IDIA LAB

BALL STATE UNIVERSITY

INSTITUTE FOR DIGITAL INTERMEDIA ARTS
COLLEGE OF ARCHITECTURE AND PLANNING

College of Architecture and Planning's IDIA Lab creates technological innovations in the arts, sciences, humanities – engaging students, staff, scholars and clients in contracted projects in 3D, virtual reality and mobile applications. This newsletter includes updates on current IDIA Lab projects including a visitor experience app for Mesa Verde National Park, the installation of our new immersive virtual reality CAVE theater, visiting scholars and lectures, an augmented reality museum installation, support for a CAP Landscape Architecture course, a drone photography project for the Hoosier Environmental Council and the public release of our major open source audio project Audio Toolkit for Unity.

BSU LAUNCHES VIRTUAL REALITY THEATER

IDIA Lab VR CAVE in CAP

Ball State University now has a state-of-the-art virtual reality theater! The facility, also known as a CAVE (Cave Automatic Virtual Environment} was created as custom solution in collaboration with the Elumenati – a design and engineering firm specializing in advanced visualization environments and experiences. The CAVE, located on the ground floor of the College of Architecture and Planning, positions BSU research and design in an elite cohort of international universities and institutions that support next generation visualization. The theater consists of a custom designed curved immersive cyclorama - surrounding viewers in an expansive 270 degree, 25 foot diameter, 11 foot tall circular environment of 3D content! The seamless screen is front projected by (2) 4K laser projectors with spatialized sound coming from a custom designed 8.1 surround sound environment. The system provides architects, designers, artists, scientists and scholars a platform to dynamically and immersively engage research and teaching for dozens of simultaneous participants.

The first CAVE was invented by the University of Illinois, Chicago Electronic Visualization Laboratory in 1992. A traditional CAVE is typically a cubic four sided video theater situated within a larger room. The walls of a CAVE are often made up of rear-projection screens, consisting of 3 sides and a floor. The BSU system is innovative in its reimaging of the original CAVE concept in that it is a cylindrical section of a sphere – requiring specialized computers and lenses to spherically warp the image in real time.

Custom design for BSU by The Elumenati

The Elumenati systems are engaged in experiential marketing, themed entertainment, and the arts - with clients including Dreamworks, Cirque du Soleil, NVIDIA, NASA, NOAA, and leading science museums around the globe. Look for an upcoming open house announcement!

ATK: Open Source Audio Library for Unity 3D

IDIA Lab developed and released an open source audio synthesis library for the game engine of Unity 3D. ATK (Audio Tool Kit) contains four example sound scripts that developers can use as a reference to script their own custom sounds. Using procedurally-generated audio instead of pre-recorded audio files has two main benefits - allowing sound designers to significantly reduce file size by not using samples as well as providing the ability to dynamically process live generative sound. Audio files can take up megabytes of disk space, while procedural audio is an order of magnitude smaller, typically only requiring kilobytes to store its script's algorithm. Adding physics and logic as input, a given sound script may never produce the same output more than once. Repetitive game sounds such as wind, mechanical, water, and fire are well suited to take advantage of this utility. IDIA Lab's ATK is freely available on the Unity Asset Store. http://idialab.org/atk-procedural-audio-library/

TWEETS

• IDIA Lab will be participating in Muncie's Brink of Summer ArtsWalk at Madjax on May 2nd 5-8

• IDIA Lab will be presenting at the Muncie Steam Expo at Madjax on Saturday, May 11th 1-4pm

• IDIA Lab offers free VR/AR workshops Mon 6-8 and Tues 8–1 in the CAP SimLab AB023

ANNUAL DIGITAL SCHOLARSHIP LECTURE: DR BERNARD FRISCHER

Rome Reborn: 3D Reconstructions as Tools for Discovery

Rome Reborn by Bernard Frischer

Bernard Frischer is a digital archaeologist who researches virtual heritage, Classics, and the survival of the classical world. He received his Ph.D. in Classics from the University of Heidelberg. He followed his doctoral work in Germany with a two-year postdoc at the American Academy in Rome, where he studied Roman topography and archaeology. Dr. Frischer currently is a professor of Informatics at Indiana University. Virtual Heritage is an emerging field studying methods of applying 3D technologies to research and instruction in fields such as anthropology, art, architectural history, and conservation science. Professor Frischer has been a leading figure in the field, overseeing many 3D modeling projects, including Rome Reborn.

The Rome Reborn project is an international initiative, launched in 1996, to create a 3D reconstruction of ancient Rome in AD 320. The model, which took 22 years to complete, makes it possible for newcomers to the subject of Roman topography and urban history to obtain a quick visualization of the monuments in their context in the city. The purpose of this talk is not to explore these instructional applications of the model but to draw out the uses of virtual reality as a tool of discovery.

