

AD41700 Augmented and Virtual Reality Art  
(Variable Topics in Electronic and Time-Based Art)  
Prof. Fabian Winkler  
Fall 2017

## **AD41700: Augmented and Virtual Reality Art**

*AD41700 Augmented and Virtual Reality Art* gives students the opportunity to create immersive Virtual Reality (VR) content for the Oculus Rift headset as well as Augmented Reality (AR) content for mobile devices. Students learn to use the Unity3D development platform (unity3d.com – no prior experience required) and explore the artistic and critical potential of AR and VR content researching both historical precursors and contemporary trends.

Specifically, this class consists of technical workshops, hands-on project work creating AR and VR applications as well as class discussions and critiques of student work. Students will also research artists working with AR and VR technologies, the history of the medium as well as critical cultural topics in VR and AR content and present their findings in class presentations.

Students will use Unity3D as the main software application in the course, creating two projects – one developing a mobile AR app for smartphones. This project allows students to augment physical objects and/or sites on the Purdue West Lafayette campus that are important to them with meaningful visual content for the purpose of expression, aesthetic experimentation or commentary. In the second project students are scanning sites on campus with a low-cost Scanse SWEEP Lidar system and represent these sites immersively using HTC Vive and/or Oculus headsets. Both projects will require students to think more deeply about the relationship of real and digital sites, embodiment as well as new hybrid forms of nature/architecture/space.

Course Number: AD 41700  
Instructor: Fabian Winkler  
Mondays/Wednesdays, 2:30–5:20pm  
FPRD 204 (studio/seminar space) and Pao B179 (computer lab)

Course web site:  
[http://web.ics.purdue.edu/~fwinkler/AD41700\\_F17](http://web.ics.purdue.edu/~fwinkler/AD41700_F17)

Website of the Electronic and Time-Based Art program at Purdue:  
<https://www.cla.purdue.edu/academic/vpa/ad/act/>

## **Contact Information**

Fabian Winkler, Associate Professor  
Office: FPRD 202  
Office hours by appointment  
E-mail: [fwinkler@purdue.edu](mailto:fwinkler@purdue.edu)  
Telephone: 49-40160 (office)

## Disabilities and Adaptive Programs Statement

Students with disabilities must register with Adaptive Programs in the Office of the Dean of Students before classroom accommodations can be provided. If you are eligible for academic accommodations because you have a documented disability that will impact your work in this class, please schedule an appointment with the instructor as soon as possible to discuss your needs.

## Counseling and Psychological Services Information

Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at (765)494-6995 and <http://www.purdue.edu/caps/> during and after hours, on weekends and holidays, or through its counselors physically located in the Purdue University Student Health Center (PUSH) during business hours.

## Emergency Statement

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. Here are ways to get information about changes in *this* course. The instructor's email address: [fwinkler@purdue.edu](mailto:fwinkler@purdue.edu), and office phone: 494-0160.

- To report an emergency, call 911.
- To obtain updates regarding an ongoing emergency and to sign up for Purdue Alert text messages view [www.purdue.edu/ea](http://www.purdue.edu/ea).

**EMERGENCY NOTIFICATION PROCEDURES are based on a simple concept – if you hear a fire alarm inside, proceed outside. If you hear a siren outside, proceed inside.**

**Indoor Fire Alarms** mean to stop class or research and immediately evacuate the building.

- Proceed to your Emergency Assembly Area away from building doors. **Remain outside** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.
- **All Hazards Outdoor Emergency Warning Sirens** mean to immediately seek shelter (**Shelter in Place**) in a safe location within the closest building.
- “Shelter in place” means seeking immediate shelter inside a building or University residence. This course of action may need to be taken during a tornado, a civil disturbance including a shooting or release of hazardous materials in the outside air. Once safely inside, find out more details about the emergency\*. **Remain in place** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.

