UNIVERSITY OF MIAMI
SCHOOL of ARCHITECTURE

Introduction to Virtual and Augmented Reality in Architecture

ARC 586/ ARC 686 | 3 credits

Instructor: Ruth Ron | rron@miami.edu

Fridays 9:05AM-12:05PM | ARC48 -320

Office hours: zoom by email appointment

Course Description

This course provides an overview of virtual, augmented, and mixed reality concepts in the context of the evolution of Digital Architecture. The class will examine selected themes of visual media, immersive visualization, and the development of digital technology with reference to three-dimensional representation.

Students will be assigned weekly reading of seminal texts that will facilitate the class's navigation through selected histories of spatial extension in architecture.

Reading topics will include definitions and basic theory by Derrick De Kerckhove, Lev Manovich and Or Ettlinger, early AR/ VR explorations by architects as Marcos Novak and Hani Rashid, the 'Expanded Cinema' movement and the work of Jeffery Shaw. Students will create class presentations and investigate related precedents for each cluster of readings.

Parallel to the advancement of exclusive and extensive VR/AR technology, such as commercial goggles, there is a rapid development of mobile phone cameras, as well as free AR/VR software and Apps. The class will use a variety of virtual reality (VR) and augmented reality (AR) techniques and applications to generate spatial documentation and creatively probe architectural time-space-movement.

Course Objectives

The class will explore examples of VR/AR in spatial, architectural, and urban contexts. Looking for past examples, current products and near-future scenarios, we will explore these topics and tools as an extension on our architectural training and practice. It will prepare students to think about VR/AR as an architect and leverage these media in an innovative and creative way.

The teaching technique is experimental and open-ended, encouraging "hands-on" learning and prototype development. We'll read books, watch movies, analyze

precedents, and learn how to use basic software and applications. We will introduce 2D graphics, 3D modeling and time-based tools.
Basic knowledge of Photoshop and 3D modeling is recommended.

Evaluation

-Active Class Participation: 20% (on-time, whole duration of class (w/ camera on))
-Reading discussions and Assignments: 30%
-Class Project: 50%

Reading List

1. Definition and theory
   De Kerkhove, Derrick, (2001) The Architecture of Intelligence, Basel; Boston;Berlin: Birkhäuser

2. Ettlinger, Or, (2008) The Architecture of Virtual Space, University of Ljubljana

3. Marcos Novak– Transarchitecture and Liquide Architecture
   Adelmootranto (2019). Marcos Novak - Liquid Architecture. [Online]. Available at: https://i-dat.org/marcos-novak/

   Brizzi, M. (2013). Interview with Marcos Novak. [Online]. Available at: https://www.youtube.com/watch?v=WEnkHjjxQEc

   Marcos Novak - ADA | Archive of Digital Art [Online]. Available at: https://www.digitalartarchive.at/database/artists/general/artist/novak.html

   Novak, Marcos, (1998) 'Transarchitectures and Hypersurfaces' in Perrella, S. (ed.) AD Architectural Design: Hypersurface Architecture. Academy Press, pp. 84-94.

4. Hani Rashid & Greg Lynn
   Rashid, H. (2002) 'Architecture=Space=Interface' in Leach, N. (ed.) Designing for a Digital World. Academy Press, pp. 134-137.

   Rashid, H. and Couture, L. A. (2002) Asymptote: Flux. London; New York: PhaidonPress

   Rashid, H. (2017) 'Post-Internet Cities. Learning from the Virtual', e-flux, Post-Internet Cities [online]. Available at: https://www.e-flux.com/architecture/post-internet-cities/140714/learning-from-the-virtual/

   Frearson, A. (2016) 'Augmented Reality Will Change the Way Architects Work Says Greg Lynn', Dezeen [online]. Available at: https://www.dezeen.com/2016/08/03/microsoft-hololens-greg-lynn-augmented-

realityarchitecture-us-pavilion-venice-architecture-biennale-2016/

5. Jeffrey Shaw, Peter Weibel, Manuela Abel, Anne-Marie Duguet, Heinrich Klotz- 'Jeffery Shaw: A Users Manual: From Expanded Cinema to Virtual Reality' (1997)

6. Lev Manovich (2003) 'New Media From Borges to HTML'. The New Media Reader. Ed. Noah Wardrip-Fruin & Nick Montfort. Cambridge, Massachusetts. P.13–25.

