

IMMERSIVE EDUCATION INITIATIVE IMMERSIVE COLORADO



**VIRTUAL REALITY VIRTUAL WORLDS DOMES
3D PRINTING AUGMENTED REALITY GAMES**



August 23-26 : Denver & La Junta Colorado
ImmersiveEducation.org #i2016

IMMERSIVE COLORADO

23-26 August 2016
Colorado USA

Download a PDF version of this Abstracts document at:

<http://summit.ImmersiveEducation.org/Colorado>

(see "Program & Schedule of Events")

Table of Contents

IMMERSIVE COLORADO	03
HOSTS and DATES	07
PRESENTATIONS	08
PAPERS	24
DEMOS	25
WORKSHOPS	27
About the Immersive Education Initiative	41
About Immersive Education Summits	41

IMMERSIVE COLORADO

IMMERSIVE COLORADO addresses the personal, cultural and educational impact of immersive technologies such as Virtual Reality (VR), Augmented Reality (AR), 360 degree VR video, spherical panoramic photography, 3D printing, telepresence, virtual worlds, simulations, game-based learning and training systems, immersive teaching and immersive learning systems, and fully immersive environments such as caves, domes and planetariums.

IMMERSIVE COLORADO runs from the evening of August 23 through August 26 in collaboration with the **United States Department of the Interior (DOI)** in celebration of the 100th anniversary of the **USA National Park Service (NPS)**.

The conference features a unique format that spans two locations in Colorado: **Denver** and **La Junta**.



The event, which is open to the public, includes a series of hands-on **Virtual Reality (VR) workshops** during which attendees will create their very own VR experiences while touring **stunning Colorado landmarks** such as [Garden of the Gods](#), [Pikes Peak mountain](#) and historic [Bent's Old Fort](#) as they travel together from Denver to La Junta.

Transportation from Denver to La Junta on August 25th, the return trip on August 27th, and the Virtual Reality workshops that are conducted at Colorado landmarks along the way are included with the conference registration fee.

A personal Immersive Education Google Cardboard **VR headset** is also provided to all speakers, presenters and attendees.



Immersive Bent's Old Fort Virtual Ribbon Cutting Ceremony

During the conference speakers, presenters and attendees are invited to “cut the virtual ribbon” on [Immersive Bent's Fort](#), officially opening the Minecraft rendition of the historic fort to teachers, students and the general public. Participants will receive hands-on Minecraft training in advance of the ribbon cutting ceremony.

Known as the “Castle of the Plains,” [Bent's Old Fort](#) was a 1830s - 1840s adobe fur trading post on the mountain branch of the [Santa Fe Trail](#) where traders, trappers, travelers, and the Cheyenne and Arapaho tribes came together in peaceful terms for trade. A unique center of cultural exchange at the time, no less than seven different languages were spoken at the fort including English, Spanish, French, and numerous American Indian languages. Today, living historians recreate the sights, sounds, and atmosphere of the past with guided tours, demonstrations and special events.

On November 19, 2014, the Immersive Education Initiative announced that Bent's Old Fort would be **reconstructed virtually** in the video game Minecraft and also as a fully immersive 3D virtual reality (VR) environment.

One of several new activities under the Initiative's Immersive Arts and Culture program, Immersive Bent's Old Fort is being developed in collaboration with the United States Department of the Interior National Park Service, the City of La Junta Colorado, Otero Junior College, and Colorado's East Otero School District.

The [Immersive Bent's Old Fort](#) project has three primary goals:

1. Bring Bent's Old Fort to life using Immersive Education technologies to deeply engage K-12 students as they learn about American History in school.
2. Give high school and college students in Colorado a unique opportunity to learn how to develop [immersive learning](#) experiences using contemporary technology while simultaneously providing them with intimate first-hand knowledge about the fort.
3. Give Bent's Old Fort visitors a way to "return" to the fort virtually at any time and in an interactive and dynamic way that isn't possible with photographs or video.

The project began with the formation of two [new Immersive Education \(iED\) student clubs](#) in La Junta; one at Otero Junior College (OJC), and the other at La Junta High School. Students in both clubs meet weekly at OJC, where they work together to virtually reconstruct Bent's Old Fort.

Immersive Bent's Old Fort, along with corresponding history curricula and teaching materials, will be **available free of charge** to the general public and to schools around the world.

Online virtual tours of the immersive fort will be available to schools as a complement to the in-person tours currently conducted on-site at the fort by National Park Service rangers.

For details visit <http://ImmersiveEducation.org/fort>

Modular Conference Format

Immersive Education Summits (iED Summits) such as IMMERSIVE COLORADO are official Immersive Education Initiative conferences organized for educators, researchers, administrators, business leaders and the general public. iED Summits consist of presentations, panel discussions, break-out sessions, demos, hands-on workshops and hands-on professional development programs that provide attendees with an in-depth understanding of immersion, the technologies that enable immersion, and immersive teaching and learning techniques and best practices.

iED Summits feature new and emerging virtual worlds, virtual reality, game-based learning and training systems, simulations, mixed/augmented reality, fully immersive environments, immersive learning and training systems, cutting-edge research from around the world, and related tools, techniques, technologies, standards and best practices.

Building on the success of the previous 10 years of iED Summits, IMMERSIVE COLORADO will feature a **unique modular format** that premiered at [IMMERSION 2014](#) in Los Angeles, California, and [IMMERSION 2015](#) at Université Paris-Sorbonne (“the Sorbonne”) in Paris, France.

Speakers at previous iED Summits have included **United Nations**, NASA, **Harvard University**, MIT Media Lab, **Massachusetts Institute of Technology (MIT)**, **Smithsonian Institution**, Walt Disney Animation Studios, **Google**, Microsoft, **Intel**, United States Department of the Interior (DOI) National Park Service, **United States Department of Education**, UCLA, **Stanford University**, USC, and other world-class organizations and academic institutions.

Attendees are encouraged to review the previous 10 years of iED Summits at:

<http://summit.ImmersiveEducation.org>

HOSTS and DATES



IMMERSIVE COLORADO runs from the evening of August 23 through August 26 in collaboration with the **United States Department of the Interior (DOI)** in celebration of the 100th anniversary of the **USA National Park Service (NPS)**.

The conference features a unique format that spans two locations in Colorado: **Denver** and **La Junta**.

The [Denver Museum of Nature and Science](#) will host the Denver conference sessions on August 23rd and 24th. The conference begins with an opening reception and series of welcoming talks in the museum's Gates Planetarium on the evening of August 23rd, with conference sessions occurring at the museum the following day.

