or cable connection to the Internet; dial-up is not sufficient.
2. Laptop or desktop computer with a minimum of a 2 GHz processor and 8 GB of RAM

You should have one of the following computer operating systems and additional software applications installed on your computer:

1. Windows 7 or 10 system operating software for PC computers (recommended) OR Mac 10.7 or higher for Apple Mac computers.
3. A free version of Microsoft Office is available for students. Instructions and information can be found on support.kent.edu.
4. Antivirus for Windows OS, Microsoft Security Essentials OR Antivirus for Mac OS, Sophos
5. A Blackboard Learn compatible browser, such as the latest version of Mozilla Firefox. Blackboard also supports Chrome and Safari. Internet Explorer is NOT a supported browser and should not be used.

Blackboard (Bb) Learn

This class will use Blackboard (Bb) Learn, the official learning management system (LMS) used by Kent State University to deliver course materials to university students. ALL course materials and activities will take place in Bb Learn.

In order to login to the online Bb Learn LMS, students will need a Kent State FlashLine User
Name ID and password.
• Students can login to Bb Learn either through a student FlashLine account or via a direct link to the login page: http://learn.kent.edu

For help using the Blackboard (Bb) Learn system use the “Blackboard Help” link in the main navigation. Help can also be found on the Kent State Blackboard support website: http://www2.kent.edu/is/resources/elearning/student/tutorials/index.cfm

In general, Bb Learn works best using the latest version of most major web browsers, including Firefox, Chrome and Safari. For a complete list of supported web browsers, please follow the link the to KSU Blackboard support web site: http://www2.kent.edu/is/resources/elearning/student/gettingstarted/index.cfm

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**Policies and Expectations**

**Communication Policy**

1. Email course questions and personal concerns, including grading questions, to me privately using your@kent.edu email.

2. Email will be checked at least twice per day Monday through Friday; Saturday and Sunday, email is checked once per day. During the week, I will respond to all emails within 24 hours; on weekends and holidays, allow up to 48 hours.

3. For questions related to University technology, please contact: 330-672-HELP for 24/7 support. Technical questions about Unity should be directed to the class discussion boards.

**University Use Of Electronic Email**

A university-assigned student e-mail account is the official university means of communication with all students at Kent State University. Students are responsible for all information sent to them via their university-assigned e-mail account. If a student chooses to forward information in their university e-mail account, he or she is responsible for all information, including attachments, sent to any other e-mail account. To stay current with university information, students are expected to check their official university e-mail account and other electronic communications on a frequent and consistent basis. Recognizing that some communications may be time-critical, the university recommends that electronic communications be checked minimally twice a week.

**Feedback**

The instructor will provide immediate feedback on every assignment and project. Use the score on the assignment to calculate your current grade.

**Late and Make-up Work Policy**

Late assignments will not be graded unless you have arranged with the instructor to submit the assignment late (e.g. SAS).

**Final Grade**

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University Policies

Students are required to be aware of and follow all general and academic policies established by Kent State University. A list of the general academic policies is listed on the online version of the Kent State University Catalog. University policies are located in the Online Student Support Services & University Policies folder contained within the START HERE folder in your Blackboard Learn course.

Students with Disabilities
(Revised 6/01/07) University policy 3342-3-01.3 requires that students with disabilities be provided reasonable accommodations to ensure their equal access to course content. If you have a documented disability and require accommodations, please contact the instructor at the beginning of the semester to make arrangements for necessary classroom adjustments. Please note, you must first verify your eligibility for these through Student Accessibility Services (SAS) (contact 330-672-3391 or visit www.kent.edu/sas for more information on registration procedures). Blackboard Learn accessibility statement:
http://blackboard.com/Platforms/Learn/Resources/Accessibility/WebCT-Accessibility.aspx

Course Enrollment and Withdrawal
https://www.kent.edu/registrar/spring-important-dates

University policy requires all students to be officially registered in each class they are attending. Students who are not officially registered for a course by published deadlines should not be attending classes and will not receive credit or a grade for the course. Each student must confirm enrollment by checking his/her class schedule (using Student Tools in FlashLine) prior to the deadline indicated.
If registration errors are not corrected by this date and you continue to attend and participate in classes for which you are not officially enrolled, you are advised now that you will not receive a grade at the conclusion of the semester for any class in which you are not properly registered. Also, it is your responsibility to check the withdrawal dates for each semester.

**Plagiarism and Academic Integrity**
Students enrolled in the university, at all its campuses, are to perform their academic work according to standards set by faculty members, departments, schools and colleges of the university; and cheating and plagiarism constitute fraudulent misrepresentation for which no credit can be given and for which appropriate sanctions are warranted and will be applied. For more information: [http://www.kent.edu/academics/resources/plagiarism/](http://www.kent.edu/academics/resources/plagiarism/)

**Subject to Change Statement**
The syllabus and course schedule may be subject to change. Changes will be communicated via the Blackboard Learn announcement tool or lecture slides. It is the responsibility of students to check the course announcements or lecture slides.