• Sponsored by the Digital Scholarship Lab (DSL), the Institute for Digital Intermedia Arts (IDIA) and
  the Ancient Studies Program at Ball State University.

• Introduction by BSU Provost Dr. Susana Rivera-Mills.

Wednesday, April 17th 7:30 pm AR217 Recital Hall

VIRTUAL REALITY IN THE ART HISTORY CLASSROOM
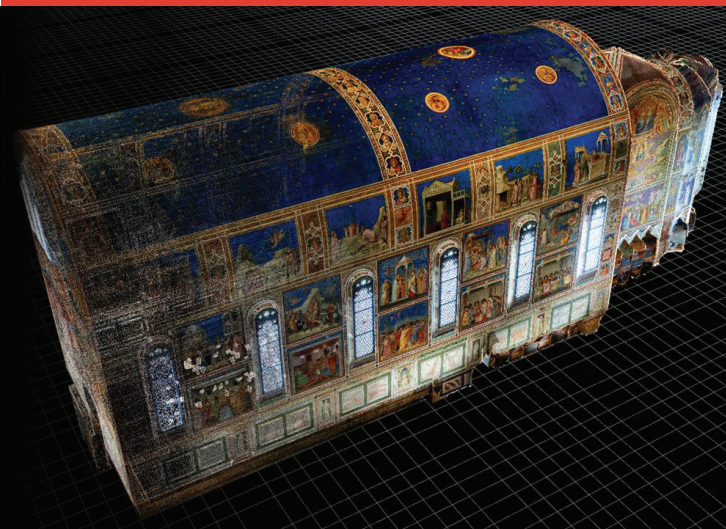
Virtual Reality in the Art History Classroom - virtual visits to masterpieces of Italian Renaissance frescoes.

Matthew Brennan, Indiana University. Digital Scholarship Digital Feed. Thursday, April 18th at noon.

Virtual Reality offers unique and interesting implications for education in the fields of Art and Architectural History. This talk covers the implementation of four virtual reality applications. The concept, design, revision, and lessons learned from the operationalization of the four stand-alone didactic VR applications will be covered.

AUGMENTED REALITY MUSEUM EXHIBIT
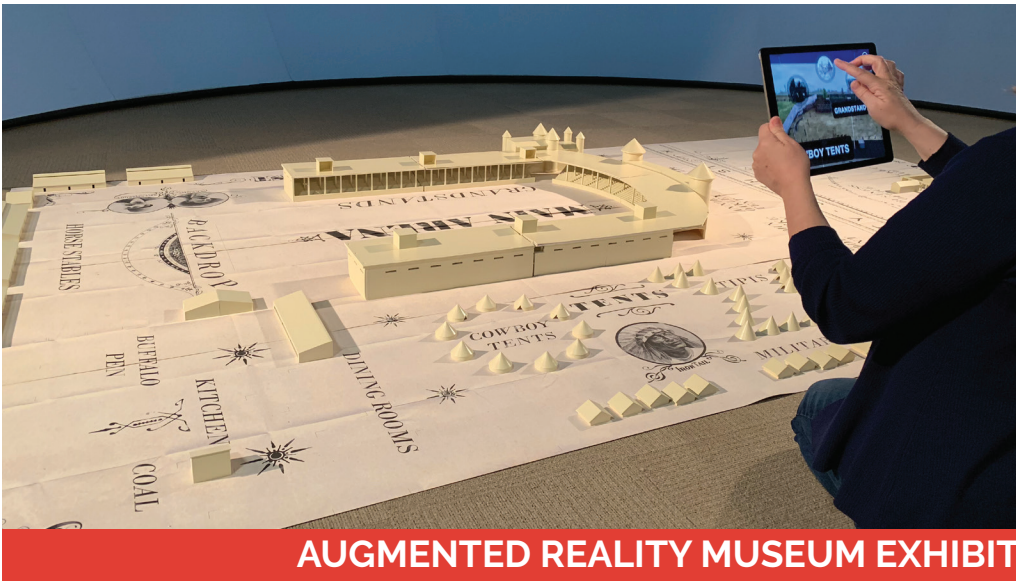
Buffalo Bill Center of the West. Cody, WY

Buffalo Bill Wild West virtual diorama.

In 1894 electricity was a new phenomenon, one that made it possible to attend a Buffalo Bill Wild West Show in Brooklyn, NY, after dark. A few faded photographs remain, along with the original electrician's diagrams, but they leave much to the imagination.

Ball State's IDIA Lab has brought the scene to life via a printed 3D diorama and an augmented reality app. Destined for the Buffalo Bill Center of the West in Cody, Wyo., the display will allow museum goers to use their smart phones to bring the scene to life: campfires blazing, horses racing on the oval track inside the grandstand, and crowds milling about.