For details on the sessions that occur in Denver please refer to the "Gates Planetarium" presentations below (see **PRESENTATIONS** below).

On August 25th the **USA National Park Service** will host a special conference social event in the evening at historic [Bent's Old Fort](#) in La Junta, while [Otero Jr. College](#) will host conference sessions in La Junta on August 25th and 26th.

Transportation from Denver to La Junta on August 25th, the return trip on August 27th, and the Virtual Reality workshops that are conducted at Colorado landmarks along the way are included with the conference registration fee.

A personal Immersive Education Google Cardboard **VR headset** is also provided to all speakers, presenters and attendees.

PRESENTATIONS

Gates Planetarium Sessions

Registration is Open

[DETAILS](#)

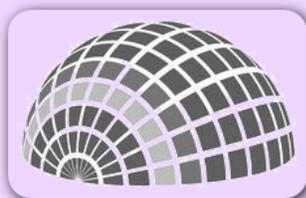
[REGISTER](#)



Gates Planetarium Sessions

The **Denver Museum of Nature and Science** will host the Denver conference sessions on the evenings of August 23rd and August 24th. The conference begins with an opening reception and series of welcoming talks in the museum's planetarium ("dome") on the evening of August 23rd, with conference activities and sessions occurring in downtown Denver the following day and at the museum that evening.

All sessions at the **Denver Museum of Nature and Science** take place in the Gates Planetarium. A planetarium, or dome, is a special-format theater designed for presenting educational content. Although most people think of planetariums only in the context of astronomy and laser-light shows, they provide a unique and powerful environment for a wide range of Immersive Education experiences.



Mobile Domes: Schools and companies can rent "mobile domes" that can be delivered and used anywhere in the world. Mobile domes are typically constructed of inflatable fabric, and can be installed in gymnasiums, lunch rooms, parking lots, or even playgrounds.

The following **IMMERSIVE COLORADO** sessions will be presented in the Gates Planetarium (dome) at the museum on the evenings of August 23rd and August 24th:

- Immersive Bent's Old Fort: Immersive History and Culture
- NeuroDome: A Hitchhikers Guide to the Brain
- Digital Earth: Colorado Ecology in the Anthropocene
- Dome Games: Engaging Students in Immersive Learning
- Dome Video Jockey (VJ): Real-time Video Mixing in the Dome
- Immersive Storytelling in the Dome
- Drama Under the Dome: Boulder Ensemble Theater Company
- 360° Storytelling: Teaching students panoramic photography to tell stories in immersive formats
- Virtual Museum: Students creating & curating a museum that can be used in VR or domes
- Rio Verde Archaeology: Virtual Field Experience (Oaxaca, Mexico)

Keynotes, Presentations, Workshops, Papers, Posters, Demos and Exhibits!

Denver sessions that occur in the Gates Planetarium are detailed below.

Immersive Bent's Old Fort: Immersive History and Culture

Rick Walner¹, Martin Knifechief¹, Michael Schaub¹

Aaron E. Walsh^{2,3}, Meagan Hotchkiss-Trejo⁴

Affiliations:

¹United States Department of the Interior (DOI) National Park Service (NPS)

²Immersive Education Initiative (iED)

³Boston College, USA

⁴Otero Junior College, USA

Bent's Old Fort was a 1830s - 1840s adobe fur trading post on the mountain branch of the Santa Fe Trail where traders, trappers, travelers, and the Cheyenne and Arapaho American Indian tribes came together in peaceful terms for trade. Bent's Old Fort served as an instrument of Manifest Destiny and a catalyst for change in the United States. The fort's influence with the Plains Indians and its political and social connections in Santa Fe helped pave the way for the U.S. occupation of the West and the annexation of Mexico's northern province during the U.S.-Mexican War.

Today, living historians recreate the sights, sounds, and atmosphere of the past with guided tours, demonstrations and special events. In addition to being a popular tourist attraction, Bent's Old Fort is also an important aspect of elementary school education in Colorado. The fort is part of the core curriculum for 4th grade students in Colorado.

On November 19, 2014, the Immersive Education Initiative announced that Bent's Old Fort would be reconstructed virtually in the video game Minecraft and also as a fully immersive 3D virtual reality (VR) environment. One of several new activities under the Initiative's Immersive Arts and Culture program, Immersive Bent's Old Fort is being developed in collaboration with

the United States Department of the Interior National Park Service, the City of La Junta Colorado, Otero Junior College, and Colorado's East Otero School District.

The [Immersive Bent's Old Fort](#) project has three primary goals:

1. Bring Bent's Old Fort to life using Immersive Education technologies to deeply engage K-12 students as they learn about American History in school.
2. Give high school and college students in Colorado a unique opportunity to learn how to develop [immersive learning](#) experiences using contemporary technology while simultaneously providing them with intimate first-hand knowledge about the fort.
3. Give Bent's Old Fort visitors a way to "return" to the fort virtually at any time and in an interactive and dynamic way that isn't possible with photographs or video.

The project began with the formation of two [new Immersive Education \(iED\) student clubs](#) in La Junta; one at Otero Junior College (OJC), and the other at La Junta High School. Students in both clubs meet weekly at OJC, where they work together to virtually reconstruct Bent's Old Fort.

In this opening series of presentations we will give attendees a unique overview of Bent's Old Fort, followed by an overview of the Immersive Bent's Old Fort project that includes an overview of Immersive Education (iED) (see "Inside Immersive Education" below).

Inside Immersive Education

Aaron E. Walsh^{1,2}

Affiliations:

¹Immersive Education Initiative

²Boston College, USA

The Immersive Education Initiative is a non-profit international collaboration of educational institutions, research institutes, museums, consortia and companies. The Initiative was established in 2005 with the mission to define and develop standards, best practices, technology platforms, training and education programs, and communities of support for Virtual Reality (VR), virtual worlds, augmented and mixed reality, simulations, game-based learning and training systems, and fully immersive environments such as caves and domes. More recently, the Initiative has endorsed creative computing systems, holograms, 3D Printing, robotics and drones as official Immersive Education (iED) technologies.

Today the thousands of faculty, researchers, staff and administrators who are members of the Immersive Education Initiative together service millions of academic and corporate learners worldwide.

In this talk, which is part of the opening Immersive Bent's Old Fort presentations (see above), Immersive Education Initiative Director Aaron E. Walsh will give attendees an overview of the wide range of immersive technologies that are used for teaching and learning along with examples of how these technologies are used around the world at all levels of education today.