*\*In both cases, you should seek additional clarifying information by all means possible...Purdue Emergency Status page, text message, email alert, TV, radio, etc...review the Purdue Emergency Warning Notification System multi-communication layers at [http://www.purdue.edu/ehps/emergency\\_preparedness/warning-system.html](http://www.purdue.edu/ehps/emergency_preparedness/warning-system.html)*

## EMERGENCY RESPONSE PROCEDURES

- Review the **Emergency Procedures Guidelines**  
[https://www.purdue.edu/emergency\\_preparedness/flipchart/index.html](https://www.purdue.edu/emergency_preparedness/flipchart/index.html)
- Review the **Building Emergency Plan** (available on the Emergency Preparedness website or from the building deputy) for:
  - evacuation routes, exit points, and emergency assembly area
  - when and how to evacuate the building
  - shelter in place procedures and locations
  - additional building specific procedures and requirements

## PAO – VPA BUILDING EMERGENCY PLAN FPRD and PAO – VPA

[www.purdue.edu/ehps/emergency\\_preparedness/emergency/building-plan.html](http://www.purdue.edu/ehps/emergency_preparedness/emergency/building-plan.html)

Select • BEP LIST, Scroll down to and select:

FPRD--Forest Products Building Emergency Plan

([http://www.purdue.edu/ehps/emergency\\_preparedness/bep/FPRD-bep.html](http://www.purdue.edu/ehps/emergency_preparedness/bep/FPRD-bep.html))

### **Emergency Contact Information:**

Building Deputy: Betty Barlow (1<sup>st</sup> floor) and Jon Smith (2<sup>nd</sup> floor)

Phone Number: 494-3615, 496-6477

Email Address: [bbarlow@purdue.edu](mailto:bbarlow@purdue.edu), [jssmith@purdue.edu](mailto:jssmith@purdue.edu)

Office/Room Number: Pao 1114

Pao-Visual and Performing Arts Building Emergency Plan

([http://www.purdue.edu/ehps/emergency\\_preparedness/bep/pao-bep.html](http://www.purdue.edu/ehps/emergency_preparedness/bep/pao-bep.html))

### **Emergency Contact Information:**

Building Deputy: Jon Smith

Phone Number: 496-6477

Email Address: [jssmith@purdue.edu](mailto:jssmith@purdue.edu)

Office/Room Number: Pao 1114

### **Non-emergency Contact Numbers:**

- \* Fire: Purdue Fire Department (PUFD) 494-6919
- \* Police: Purdue Police Department (PUPD) 494-8221
- \* Radiological and Environmental Management: 494-6371
- \* Physical Facilities Services: 494-9999
- \* Emergency Preparedness Office 494-0446

## EMERGENCY PREPAREDNESS AWARENESS VIDEOS

- "Shots Fired on Campus: When Lightning Strikes," is a 20-minute active shooter awareness video that illustrates what to look for and how to prepare and react to this type of incident.  
See: <http://www.purdue.edu/securePurdue/news/2010/emergency-preparedness-shots-fired-on-campus-video.cfm> (Link is also located on the EP website)
- All Hazards Online Awareness training video (on Webcert & Blackboard.) A 30 minute computer based training video that provides safety and emergency preparedness information. See the [EP website](#) for sign up instructions.

## **MORE INFORMATION**

Reference the Emergency Preparedness web site for additional information:

[https://www.purdue.edu/ehps/emergency\\_preparedness/](https://www.purdue.edu/ehps/emergency_preparedness/)

## **Course Evaluations Statement**

During the last two weeks of the semester, you will be provided with an opportunity to evaluate this course and your instructor(s). Purdue now uses an online course evaluation system. Near the end of classes, you will receive an official e-mail from administrators with a link to the online evaluation suite. You will have up to two weeks to complete this evaluation. Your participation is an integral part to this course and your feedback is vital to improving education at Purdue University. I strongly urge you to participate in the evaluation system.