   Manovich, Lev, (1999) Avant- Garde as Software, Lev Manovich, http://manovich.net/index.php/projects/avant-garde-as-software

   Manovich, Lev, (2001) The Language of New Media, Cambridge: MITPress/Leonardo Books.

7. Brian Massumi, (1998) 'sensing the virtual, building the insensible', In- Hypersurface Architecture, edited by Stephen Perrella, Architectural Design(Profile no. 133), vol. 68, no. 5/6, pp. 16-24 [online]. Available at: Microsoft Word - Sensing the Virtual.DOC

8. VR/AR in Architecture

   Abboud, R. (2014) 'Architecture in an Age of Augmented Reality': Mobile AR's Opportunities and Obstacles in Design, Construction, and Post-Completion.NAWIC IWD Scholarship Winner

9. VR/AR in ART

   Oliver Grau, (2003) 'Virtual Art: From Illusion to Immersion', Cambridge, Massachusetts; London, England: MIT Press

   Hitti, N. (2020) 'Apple Augmented Reality Art Tours to Take Place in Six Major Cities', Dezeen [online]. Available at: https://www.dezeen.com/2019/07/31/apple-augmented-reality-art-tours-technology/?li_source=LI&li_medium=bottom_block_1

   Timothy Murray, (2011) Derrick de Kerckhove, Oliver Grau, Kristine Stiles, Jean-Baptiste Barrière, Dominique Moulon, Jean-Pierre Balpe, Maurice Benayoun, OpenArt, Nouvelles éditions Scala, French version.

   Wilson, Stephen (2003) 'Information Arts: Intersections of Art, Science, andTechnology' (Leonardo), The MIT Press

   Leopoldseder, Hannes, 'Ars Electronica', Hatje Cantz [catalogs -various years]

   Christiane, Paul, (2003) 'Digital Art', Thames and Hudson.

Christov-Bakargiev, Carolyn, (2002) 'Janet Cardiff: A Survey of Works, Including Collaborations with George Bures Miller', P.S.1

10. VR/AR + General

Logan, Robert K. (2010) 'Understanding New Media: Extending MarshallMcLuhan', New York: Peter Lang Publishing

Laura Kurgan, (2013) 'Close up at a Distance: Mapping, Technology, and Politic's,Zone Books [eBook]

Aldersey-Williams, Hugh, Hall, Peter, et al. (2008) 'Design and the Elastic Mind'MoMA, [partial PDF]

Allen, Stan, (1999) 'Points and Lines: Diagrams and Projects for the City',Princeton Architectural Press

Castels, Manuel, (2000) 'The Rise of the Network Society', Blackwell PublishersDe Landa, Manuel, (1997) 'A Thousand Year of Nonlinear History', Zone Books

Hansen, Mark, (2004) 'New Philosophy for New Media', MIT Press, [eBook]

Malcom McCollough, (2013) 'Ambient Commons: Attention in the Age ofEmbodied Information' [eBook]

Recordings:
Students are expressly prohibited from recording any part of this course. Meetings of this course might be recorded by the instructor. Any recordings will be available to students registered for this class as they are intended to supplement the classroom experience. Students ae expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Recordings may not be reproduced, shared with those not in the class, or uploaded to other online environments. If the instructor or a University of Miami office plans any other uses for the recordings, beyond this class, students identifiable in the recordings will be notified request consent prior to such use.

Class Attendance Policy:
Physical attendance in the classroom is required. If at some point in the semester you cannot physically attend class session due to illness, injury, or other approved absence, you must contact the instructor for permission to temporarily attend the course online. Unexcused absences from the classroom may affect your grade or lead to failing the course.