NeuroDome: A Hitchhiker's Guide to the Brain (Virtual Presentation via Dome Telepresence)

Jonathan Fisher¹

Affiliations:

¹New York Medical College

We conceptualize and learn complex landscapes in large part through “route-based” mapping, the memory of sensory experiences and landmarks discovered during spatial exploration. Immersive visualization environments such as dome projection or head-mounted display provide viewers with a route-based learning experience because they induce the feeling of physically moving through virtual environments.

This effect has been leveraged in educational settings for conveying complex spatial concepts, particularly for teaching astronomy. However, despite the ubiquity of digital dome technology and its documented educational merit, its utility in depicting biological landscapes has remained largely unexplored.

In this presentation, I present some of our work applying these concepts to real, three-dimensional neuroimaging data. We find that in addition to learning about two-dimensional landscapes, real-time, exploratory touring is also effective for teaching complex, three-dimensional anatomical structures at scales that vary by up to four orders of magnitude.

Virtual Session: For this virtual presentation the presenter appears in the dome via telepresence.

Digital Earth: Colorado Ecology in the Anthropocene

Bob Raynolds¹, Ka Chun Yu¹

Affiliations:

¹Denver Museum of Nature and Science (DMNS)

Colorado's ecological framework is established by topography and water supply. Colorado is the Headwaters State, with rivers flowing from us in all cardinal directions. Our water arrives as snow on our mountain-tops and is stored there, melting slowly and watering our valleys. As much of the moisture arrives from the Pacific, snowfall is concentrated on the western side of the Continental Divide, with much of the eastern side of the state in a rain shadow. In this shadow dwell most of Colorado's 5.5 million people.

Surface cover mapping can be used to define the framework of Colorado's ecology. The eastern High Plains are relatively arid, supporting dry-land farming and irrigated agriculture along drainages. The Foot Hills of the Front Range are rapidly urbanizing. The Rocky Mountain slopes are covered in deciduous and coniferous forests. Above timber-line, our mountain peaks rise to 14,000 feet and feature tundra conditions.

The ecosystems of Colorado are dynamic. Warming temperatures are moving boundaries to higher elevations; fauna and flora are being affected. As winters warm and forests are stressed by drought, a variety of beetles and moths are attacking trees. Huge areas of forest lie dead and trees topple in the wind. Insecticide is applied by helicopter without clear signs of success. Headwater conditions are being adversely impacted and water storage diminished. Fire risk is rising and post-fire run-off and landslides fill our reservoirs with debris.

As our population is drawn to urban areas, resources can be used more efficiently in concentrated areas and rural areas can be given respite. Increased knowledge of species distributions and habitat requirements are leading to better planning of wildlife migration

corridors, highway crossings, fish management, and open space purchases. Areas of Colorado have seen re-wilding by bison, moose and mountain sheep. Our ecosystems are resilient yet regional changes will continue to challenge their capacity to maintain the biological and recreational services we have grown accustomed to.

DENVER SESSION

Immersive Gaming in the Dome

Ethan Bach¹, Michael Sperandeo¹, Eric Davis¹

Affiliations:

¹Alt Ethos

Alt Ethos is an immersive media studio that will showcase interactive demo projects in the Gates Planetarium. The digital dome (planetarium) offers a unique immersive group experience with its hemispherical screen, high resolution digital projection system, and surround sound. With recent innovations that allow for drag and drop playback, live VJing (Video Jockey'ing), interactivity, and gaming platforms, the virtually untapped possibilities in the digital dome are endless.

Alt Ethos works to actualize the potential of this and other immersive technologies. Involution will be performed by Michael Sperandeo and Eric Davis presenting gaming and VJing capabilities in the dome. Spellbound will demonstrate an immersive game originally produced for VR using gestural navigation with Leap Motion.

Additionally, Alt Ethos will speak on their creative praxes and how it specifically pertains to gaming platforms, audience participation, and experiential design.

Samskara

Ben Gondrez¹

Affiliations:

¹Fort Collins Museum of Discovery

Samskara is a 360° fulldome art piece created by acclaimed digital artist Android Jones in partnership with FullDome Lab. This immersive artwork is a beautiful mesh of fractals, pixels, and digital bits that form together to create Eastern-inspired immersive art based on the visual artwork of Jones.

Jones, along with the artists at FullDome Lab, were able to transform his artwork into three-dimensional worlds that allow audiences to experience the inner depths of the artist's mind while staring up into the unending universe provided by the 360° planetarium dome.

By opening up their doors to artworks and performances like these, museums around the world are reaping the benefits of attracting entirely new audience bases. Through the act of allowing and even fostering creative expression, museums and planetariums are creating unique ways to connect with audiences that normally would not engage with these types of institutions, and to make meaningful connections with diverse people in their communities.

Additionally, museums and other educational institutions can utilize artistic experiences like Samskara to connect learning in critical areas like science, mathematics, and engineering with arts practices, design principles, and aesthetics to provide a full package of learning.

Immersive Storytelling and Filmmaking in Digital Domes

Dan Neafus¹, Ka Chun Yu¹

Affiliations:

¹Denver Museum of Nature and Science (DMNS)

The digital “fulldome” video theater is a young medium that is the result of a convergence of planetariums, large format cinema, computer visualizations, and virtual reality. The large screen size, wide field-of-view, and capacity for group experiences makes fulldome theaters unique venues for education, storytelling, and performance.

Yet the unique properties of the medium also requires re-thinking the approaches to storytelling and filmmaking. We review the latest research showing how fulldome imagery impacts learning by reducing cognitive load and increasing viewer attention.

We discuss how audiences experience storytelling in fulldome and conventional cinema differently. Finally, we demonstrate solutions filmmakers have developed to capture focus and direct audience attention within a “frameless” visual environment.

Vera Rubin: Bringing the Dark to Light

Stephen Wertz¹, Heather Beasley¹

Affiliations:

¹Boulder Ensemble Theater Company

Fiske Planetarium and the Boulder Ensemble Theatre Company recently co-produced "Vera Rubin: Bringing the Dark to Light," a 45-minute theatrical production inside a fulldome planetarium.

Integrating live theatrical production with immersive fulldome technology creates exciting opportunities for compelling content, as well as cross-disciplinary challenges in controlling storytelling.

We will describe what worked, what didn't, and the future potential of integrating theatre and planetarium shows for education and entertainment.

Habitat Earth in the Classroom

Ryan Wyatt¹

Affiliations:

¹California Academy of Sciences

Many museums and science centers invest significant resources in creating or curating planetarium shows, but these impressive immersive experiences typically last only 25 minutes.

