

14:332:571 Virtual Reality Technology Spring 2024

Overview

Instructor: Dr. Yao Liu
yao.liu@rutgers.edu

Office: Room 518, CoRE Building

Class Meeting: Tuesday and Thursdays 2:00pm – 3:20pm

Location: Hill Center Room 009

Office Hours: Tuesdays 12:30pm – 1:30pm and Thursdays 3:30pm – 4:30pm

Recommended Textbooks: *Steven M. LaValle, **Virtual Reality**, Cambridge University Press, 2023.*
Available online at: <http://lavalle.pl/vr/>
*Grigore Burdea and Philippe Coiffet, **Virtual Reality Technology**, 2nd edition, 2003.*

Teaching Assistant: Mufeng Zhu (mz526@scarletmail.rutgers.edu)

Course email address: vr-spring2024@teams.rutgers.edu

Course Description

This course provides students with an understanding of the fundamentals of virtual reality systems. Topics to be covered include virtual reality (VR) input and output devices, VR engine, VR modeling, VR programming, human factors in VR, and VR applications.

Main Topics

Topic
Introduction
The geometry of virtual worlds
Visual rendering
Output devices
Motion in real and virtual worlds
Input devices
Interaction in virtual reality
Evaluating VR systems and experiences
Emerging topics in VR

Grading

The course will be graded according to the following proportions:

Item	Percentage
Class Presentation	10%
Lab Homework	25%
Term Project	25%
Exams	40%

The final letter grading is relative to the rest of the class, but cutoffs will not be higher than: $A : \geq 90$, $B^+ : [88, 90)$, $B : [80, 88)$, $C^+ : [75, 80)$, $C : [60, 75)$, $F : < 60$.

- **Class Presentation:** Students will form groups and give presentations on emerging topics of virtual reality. A list of topics and research papers will be distributed to the class. Grading will be based on the quality of slides, if the presentation is well-organized, clarity of the presentation, and if the presenters were able to properly answer questions about the topic.
- **Lab Homework:** There will be **five** lab homework assignments. Each of them is due two weeks after the corresponding lab. Students must work individually on the lab homework. Late submissions will be accepted up to two days after the due date with a penalty of 10% of the homework each day. Submissions will not be accepted two days after the due date, and a “0” grade will be assigned.

If a student misses an assignment due date due to illness or other emergency, a note should be obtained from the **Dean of Students** excusing the student from the homework. No email requests by the student will be accepted.

Disputes to any grading must be resolved with the TA or the instructor **within one week** after the score is released to students.

- **Term Project:** The term project is a group project. Each group is expected to submit a project proposal, a project mid-term report, the project repository, a project final report, and a presentation video. Each component of the term project has its own due dates. For each component, late submissions will lose 10% credit per day within two days after the due date. Submissions will not be accepted two days after the due date, and a “0” grade will be assigned.

If a student misses a due date due to illness or other emergency, a note should be obtained from the **Dean of Students** excusing the student from the original due date. No email requests by the student will be accepted.

Disputes to any grading must be resolved with the TA or the instructor **within one week** after the score is released to students.

- **Exams:** There will be **three** exams throughout the semester. These exams will cover disjoint material and will not be cumulative. Exact dates will be announced at least one week in advance. There will be no early exam.

If a student misses an exam due to illness or other emergency, a note should be obtained from the **Dean of Students** excusing the student from the original exam time. No email requests by the student will be accepted.

Disputes to any grading must be resolved with the TA or the instructor **within one week** after the score is released to students.

Academic Integrity Policy

Students must strictly follow the rules and guidelines laid out in the current Rutgers University [Academic Integrity Policy](#) page. Please review the documents linked on this page and make sure that you understand them.

Students are required to sign the following statement on all exams and assignments:

On my honor, I have neither received nor given any unauthorized assistance on this examination (assignment, paper, quiz, etc.).

Zero-tolerance policy against any type of academic integrity violation, including plagiarism, cheating, etc., will be enforced. An academic integrity violation will result in a “0” grade for that assignment. In addition, the violation will be reported to the Office of Student Conduct.