John Fillwalk is the project lead and senior director of IDIA Lab. This is his second of four planned projects for the Wyoming museum; the next is focused on the Big Horn Basin and will be an interactive virtual reality display to depict immigration and climate.

Production specialist Neil Zehr did the research to make the tracking work on the cutting-edge Wild West Show project, using a beta version of Apple software. The technology – including gyroscopes and accelerometers imbedded in phones and tablets today – wasn't widely available when the IDIA Lab began working on the project two years ago.

Zehr and team created animations of the grandstand, the teepees and cabins that served as living quarters for the Wild West Show workers. Adam Kobitz and Trevor Danehy modeled the geometries in Maya 3D and used the 3D printer and laser cutter to construct the diorama pieces. The team used archival photos to triangulate to the nearest possible degree just where all the elements were placed in relation to each other.

The lab showed demos of the project, wowing audiences in the College of Architecture and Planning. Fillwalk expects to have the project installed in Cody by early summer.

- Christine Rhine, CAP

UPCOMING

IDIA Lab is under contract with the US Department of the Interior to develop augmented reality apps for Mesa Verde National Park. The partnership will heighten visitor experiences around the culture, history and archeology of the site.

A locative app is being developed by IDIA Lab for an architectural walking tour of Columbus, IN. The project is sponsored by BSU's Digital Scholarship Lab and is lead by CAP's Dr. Kristin Barry. The app allows visitors to learn about the buildings, architects and the legacy of Cummins on the city.

IDIA Lab is creating a virtual moon-base sandbox for an international consortium of space experts including Henk Rogers (Tetris), Buzz Aldrin, NASA and the European Space Agency. The group has also begun building a 1000-acre location in Hawaii for physical experimentation to prototype future lunar expeditions.

JEFF BERG: DIGITAL URBAN DESIGN

STEAM ARTIST TALK

IDIA Lab research fellow, Jeff Berg visited campus for a Digital Scholarship Lab lecture - jointly hosted by CAP. Berg is the Senior Digital Designer for Arup, an international urban planning, design and architecture firm. Jeff has unique experience with coding and design to create engaging end-user experiences for cultural, governmental and commercial entities around the world. https://www.arup.com

International artists, Evelina Domnitch and Dmitry Gelfand returned to BSU this past semester for a lecture in the College of Architecture and Planning. They are intermedia artists who exhibited in our Engaging Technology II exhibition at DOMA last year and also performed in our Charles Brown Planetarium. They create immersive art environments merging art and science. http://www.portablepalace.com

DIGITAL LANDSCAPE COURSE

ENVIRONMENTAL DRONE VIDEO
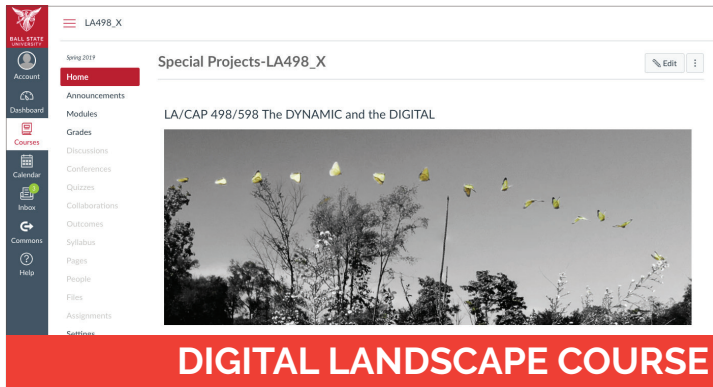
IDIA Lab is assisting Landscape Architecture professor Natalie Yates in the instruction of a new course: The Dynamic and the Digital, LA/CAP 498X/598X. This special topics course is available to all CAP students and explores approaches to virtual / augmented reality, immersive environments, 3D printing, drones and photogrammetry as methods of inquiry for design.

The Hoosier Environmental Council contracted with IDIA Lab to scan the entire stretch of the White River from Muncie to Indianapolis. The project, lead by our UAS certified pilot, Adam Kobitz will be integrated into a visualization illustrating multiple use cases for the river. HEC is Indiana's leading educator and advocate for environmental issues and policies. https://www.hecweb.org

ABOUT IDIA

The Institute for Digital Intermedia Arts explores of the intersections between the arts, sciences and technology. Scholarly, creative and pedagogical projects investigate virtual reality, Human Computer Interface, augmented reality, mobile apps, visualization and 3D simulation. The lab's staff and students develop collaborations in partnership with a host of international clients in this innovative studio initiative investigating the forefront of emergent media design and learning.

Institute for Digital Intermedia Arts / College of Architecture and Planning | Ball State University | Muncie, IN 47306
IDIA Lab: (765) 285-4325 | http://idialab.org