How can museums capitalize on a show's affective gains to have educational impacts well beyond its screening?

Wyatt will describe how the California Academy of Sciences has extended the learning potential of its award-winning production Habitat Earth, interspersing scenes from the film with a preview of resources designed for educators and students.

360° Storytelling

Terry Burton¹

Affiliations:

¹Fort Collins Museum of Discovery

Utilizing panoramic photography techniques, the Fort Collins Museum of Discovery has been offering week-long summer workshops for middle school students to introduce them to telling immersive stories in our OtterBox Digital Dome Theater.

We take the students on a journey of discovery and learning about what exactly makes 360° storytelling different than traditional flat-screen formats. After learning about the unique traits of dome and VR storytelling we put professional tools in their hands and provide training in the specialized techniques required for production in this unique format.

Once they are fully equipped, the students are able to utilize the tools and techniques they have learned to create hilarious, moving, and sometimes even inspiring moments.

LA JUNTA SESSION

Immersive Education Clubs and Camps

Barbara Mikolajczak^{1,2}

Affiliations:

¹Immersive Education Initiative

²Boston College, USA

Immersive Education (iED) Clubs and Camps engage learners of all ages and levels (K-12, college, university and corporate professionals) using a range of immersive learning technologies. iED Clubs and Camps may focus exclusively on the use of one specific form of immersive learning technology (such a Virtual Reality, Minecraft, or Scratch, for example) or any combination of technologies.

Immersive Education technologies "immerse" and engage learners in a way that is not possible with traditional teaching and training methods. Virtual reality (VR), virtual worlds, game-based learning systems, simulations, augmented reality (AR), fully immersive environments (such as caves and domes), creative computing systems, holograms, personal robotics and drones, and 3D printing are among the Immersive Education technologies that elementary schools, high schools,

colleges, universities and companies around the world are using to fundamentally change the way students and employees learn.

iED Clubs and Camps may be integrated directly into existing classes and curricula (offered as part of your normal school day) and professional work days, or they may held at lunch-time, after-school, on weekends or over the summer.

This presentation will provide attendees with an overview of iED Clubs and Camps around the world, and provide instructions on how start and run an iED Club or Camp at your own school, university or organization.

Empowerment Through Creative Technology

E. Bach¹

Affiliations:

¹Denver Arts + Technology Advancement

Digital Media is the most powerful form of communication yet the knowledge of digital literacy and the tools remains out of reach of most people. Emerging creative technologies are kept in elite groups and barricaded by bureaucracy and incompatible missions. As we continue to look into the future, we still experience an overwhelming majority of the dominant culture creating our entertainment content, our tools of communication, and our art. This artist and entrepreneur sees a different future.

Denver Arts + Technology Center (DATA) is working to create a vanguard center for public engagement that cultivates and strengthens local community by putting research, education, creation and exhibition together under the same roof with interactive immersive media at its center. DATA currently provides an annual international digital dome artist in residence and will soon launch a K-12 curriculum and a monthly public immersive media lab.

DATA's mission is "Empowerment Through Creative Technology" and once the facilities are established, will be open to research for developing art, technologies, and advanced immersive learning methods.

Augmented Reality as an Interaction with Children for Extending the Game of Waste Recycling

S. Keller Fuchter¹, T. Pham², M. S. Schlichting¹

Affiliations:

¹Central State University of the South (Centro Universitário Estacio de Sá), Brazil

²TUniversity of Talca in Talca, Chile

This paper presents the learning experience made with augmented reality as a technique of disclosure, interaction, and communication with the children. The scope of the learning experience is to promote the concept of recycling and sustainability of the environment.

It is believed that learning the concept of social responsibility at an early age has a more profound impact on the memory of a person. Therefore, 100 children of ages from 6 to 12 years old were selected to play the game designed to introduce the concept of recycling. Their understanding of the concept of recycling was evaluated through the administering of a brief questionnaire immediately after the game asking about the memorization and understanding of the concept of recycling.

The data of the responses was collected and analyzed, showing that the game was enjoyable, the learning effective, and the memorization of key concepts achieved.

DEMOS

LA JUNTA SESSION

Using Virtual Reality to Teach STEAM Curriculum

Gary Murphy¹

Affiliations:

¹zSpace, Inc.

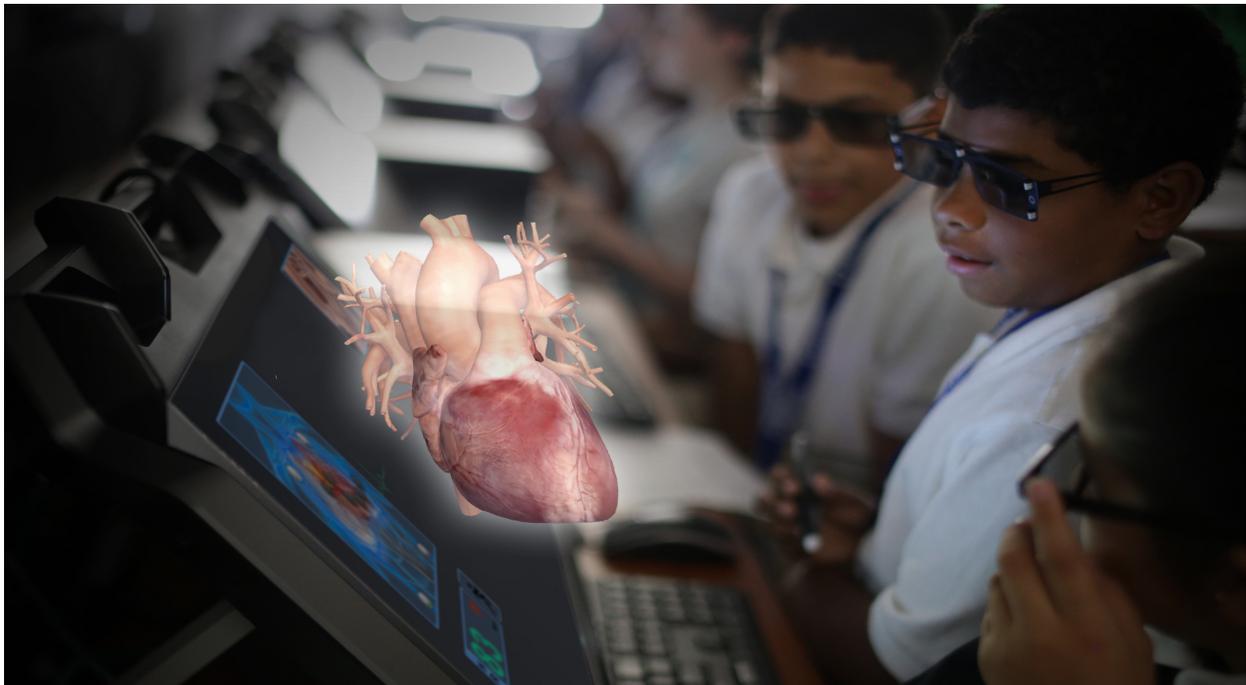
A Virtual Reality STEAM (Science, Technology, Engineering and Math) Lab immediately invokes curiosity as it allows students to create, test and experiment in an interactive, 3D environment. Students know computers, they've seen 3D movies, but now they can pick up, manipulate and explore 3D images, which can be "lifted" from the screen. Through interactive 3D visualization, attendees will learn how today's students in over 400 K-12 schools and universities are interacting with virtual environments to discover STEAM concepts, such as the complexity of human anatomy or the components of a simple engine, in ways often impractical or impossible in the real world.