## **Academic Dishonesty Statement**

Purdue prohibits “dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty.” [Part 5, Section III-B-2-a, of University Regulations] Furthermore the university Senate has stipulated that “the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs., plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest.” [University Senate Document 72-18, December 15, 1972]

## **Plagiarism Statement**

The Office of the Dean of Students will investigate instances of reported plagiarism and take appropriate actions. See the Dean of Students web page for descriptions of plagiarism and university plagiarism policies). <http://www.purdue.edu/univregs/studentconduct/regulations.html>. All acts of plagiarism are violations of the University Academic Dishonesty Policy and will be dealt with according to procedures established by the university.

*As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together – we are Purdue.*

## **Class Attendance Statement**

Purdue University policy states that all students are expected to be present for every meeting of classes in which they are enrolled. All matters relative to attendance, including the make-up of missed work, are to be arranged between you and the instructor. Only the instructor can excuse you from classes or course responsibilities. In the case of an illness, accident, or an emergency, you should make direct contact with your instructor as soon as possible, preferably prior to class. If the instructor cannot be reached directly a message should be left in the instructor’s departmental mailbox or with the department secretary. If you will be absent for more than five days, and have

not been able to reach the instructor in person or by telephone or through leaving notification of your circumstances with the divisional secretary, you or your representative should notify the Dean of Students (765-494-1254) as soon as possible after becoming aware that the absence is necessary. Be advised, you may be asked to provide documentation from an authorized professional or agency which supports an explanation for your absence.

## **Reproduction of Student Work Statement**

The Purdue University Department of Art and Design (School of Visual & Performing Arts) retains a non-exclusive right to reproduce all undergraduate and graduate student projects for the purpose of education, publication, promotion, illustration, advertising, trade in any manner or medium now known or later developed in perpetuity.

## **Course Fees Statement**

### **Course Fees for Studio-Based Courses in the Department of Art & Design**

Course fees for A&D studio-based courses enhance the educational experience of all students enrolled in studio-based courses in the Department of Art and Design.

The objectives of the course fees are:

1. To provide and maintain the best state-of-the-art equipment and support possible for optimal learning in all programs in the department.
2. To obtain and distribute course materials that are more economical to purchase in bulk, are more environmentally-friendly, or that may not be available locally.

Course fees do not cover all costs associated with a studio-based course. Students may have additional materials and/or texts to purchase in addition to what is supplied by the instructor.

### **Department of Art and Design Course Fee Refund Policy**

If an Art and Design course with course fees is dropped within the first week of classes the fee will be removed from the student's account at 100%. If the student drops the course after the first week of classes the fee is considered non-refundable. If the student chooses to appeal this, they would need to contact the Chair of the Department of Art and Design; if an exception were approved then the Department Chair would email the Comptroller & Bursar Office to adjust the fee as appropriate.

## **Course Learning Outcomes**

Upon the successful completion of this course, student will have acquired:

- Knowledge of key works in the emerging field of augmented and virtual reality art.
- Skills to use emerging AR and VR technologies not only as cool gadgets but as tools for meaningful aesthetic expressions, new narratives and critical commentary.
- A variety of practical proficiencies including basic knowledge of:
  - Unity3D as a software tool to create augmented and virtual reality art.
  - Acquisition of 3D data with a Scanse Sweep 3D LIDAR scanner.
  - Translation of 3D scans of physical environments into immersive virtual reality environments that can be experienced and navigated with the Oculus Rift or HTC Vive headsets.

Course Learning Outcomes (continued):

Upon the successful completion of this course, student will have acquired:

- Basic research skills that place AR/VR artworks in larger cultural and socio-technological contexts.

