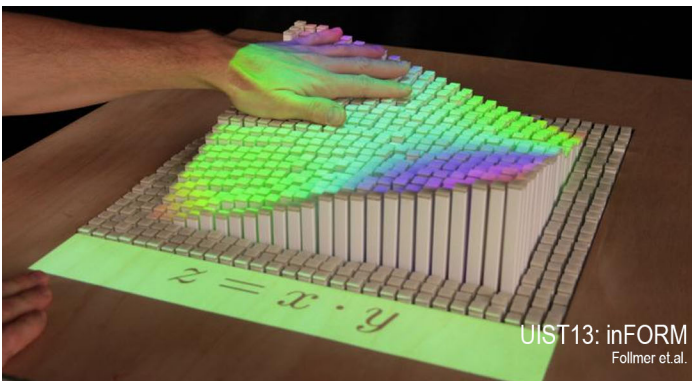




# Interactive Technologies in Human-Computer Interaction

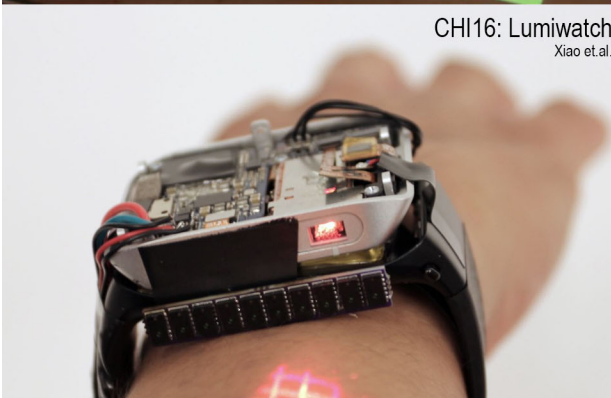
## CMSC 730 | Fall 2021 | Huaishu Peng



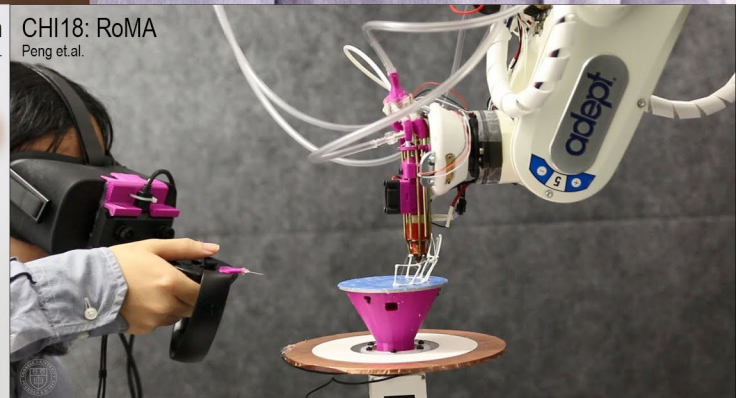
UIST13: inFORM  
Follmer et.al.



UIST16: Rovables  
Dementyev et.al.



CHI16: Lumiwatch  
Xiao et.al.



CHI18: RoMA  
Peng et.al.

## Overview

This is a graduate-level, research-oriented course that covers broad areas of interactive technology and HCI topics. The course combines reading, small labs, term project, and tests. Topics include ubiquitous and mobile computing, wearables, virtual/augmented reality, natural user interfaces, tangible UIs, interactive fabrication, and more.

After successfully completing this course you will be able to:

- Have a thorough understanding of the technologies behind cutting-edge interactive techniques.
- Learn the state-of-art topic and the recent advancement of technical HCI research and learn how to evaluate and understand its contribution.
- Gain rapid prototyping skills (including modeling, simple electronics, and fabrication) that allow you to design and build interactive devices, gadgets, and sensing systems.

## Required Resources

Course website: <http://piazza.com/umd/fall2021/cmsc730>

**Dr. Huaishu Peng**

[huaishu@cs.umd.edu](mailto:huaishu@cs.umd.edu)

### Class Meets

Monday & Wednesday  
3:30pm – 4:45am  
CSI 3120

### Office Hours

Wed 2 – 3 pm  
and by appointment  
IRB 4206 or Zoom  
<https://umd.zoom.us/my/huaishu>

### TA

Zeyu Yan  
[zeyuy@umd.edu](mailto:zeyuy@umd.edu)

### Prerequisites

N/A

### Course Communication

Course related material will be posted on ELMS before or right after the class. You are welcome to directly email me to discuss questions, absences, or accommodations. You can discuss course related info on Piazza.

## Campus Policies

It is our shared responsibility to know and abide by the University of Maryland's policies that relate to all courses, which include topics like:

- Academic integrity
- Student and instructor conduct
- Accessibility and accommodations
- Attendance and excused absences
- Grades and appeals
- Copyright and intellectual property

Please visit <https://president.umd.edu/administration/policies/section-iii-academic-affairs/iii-120a> and follow up with me if you have questions.

## Mask Requirements

President Pines provided clear expectations to the University about the wearing of masks for students, faculty, and staff. Face coverings over the nose and mouth are required while you are indoors at all times. There are no exceptions when it comes to classrooms, laboratories, and campus offices. Students not wearing a mask will be given a warning and asked to wear one, or will be asked to leave the room immediately. Students who have additional issues with the mask expectation after a first warning will be referred to the Office of Student Conduct for failure to comply with a directive of University officials.