This demonstration will show participants how screen-based virtual reality technology is used to teach STEAM content in order to impact student learning. As participants learn how hundreds of thousands of students in over 400 school districts, universities and medical school today are already using the technology in collaborative, virtual reality lab environments, they will get a demo experience using zSpace screen VR hardware and standards-aligned STEAM software in a classroom setting complete with instructor augmented reality station.

A zSpace virtual reality STEAM computer will be placed at the front of the room, which will be connected to the projector. The zSpace computer is outfitted with head-tracking eyewear and an interactive stylus, as well as a wide variety of educational software ranging from science and physics to engineering. The projector will display an augmented reality view of the user's experience in front of the zSpace computer for the entire audience to see. Attendees will get a first hand view of how today's students are dissecting human hearts and troubleshooting circuit boards - without having to worry about limited supplies or safety.

Attendees will:

- Receive a demonstration with a virtual and augmented reality STEAM computer
- Learn how exploration and student-directed approaches in VR support active and deep learning, ultimately inspiring students into STEAM careers
- Discover how virtual reality redefines learning by doing experiences in the classroom, while increasing interaction and expanding social engagement



Using Virtual Reality to Teach STEAM Curriculum: Students at Fondren School try Screen Virtual Reality (VR) in their school's STEAM Lab.

WORKSHOPS

Virtual Reality (VR) in Colorful Colorado
Registration is Open

DETAILS

REGISTER

Capture your Colorado memories in VR!

IMMERSIVE COLORADO features a unique format that spans two locations in Colorado: **Denver** and **La Junta**.



The event, which is open to the public, includes a series of hands-on **Virtual Reality (VR) workshops** during which attendees will create their very own VR experiences to "capture and preserve the moments" as we tour **stunning Colorado landmarks** such as [Garden of the Gods](#), [Pikes Peak mountain](#), historic [Bent's Old Fort](#), the famous [Koshare Indian Dancers](#) and local farmer's markets while we travel together as a group from Denver to La Junta and back.

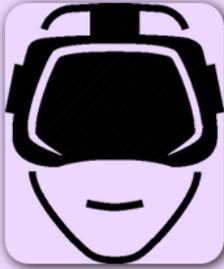


Mobile VR: Learn how to use your mobile phone to capture 360° VR scenes of the world around you, and then use these skills in your classroom or company when you get home. Mobile VR is convenient, inexpensive and ideal for engaging students and employees in a fun & cost effective manner.

The **Denver Museum of Nature and Science** will host the Denver conference sessions on the evenings of August 23rd and August 24th. The conference begins with an opening reception and series of welcoming talks in the museum's planetarium on the evening of August 23rd, with conference activities and sessions occurring in downtown Denver and at the museum the following day.

On August 25th the **USA National Park Service** will host a special conference social event that features hands-on workshops in the evening at **historic Bent's Old Fort** in La Junta, while **Otero Jr. College** will host conference sessions in La Junta during the day on August 25th and August 26th.

Transportation from Denver to La Junta on August 25th, the return trip on August 27th, and the Virtual Reality workshops that are conducted at Colorado landmarks along the way are included with the conference registration fee.



Bring it home! A personal **Immersive Education (iED) Google Cardboard VR headset** is provided to all attendees. Your iED VR headset is yours to keep and bring home after the conference so that you can relive the Colorado memories that you capture in VR, and also so that you can enjoy **thousands** of new and emerging VR experiences **free of charge** once you get home.

During the conference speakers, presenters and attendees are invited to "**cut the virtual ribbon**" on [Immersive Bent's Fort](#), officially opening the Minecraft rendition of the historic fort to teachers, students and the general public. Participants will receive hands-on Minecraft training in advance of the ribbon cutting ceremony (see "[Virtual Ribbon Cutting Ceremony](#)" below for details).

Keynotes, Presentations, Workshops, Papers, Posters, Demos and Exhibits!

Virtual Ribbon Cutting Ceremony
Registration is Open

DETAILS

REGISTER



Immersive Bent's Fort Virtual Ribbon Cutting

As an **IMMERSIVE COLORADO** attendee you are cordially invited to "cut the virtual ribbon" on [Immersive Bent's Fort](#), officially opening the Minecraft rendition of the historic fort to teachers, students and the general public. You will receive hands-on Minecraft training in advance of the ribbon cutting ceremony, **after which we'll visit the historic fort itself** for a special social event, hands-on Virtual Reality (VR) workshops, and a sunset dessert treat prepared for us by the Santa Fe Trail Dutch Oven Cookers (see ["IMMERSIVE MEAL" Social and Networking Event](#) below for details).

You will also be given early and exclusive access to brand-new 360° VR video renditions of the fort, and be taught how to create your own 360° degree VR videos, still-image 360° panoramas, and gigapixel spherical photographs in HDR (high dynamic range) at the fort itself that same evening (see ["IMMERSIVE MEAL" Social and Networking Event](#) below).

Known as the "Castle of the Plains," [Bent's Old Fort](#) was a 1830s — 1840s adobe fur trading post on the mountain branch of the [Santa Fe Trail](#) where traders, trappers, travelers, and the Cheyenne and Arapaho tribes came together in peaceful terms for trade. A unique center of cultural exchange at the time no less than seven different languages were spoken at the fort including English, Spanish, French, and numerous American Indian languages. Today, living historians recreate the sights, sounds, and atmosphere of the past with guided tours, demonstrations and special events.