## Student Responsibilities

- Come to class on time and prepared to contribute. Being late (>10mins. after class has started) three times equals one absence.
- Attendance is required. Three or more unexcused absences result in a significant reduction of the final grade. Make sure to sign the attendance sheet when you come to class. It is your responsibility to sign in at the beginning of each class!
- Deadlines are mandatory; late work will receive grade deduction.
- DO NOT do your email or surf the web during a critique, discussion or technical workshop.
- Be respectful of your fellow students. Turn off your smartphones in class. No one is to make or receive calls or instant message during class.
- DO NOT alter any material or data file belonging to another student without his/her permission.
- Feel free to ask questions. This is a beginning class; no question is too elementary. Don't say "help me, I can't do this", say instead, "I tried this approach, but this happened, I tried that approach, but this didn't work, what do you suggest?" I will help when you ask, and I will respond well to people who seem interested and industrious.
- Help each other, during class workshops and while working on assignments. Share information and exchange ideas, use the potential to be part of this class.
- You will not receive a passing grade for this class without turning in the final project portfolio/documentation (on the supplied portfolio USB thumbdrive).
- Also you will not receive a passing grade for this class without turning in all checked out equipment by the final portfolio deadline.

## Grading Guidelines

I will look specifically at the idea behind your assignment work. Every project starts with a good idea or concept. The best ideas are often simple – without being simple-minded! Project work resulting from these ideas needs to be consistent, precise and on the point. Some of the questions I use to evaluate your work are: How original is the idea behind the work? How precise is realization of this idea? Does the work ask interesting questions? Is the student engaging critically with the technology/topic at hand? Was the student well motivated and did he/she present the idea clearly in class?

Remember that you can create outstanding time-based/new media works without the use of complex technology but rather with a clever and imaginative use of the resources at hand. Furthermore, the projects you are creating in this course ideally place your ideas and concepts in a larger context – they can be related to society, cultural or political issues, historical events, etc.

In summary, the highest grades will be given for work that is highly original, creative and imaginative. This work exemplifies concepts in surprising and challenging ways and

adds something to what already exists. An outstanding time-based/new media work needs to possess a strong aesthetic element and create meaning effectively through form, experience over time and story/expressiveness. It should have the potential to open doors to new ways of thinking about the theme/content it investigates.

Not only will I look at your performance presenting your own work during critiques but I will also take into consideration your overall participation in class discussions and critique of other students' work.

Assignment Breakdown:

- Assignment 01: AR work 35%
- Assignment 02: VR work 35%
- Student Artist Presentation: 30%

**Remember that your class attendance has an effect on your overall grade – three or more unexcused absences result in a significant reduction of the final grade!**

Academic dishonesty, for example by using somebody else's artwork and presenting it as your own or by copying somebody else's text passages and presenting them as your own will result in a failing grade (F) for the assignment in which it was encountered. Also, late work will receive grade deduction – one full letter grade reduction per class meeting that the assignment was turned in late.

Here are the numerical values for each letter grade:

A+	15	C+	9	F	<4
A	14	C	8		
A-	13	C-	7		
B+	12	D+	6		
B	11	D	5		
B-	10	D-	4		

I always try to give detailed feedback about your performance and the quality of your work together with the grade after each assignment. This should give you a feeling for the points that are important – in a good presentation, project or research.

## Documentation on USB Thumbdrive

The final portfolio/documentation for AD41700 should include:

- Stand-alone application files and source code for both assignment 01 (AR) and assignment 02 (VR).
- Project descriptions (word or .pdf format) for assignments 01 and 02.
- A copy of your presentation file (Powerpoint, Keynote, Prezi, etc.) for the student artist presentation.

Fabian will give you a USB thumbdrive that you can use for storing all these files. The deadline to turn in the final documentation on this USB drive is Friday 12/15/2017 at noon (Fabian's mailbox in Pao 3121). You won't receive a final passing grade for this class without turning in the final documentation by this deadline.

## Bibliography

The following Resources are by no means complete but they provide a good starting point for further research and critical investigation in the field of Augmented and Virtual Reality.

Cline, Ernest. *Ready Player One*. New York: Broadway Books, 2011.

Farago, Jason. "Virtual Reality Has Arrived in the Art World. Now What?" *The New York Times*. Accessed 8/20/2017.  
<https://www.nytimes.com/2017/02/03/arts/design/virtual-reality-has-arrived-in-the-art-world-now-what.html>

Featherstone, Mike and Roger Burrows (editors). *Cyberspace/Cyberbodies/Cyberpunk: Cultures of Technological Embodiment*. London: Sage Publications, 1995.