## Activities, Learning Assessments, and Expectations for Students

Before Class: Install the **required software/toolkit** and complete all listed readings. You are responsible for keeping up with readings per the schedule in the syllabus. You are responsible for getting the required software ready and bringing the required hardware for in-class practice. You are responsible for knowing where we are in our class discussions.

Attendance: Your attendance will be part of your participation in this class. I expect students to come to all classes unless there is a university-accepted reason (e.g., illness). Much of the learning for the course and a significant amount of project work occurs in class.

- Class starts on time: Being late for class affects our learning experience. Come to class on time.
- Absences: If you have to miss a class due to an illness or similar reason, contact me before the class begins.

During Class: We will have lectures, discussions, and hands-on practice during class. Please bring a laptop (and course material, if apply) with you. You are encouraged to participate in class discussions. Your participation grade will reflect the amount of participation you contribute to course discussions and in-class activities.

Individual Project: You will work on 3 individual projects throughout this semester. The projects are to build interactive device/gadgets that can sense/response to environmental triggers and behave accordingly, but with different focuses. You will present individual projects with demo videos and/or reports.

Weekly Assignments: There will be weekly assignments, including hands-on building practice and/or reading reports that help with your learning in this course.

Final Exam: A final exam will be administered to test your understanding of the concepts and skills introduced throughout the course in class and readings.

Late Assignments: All assignments must be submitted by 11:59pm on the day they are due, unless other due time specified. The general policy in this class is that late assignments (both individual and team assignments) will be deducted 5% of its points after 11:59pm, and an additional 5% of its points each day they are late. Late assignments will be accepted according to this policy up to three days after the assignment due date. Assignments more than three days late will not be accepted. It is at the instructor's discretion to accept late work and assign late point deduction. Because the assignments of this course accumulate for the final project, it is crucial to follow the assignment schedule.

No Extra Credit Work: Students sometimes ask for some extra credit work in an attempt to bring up grades. However, extra credit work will not be given on an individual basis.

## Grades

Your grade is determined by your performance on the learning assessments in the course and is assigned individually (not curved). If earning a particular grade is important to you, please speak with me at the beginning of the semester so that I can offer some helpful suggestions for achieving your goal.

All assessment scores will be posted on the course webpage. If you would like to review any of your grades (including the exams), or have questions about how something was scored, please email me to schedule a time for us to meet in my office.

Gradings	Category Weight
<b>Assignments:</b> 2D/3D drawing, laser cutting/3D printing, circuit, etc.	20%
<b>Group Projects:</b>	
Project 1	5%
Project 2	15%
Project 3 – Paper Presentation	25%
<b>Participation</b>	5%
<b>Final Exam</b>	30%
<b>100%</b>	

## Tentative Course Schedule

Class Date			Topic and Skills
Week1	Mon	8/30	0 – Course Overview
	Wed	9/1	1 – Concept -> Multitouch
Week2	Mon	9/7–labor day	No Class
	Wed	9/8	2 – Skill -> 3D Modeling 1: Basics   Team decided
Week3	Mon	9/13	3 – Concept -> Phone interaction
	Wed	9/15	4 – Skill -> 3D Modeling 2: Assembly
Week4	Mon	9/20	Milestone 1 – Idea presentation
	Wed	9/22	5 – Skill -> Electronics: Digital IO Skill

Week5	Mon	9/27	6 – Concept ->Smart Watch Interaction
	Wed	9/29	7 – Skill -> Electronics: Analog and Sensing
Week6	Mon	10/4	8 – Concept -> Tangible Interaction
	Wed	10/6	9 – Skill -> Electronics: Servo and Ultrasonic Sensor
Week7	Mon	10/11	10 – Concept -> Display
	Wed	10/13	UIST – No class
Week8	Mon	10/18	11 – Concept -> VR
	Wed	10/20	12 – Skill -> Electronics: IMU 1 with I2C
Week9	Mon	10/25	13 – Concept -> VR and Haptic
	Wed	10/27	14 – Skill -> Electronics: IMU 2
Week10	Mon	11/1	Milestone 2 – Midterm presentation
	Wed	11/3	15 – Skill -> 3D Modeling 3: Animation
Week11	Mon	11/8	16 – Concept -> Fabrication 1
	Wed	11/10	17 – Skill -> Shift Register
Week12	Mon	11/15	18 – Concept -> Fabrication 2
	Wed	11/17	19 – Skill -> Laser Cutting
Week13	Mon	11/22	20 – Concept -> Laser cutting
	Wed	11/24– Thanksgiving	No Class
Week14	Mon	11/29	21 – How to be Creative
	Wed	12/1	Final prototype clinics
Week15	Mon	12/6	Final prototype clinics
	Wed	12/8	DEMO Day!

**Note:** This is a **tentative** schedule, and subject to change as necessary – monitor the course webpage for current deadlines. In the unlikely event of a prolonged university closing, or an extended absence from the university, adjustments to the course schedule, deadlines, and assignments will be made based on the duration of the closing and the specific dates missed.