[Bent's Old Fort](#) served as an instrument of [Manifest Destiny](#) and a catalyst for change in the United States. The fort's influence with the Plains Indians and its political and social connections in Santa Fe helped pave the way for the U.S. occupation of the West and the annexation of Mexico's northern province during the U.S.-Mexican War. Along with El Camino Real, the Santa Fe Trail was part of a trade network linking Europe, New York, and St. Louis with Santa Fe and Mexico City. Opened in 1821, the Santa Fe Trail followed old trade routes established by American Indians that were later used by Spanish, Mexican and American troops, traders and other travelers.



On November 19, 2014, the [Immersive Education Initiative](#) announced that Bent's Old Fort would be reconstructed virtually in the video game **Minecraft** and also as a fully immersive 3D **Virtual Reality (VR)** environment.

One of several new activities under the [Initiative's Immersive Arts and Culture](#) program, [Immersive Bent's Old Fort](#) is being developed in collaboration with the **United States Department of the Interior National Park Service (DOI NPS)**, the **City of La Junta Colorado**, **Otero Junior College**, and Colorado's **East Otero School District**.

The [Immersive Bent's Old Fort](#) project has three primary goals:

1. Bring Bent's Old Fort to life using Immersive Education technologies to deeply engage K-12 students as they learn about American History in school.
2. Give high school and college students in Colorado a unique opportunity to learn how to develop immersive learning experiences using contemporary technology while simultaneously providing them with intimate first-hand knowledge about the fort.
3. Give Bent's Old Fort visitors a way to "return" to the fort virtually at any time and in an interactive and dynamic way that isn't possible with photographs or video.

The project began with the formation of two [new Immersive Education \(iED\) student clubs](#) in La Junta; one at Otero Junior College (OJC), and the other at La Junta High School. Students in both clubs meet weekly at OJC, where they work together to virtually reconstruct Bent's Old Fort.



Minecraft: The first virtual rendition of the fort was created using the video game Minecraft. With over 100 million registered players, Minecraft is one of the most popular video games in history and is especially popular with elementary school students (making it ideal for engaging the very students who are the target audience of this project).

As they concluded construction of the Minecraft rendition of the fort the La Junta iED Club students engaged in an [international Immersive Cultural Exchange](#) with iED Club students in **Melbourne, Australia**. Now that the Minecraft version of the fort is complete the La Junta iED Clubs will begin to develop a fully immersive Virtual Reality rendition using professional 3D video, animation, modeling and simulation tools.

[Immersive Bent's Old Fort](#), along with corresponding history curricula and teaching materials, will be available **free of charge** to the general public and to schools around the world.

Online virtual tours of the immersive fort will be available to schools as a complement to the in-person tours currently conducted on-site at the fort by **National Park Service rangers**. For details visit <http://ImmersiveEducation.org/fort>

Keynotes, Presentations, Workshops, Papers, Posters, Demos and Exhibits!

The Famous Koshare Indian Dancers

Registration is Open

DETAILS

REGISTER

Capture the Koshare Indian Dancers in VR!

Capture and preserve your Koshare memories in Virtual Reality (VR), one of the "VR in Colorful Colorado" workshops, while you enjoy a special [Koshare Indian Dancers](#) performance, tour the Koshare Indian Museum exhibits, shop in the trading post, and drink in the atmosphere of the unique and authentic Koshare Kiva.

The [Koshare Indian Dancers](#) are members of Boy Scout Troop 232 and Venturing Crew 2230 of the Rocky Mountain Council, Boy Scouts of America. The Koshare Indian Dancers began in 1933 as a small group of Boy Scouts interested in Indian Lore, led by J.F. "Buck" Burshears (1909 — 1987). A visionary Scoutmaster, Burshears is considered one of the best Scoutmasters in Boy Scout history. Buck would end up serving his La Junta troop for fifty-five years.



The Koshares perform between 50 and 60 shows a year. Their dances and shows are recognized by Native American dancers as authentic representations of Native American dance; both historically and culturally accurate. In addition to their Summer and Winter Ceremonials and other shows at home, the Koshare Indian Dancers give special performances around the world.

The Koshares have traveled from coast to coast, to Madison Square Garden in New York to a U.S. air craft carrier a hundred miles at sea off San Diego. They also take numerous trips throughout the year to Native American Pow-Wows and Feast Days at New Mexico Pueblos. The Koshares have been recognized and accepted by the Native American community — the highest honor bestowed on a non-Indian group.



The [Koshare Indian Museum](#) is a registered site of the Colorado Historical Society in La Junta, Colorado. The building, located on the Otero Junior College campus, is a tri-level museum with an attached kiva that is built with the largest self-supporting log roof in the world. The building was built in 1949.

The museum features works of Pueblo and Plains tribal members. The museum also facilitates Boy Scouts traveling to Philmont Ranch by providing museum discounts, as well as hostel stays for visiting Boy Scout troops.

Koshare Indian Dancers are members of Boy Scout Troop 232 in the Rocky Mountain Council of the Boy Scouts of America, located in La Junta, Colorado. They have been performing their interpretations of Native American dance since 1933.

[Keynotes, Presentations, Workshops, Papers, Posters, Demos and Exhibits!](#)

Location-based Scavenger Hunts

Registration is Open

[DETAILS](#)

[REGISTER](#)

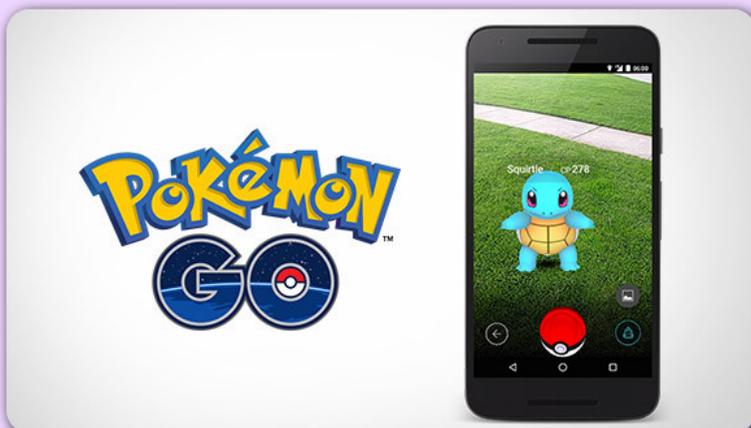
Location-based Scavenger Hunt and Workshop

Bring your mobile phone and a keen sense of adventure! Join the experts, meet new colleagues, and make new friends from around the world as you explore the city around you during this **unique social event and hands-on workshop** conducted in downtown Denver and La Junta.