Gibson, William. *Neuromancer*. New York: Ace Books, 1984.

Gottschalk, Molly. "Virtual Reality Is the Most Powerful Medium of Our Time." *Artsy - A Resource for Art Collecting and Education*. Accessed 8/20/2017  
<https://www.artsy.net/article/artsy-editorial-virtual-reality-is-the-most-powerful-artistic-medium-of-our-time>

Grau, Oliver. *Virtual Art: from Illusion to Immersion*. Cambridge, MA: MIT Press, 2003.

Heim, Michael. *Virtual Realism*. Oxford, England: Oxford University Press, 1998.

Hillis, Ken. *Digital Sensations: Space, Identity and Embodiment in Virtual Reality*. Minneapolis, MN: University of Minnesota Press, 1999.

Lanier, Jaron. "A Vintage Virtual Reality Interview." *Jaron Lanier's Homepage*. Accessed 8/20/2017.  
<http://www.jaronlanier.com/vrint.html>

Lukic, Dejan and Seol Park. "Virtual Art, Anchored in Reality: A Conversation on Location-Based AR." *Media-N - The Journal of the New Media Caucus*. Accessed 8/20/2017  
<http://median.newmediacaucus.org/mestizo-technology-art-design-and-technoscience-in-latin-america/virtual-art-anchored-in-reality-a-conversation-on-location-based-ar/>

McRobert, Laurie. *Char Davies' Immersive Virtual Art and the Essence of Spatiality*. Toronto, ON: University of Toronto Press, 2007.

## Bibliography (continued):

Marantz, Andrew. "Studio 360 – The pioneers who are making the first virtual–reality narratives." *The New Yorker*. Accessed 8/20/2017.

<http://www.newyorker.com/magazine/2016/04/25/making-movies-with-virtual-reality>

Murray, Janet H. *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*. Cambridge, MA: MIT Press, 2017.

Packer, Randall and Ken Jordan (editors). *Multimedia: from Wagner to Virtual Reality*. New York: W. W. Norton & Company, 2001.

Shardlow, Estella. "Augmented Reality Meets the Art World." *Apollo – The International Art Magazine*. Accessed 8/20/2017.

<https://www.apollo-magazine.com/augmented-reality/>

Shaw Jeffery and Peter Weibel. *Future Cinema: The Cinematic Imaginary after Film*. Cambridge, MA: MIT Press, 2003.

Stein, Joel. "Why Virtual Reality Is About to Change the World." *TIME Magazine*. Accessed 8/20/2017. <http://time.com/3987022/why-virtual-reality-is-about-to-change-the-world/>

## Artists

Similar to the bibliography above, this list is by no means complete but it will provide a good starting point for further research and critical investigation in the field of Augmented and Virtual Reality.

- Rebecca Allen  
<http://www.rebeccaallen.com/home>
- Maurice Benayoun  
<http://benayoun.com/moben/1997/02/12/world-skin-a-photo-safari-in-the-land-of-war/>
- Janicza Bravo  
<http://www.indiewire.com/2017/01/lemon-janicza-bravo-sundance-interview-1201774063/>
- Janet Cardiff & George Bures Miller  
<http://www.cardiffmiller.com/artworks/inst/forest.html>
- Ian Cheng  
<http://iancheng.com/>
- Jeremy Couillard  
<http://www.jeremycouillard.com/>
- Char Davies  
<http://www.immersence.com/>

Artists (continued):

