

# User-Centered Design for Emerging Digital-Physical Environments

Visual Studies A4894 · Spring 2018

As emerging technologies such as VR/AR dissolve prior divides between the digital and physical experience, how can we draw upon interdisciplinary methods to design for the future mixed reality that is just around the corner? Through readings, discussions, and hands-on projects, this course will examine principles of human-computer interaction alongside qualitative and quantitative methods in architectural research. We will survey current technology trends and examine their implications for design and for society. Students will develop skills in user research, rapid-prototyping, usability testing, and data collection as methods for excellent interaction and spatial design.

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## INSTRUCTOR

Agnes Chang (mailto://agnes.chang@columbia.edu)

## TIME

Tues 7-9pm, Buell 200

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## COURSE OBJECTIVES

Students will...

Add user-centered design methods to their repertoire of design skills, and understand the strengths and limitations of these methods and how they can be applied to the student's own field of work.

Learn to use a variety of rapid prototyping tactics and tools (analog and digital) to prototype mixed reality experiences.

Understand technical concepts underlying mixed reality technologies, current state-of-the-art, and future challenges.

Gain familiarity with the unique interaction design needs of mixed reality experiences based on human physiology and psychology (e.g. ergonomics, sensory conflicts, gestural semantics.)

Develop a critical perspective on current and future trends in mixed reality design and their implications on society.

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## LECTURE

### JAN 16

Syllabus overview

What is mixed reality?

What is user-centered design?

(slides

([https://docs.google.com/presentation/d/1io3hJMf07Kanq\\_XnJdjd0LVU9MwMk7okeAogn9D8al/edit?](https://docs.google.com/presentation/d/1io3hJMf07Kanq_XnJdjd0LVU9MwMk7okeAogn9D8al/edit?usp=sharing)

usp=sharing))

## ASSIGNMENT

Architecture needs to interact (<https://www.domusweb.it/en/op-ed/2011/06/22/architecture-needs-to-interact.html>) Domus, 2011

Why Human-Centered Design Matters

(<https://www.wired.com/insights/2013/12/human-centered-design-matters/>) WIRED, 2013

We don't sell saddles here (<https://medium.com/@stewart/wedont-sell-saddles-here-4c59524d650d>) medium.com, 2014

The future of AR will be boring

(<https://medium.com/@warronebberster/the-future-of-augmented-reality-will-be-boring-fc95be238ef4>) medium.com, 2017

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A1.1 Four days (a1.shtml)

A1.2 De-teched (a1.shtml)

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### JAN 23

MR: current application areas

UCD: Needfinding

Assignments: teams, users, place of transaction

(slides ([https://docs.google.com/presentation/d/1RNhgJx\\_dZOZF9hv3hMULmCD\\_crnACiJwxWU-1SIS-Q0/edit?usp=sharing](https://docs.google.com/presentation/d/1RNhgJx_dZOZF9hv3hMULmCD_crnACiJwxWU-1SIS-Q0/edit?usp=sharing)))

Week 2 Readings (readings.shtml#jan23)

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A2.2 Needfinding: (a2.shtml) Plan

**LECTURE****ASSIGNMENT****JAN 30**

UCD: provocations  
(slides  
([https://docs.google.com/presentation/d/1LNBcc6FHvfGxwdWhaTdGZ4wLp7X\\_D9zZyZLAijmIgLw/edit?usp=sharing](https://docs.google.com/presentation/d/1LNBcc6FHvfGxwdWhaTdGZ4wLp7X_D9zZyZLAijmIgLw/edit?usp=sharing)))

Week 3 Readings (readings.shtml#jan30)

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A2.2 Needfinding: (a2.shtml) Observe

**FEB 6**

MR: tech interventions in physical space  
UCD: interview techniques  
(slides  
(<https://docs.google.com/presentation/d/1s4dXiQN5vKitOu2vmUbAcSSQvZKRki3Z7kAdMuwpVJ4/edit?usp=sharing>))

A2.3 Needfinding: (a2.shtml) Provocations & Synthesis

**FEB 13**

MR tech: components and capabilities  
UCD: user journeys and storyboarding

A3.1 Prototyping: (a3.shtml) Storyboard

**FEB 20**

MR usability: physiology and psychology  
MR interaction: visual, audio, gesture

A3.2 Prototyping: (a3.shtml) Implement

**FEB 27**

UCD: Rapid prototyping and "MVP"  
MR prototyping: tools and inspiration

A4 Evaluation (a4.shtml): go out and test

**MAR 6**

Test your prototype on classmates  
UCD: usability testing and heuristics

A5 Design as Critique (a5.shtml)

**MAR 13**

*Spring Break—no class*

**MAR 20**

Review assignment learnings  
Critical and future perspectives on AR

A6.1 Final (a6.shtml): Proposals

**MAR 27**

Proposals pin-up

A6.2 Final (a6.shtml): Research

**APR 3**

Research pin-up

A6.3 Final (a6.shtml): Prototype

**APR 10**

Prototype pin-up / test on your classmates

A6.4 Final (a6.shtml): Evaluate

**APR 17**

Desk crits

A6.5 Final (a6.shtml): Conclusion & Documentation

**APR 24**

*Final Review*