A prelude to the **IMMERSIVE COLORADO** evening sessions that take place in the Denver Museum of Nature and Science planetarium on August 24th, the location-based scavenger hunt in downtown Denver that same afternoon involves real-time problem solving, exploration and orientation activities, and friendly team-based competition that leads to a golden treasure.

The Denver scavenger hunt social event and "user interface" workshop is complimented by an in-depth **hands-on workshop** in La Junta on August 26th during which you will learn how to create your very own location-based scavenger hunts for a wide variety of purposes (such as school and campus orientation programs, team-building exercises, student and employee engagement, interactive history and social studies, "gamified" education experiences, and more).



Pokémon Go! The location-based scavenger hunt social event and workshops include Pokémon Go, the world's most popular **Augmented Reality (AR)** app.

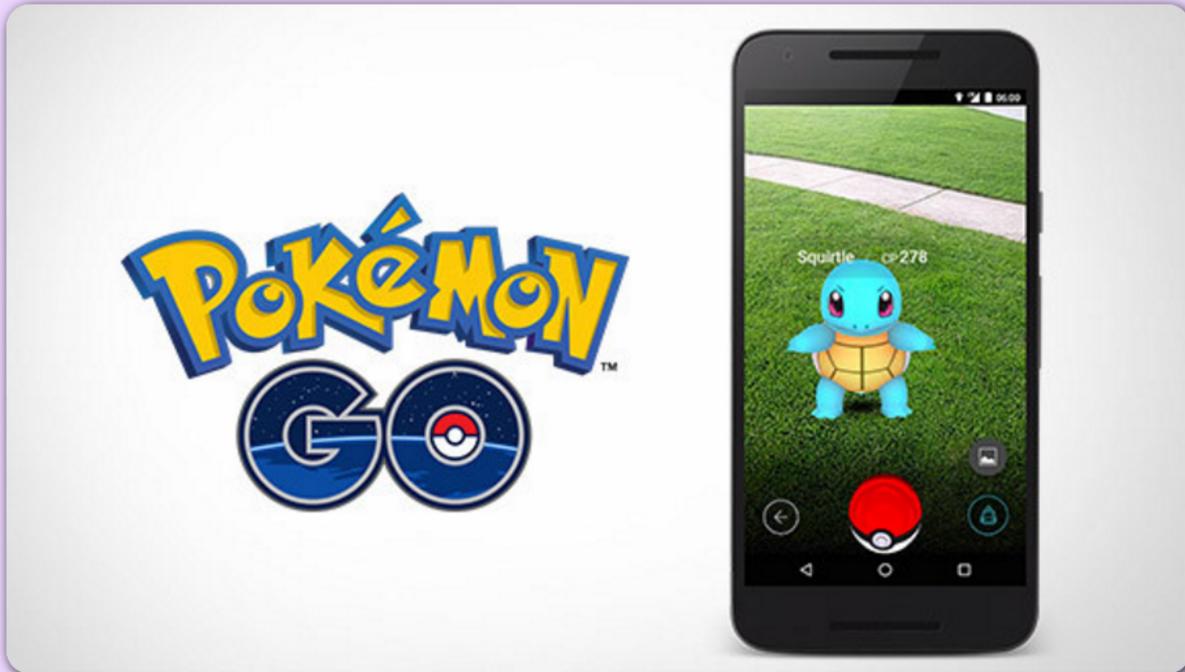
For details on how the Pokémon Go workshop will address **Pokémon Go as an educational and**

business tool check back later for the Pokémon Go module that will appear below.

Keynotes, Presentations, Workshops, Papers, Posters, Demos and Exhibits!

Pokémon Go Workshops
Registration is Open

DETAILS
REGISTER



Pokémon Go for Education and Business

Pokémon Go is the **world's first** truly mass-market mainstream application of Augmented Reality (AR), and one of the most successful games in history. It is, in fact, one of the **most wildly popular apps ever created** and is played daily by millions of people around the globe.

At IMMERSIVE COLORADO you'll be **one of the first in the world** to learn first-hand how the Pokémon Go phenomenon can be harnessed for education and business.



Bring it home! As an **IMMERSIVE COLORADO** attendee you will have exclusive early access to the preliminary edition of the [Immersive Education Initiative's](#) guidelines and best practices for Pokémon Go, which you can use immediately at your own school or business following the conference.

During the **Location-based Scavenger Hunt in Denver** (see "[Location-based Scavenger Hunts](#)" above) you will have the option of playing Pokémon Go (or simply watching others play, if you'd prefer not to play it yourself). You'll also be taught the fundamentals of playing Pokémon Go via the location-based mobile app that we'll use during the scavenger hunt.

As we travel together from **Denver to La Junta** we'll play Pokémon Go, with a **sharp focus on using the game for education and business**, at the very same Colorado landmarks that we capture in Virtual Reality (such as [Garden of the Gods](#), [Pikes Peak mountain](#), and historic [Bent's Old Fort](#)).

During a corresponding workshop in La Junta we'll discuss specific features and mechanics of the game with our fellow educators and business professionals as we draft in real time the [Immersive Education Initiative's](#) preliminary **guidelines and best practices** for Pokémon Go.

The Pokémon Go workshops address the following topics, and conclude with a drafting of the preliminary edition of the [Immersive Education Initiative's](#) guidelines and best practices for Pokémon Go that **you can use immediately** at your own school or school or business following the conference:

- Pokémon Go for Teachers and Education
- Pokémon Go for Business and Marketing
- Child-safety: Criminal Elements & Physical Safety
- Legal issues with Pokémon Go and other forms of Augmented Reality (AR)
- Pokémon Go for Student and Employee Engagement
- Pokémon Go for Team Building and Relationship Building
- Pokémon Go for Exercise and Socialization
- Pokémon Go for Geography, Spatial Awareness and Map-reading
- Pokémon Go as a Resource Management Simulator
- Pokémon Go for Teaching Math, Estimation and Conversions
- Incorporating Pokémon Go into Curricula and Lesson Plans
- Inquiry-based learning (IBL) with Pokémon Go
- Project-based learning (PBL) with Pokémon Go

Keynotes, Presentations, Workshops, Papers, Posters, Demos and Exhibits!