- Cao Fei  
<http://www.caofei.com/news.aspx>  
<https://art21.org/watch/art-in-the-twenty-first-century/s5/cao-fei-in-fantasy-segment/>
- Aaron Koblin  
<https://www.with.in/>
- Langlands & Bell  
<http://www.langlandsandbell.com/portfolio-item/the-house-of-osama-bin-laden-stills-2003/>  
<http://www.langlandsandbell.com/portfolio-item/the-house-of-osama-bin-laden-video-2003/>
- The Machine to Be Another  
<http://www.themachinetobeanother.org/>
- Manifest AR  
<https://manifestarblog.wordpress.com/about/>  
<http://www.sndrv.nl/moma/>
- Marshmallow Laser feast  
<http://marshmallowlaserfeast.com/>  
<https://vimeo.com/140057053>
- Nonny de la Peña  
<http://www.immersivejournalism.com/>
- Jon Rafman  
<http://jonrafman.com/>
- Rachel Rossin  
<http://rossin.co/>
- ScanLAB  
<http://scanlabprojects.co.uk/>  
<http://scanlabprojects.co.uk/work/post-lenticular-landscapes/>
- Jeffrey Shaw  
<http://www.jeffreyshawcompendium.com/>
- Daniel Steegman Mangrané  
<http://www.danielsteegmann.info/works/41/index.html>
- Thamiko Thiel  
<http://www.tamikothiel.com/>
- Milica Zec  
<http://miliczec.com/about/>  
<https://www.transportvr.com/milica-zec>

## Online Resources

Contemporary Art	<a href="http://www.theartassignment.com/about/">http://www.theartassignment.com/about/</a> <a href="http://www.pbs.org/art21/">http://www.pbs.org/art21/</a>
New media artworks and history	<a href="http://www.mediaartnet.org/">http://www.mediaartnet.org/</a> <a href="http://www.fondation-langlois.org/html/e/">http://www.fondation-langlois.org/html/e/</a> <a href="http://www.ubuweb.com/">http://www.ubuweb.com/</a> <a href="http://rhizome.org/">http://rhizome.org/</a>
Festivals/calls	<a href="http://rhizome.org/community">http://rhizome.org/community</a> <a href="http://www.aec.at/prix/en/">http://www.aec.at/prix/en/</a> <a href="http://www.newmediacaucus.org/calls/">http://www.newmediacaucus.org/calls/</a> <a href="http://netex.nmartproject.net/">http://netex.nmartproject.net/</a> <a href="https://ismar2017.sciencesconf.org/">https://ismar2017.sciencesconf.org/</a> <a href="http://s2018.siggraph.org/submissions/">http://s2018.siggraph.org/submissions/</a> <a href="http://www.sundance.org/programs/new-frontier">http://www.sundance.org/programs/new-frontier</a>
Technology	<a href="https://unity3d.com/">https://unity3d.com/</a> <a href="https://www.tinkercad.com/">https://www.tinkercad.com/</a> <a href="https://www.autodesk.com/solutions/3d-modeling-software">https://www.autodesk.com/solutions/3d-modeling-software</a> <a href="https://www.magicleap.com">https://www.magicleap.com</a>
Learning	<a href="https://unity3d.com/community">https://unity3d.com/community</a> <a href="https://unity3d.com/learn">https://unity3d.com/learn</a> <a href="https://unity3d.com/learn/tutorials">https://unity3d.com/learn/tutorials</a> <a href="https://www.lynda.com/">https://www.lynda.com/</a>
VR Experiences	<a href="https://www.oculus.com/experiences/rift">https://www.oculus.com/experiences/rift</a> <a href="https://www.vive.com/us/product-experiences/">https://www.vive.com/us/product-experiences/</a> <a href="https://www.transportvr.com/">https://www.transportvr.com/</a> <a href="http://www.nytimes.com/marketing/nytvr/">http://www.nytimes.com/marketing/nytvr/</a>
Aesthetics	<a href="http://digital-foundations.net/">http://digital-foundations.net/</a>

## **Art and Design mailing list**

If you would like to find out about the latest events in the Department of Art and Design, internship opportunities, exhibitions and other art and design related news, please sign up to the moderated mailing list in the Department of Art and Design: <https://lists.purdue.edu/mailman/listinfo/artanddesign>

Please direct any questions about the A&D mailing list to Kathy Evans: [kathy@purdue.edu](mailto:kathy@purdue.edu)

Also check the bulletin board in the FPRD hallway outside of FPRD204 as well as the pinboards in Pao B179 for call outs, announcements and news clippings.