Structure Sensor 3D Scanner Workshop
Registration is Open

DETAILS
REGISTER



Rapid 3D Scanning, 3D Maps of Interior Spaces, and Augmented Reality

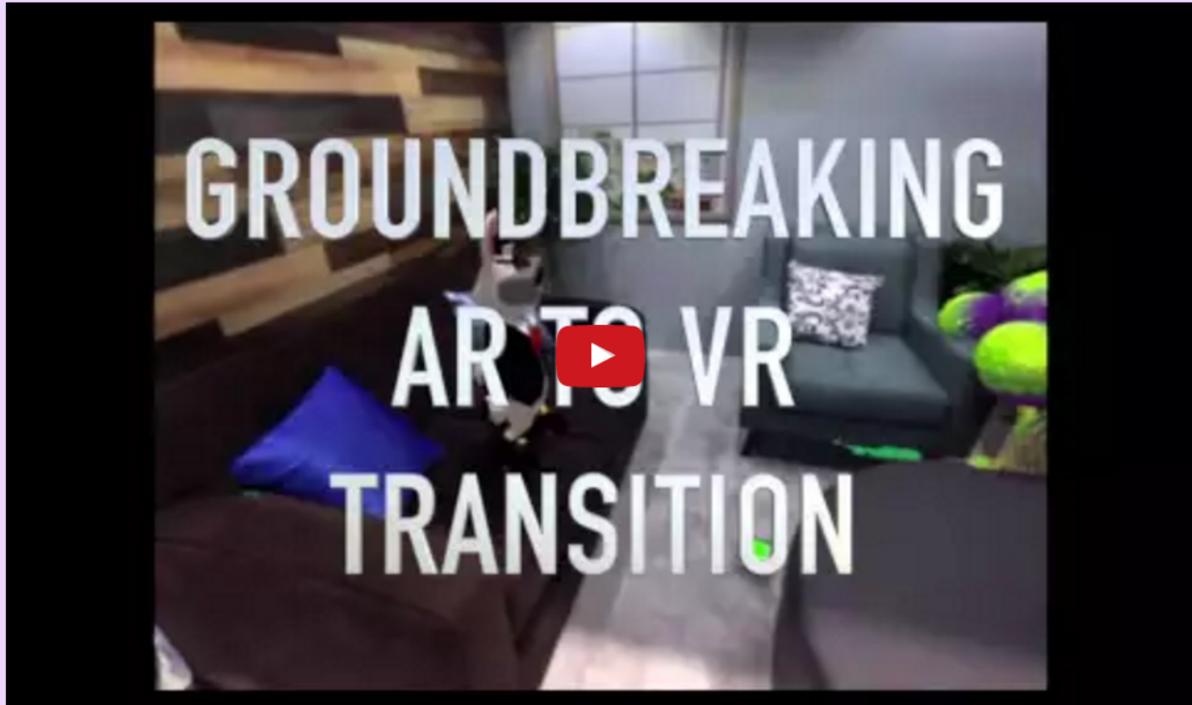
This hands-on workshop in La Junta will introduce you to [Structure Sensor](#), an affordable hardware device that transforms your iPad into a powerful mobile 3D scanner and Augmented Reality tool.

Capture detailed 3D models: When used as a 3D scanner, Structure Sensor allows you to capture dense geometry in real-time. This enables you to simulate real world physics and create high-fidelity 3D models with high-resolution textures in seconds.

Capture entire rooms all at once: The magic of 3D depth sensing begins with the ability to capture fast, accurate, dimensions of objects and environments. Structure Sensor doesn't merely capture one dimension; it captures everything in view, all at once.

Create new AR experiences: Bridge Engine makes it simple to author and deploy Augmented Reality experiences to the mobile device you already own. Coupled with Structure Sensor's ability to capture dense 3D meshes of scenes, you can create

virtual experiences that are difficult to distinguish from reality.



Keynotes, Presentations, Workshops, Papers, Posters, Demos and Exhibits!

"IMMERSIVE MEAL" Social and Networking Event
Thursday Evening Special Social & Networking Event

[DETAILS](#)

This activity occurs at Bent's Old Fort the evening of August 25

[REGISTER](#)



Join the experts, meet new colleagues and make new friends from around the world during this unique social and networking event at historic [Bent's Old Fort](#).

As we enjoy a sunset dessert treat prepared specially for us by the **Santa Fe Trail Dutch Oven Cookers** you'll have the opportunity to use different cameras and equipment to **shoot your very own 360° Virtual Reality (VR) videos**, still-image 360° VR panoramas and partial-scene VR panoramas, and gigapixel spherical photographs (extremely large high-resolution interactive panoramic photos) in high dynamic range (HDR).

Capture and preserve your memories of our time together at the fort while gaining valuable **hands-on "shooting" experiences** that are complimented by corresponding **hands-on "stitching" and content preparation workshops** the following day (August 26th). On the 26th you might also have the opportunity to experiment with a new generation of mobile **structural sensor scanners** that are capable of creating **virtual 3D objects** by scanning the real world around us.

Bring-your-own! You are encouraged to bring your own immersive technologies to share with others during the evening social event. Please note, however, that due to the historic nature and remote location of the fort that neither WiFi nor mobile phone service are available at the fort. As such, any technologies that you bring to the fort to share with your fellow conference attendees should not require network access.



Known as the "Castle of the Plains," [Bent's Old Fort](#) was a 1830s — 1840s adobe fur trading post on the mountain branch of the [Santa Fe Trail](#) where traders, trappers, travelers, and the Cheyenne and Arapaho tribes came together in peaceful terms for trade. A unique center of cultural exchange at the time no less than seven different languages were spoken at the fort including English, Spanish, French, and numerous American Indian languages. Today, living historians recreate the sights, sounds, and atmosphere of the post with guided tours, demonstrations and special events.

[Bent's Old Fort](#) served as an instrument of [Manifest Destiny](#) and a catalyst for change in the United States. The fort's influence with the Plains Indians and its political and social connections in Santa Fe helped pave the way for the U.S. occupation of the West and the annexation of Mexico's northern province during the U.S.-Mexican War. Along with El Camino Real, the Santa Fe Trail was part of a trade network linking Europe, New York, and St. Louis with Santa Fe and Mexico City. Opened in 1821, the Santa Fe Trail followed old trade routes established by American Indians that were later used by Spanish, Mexican and American troops, traders and other travelers.

[Keynotes, Presentations, Workshops, Papers, Posters, Demos and Exhibits!](#)

About the Immersive Education Initiative

The **Immersive Education Initiative** is a non-profit international collaboration of educational institutions, research institutes, museums, consortia and companies. The Initiative was established in 2005 with the mission to define and develop standards, best practices, technology platforms, training and education programs, and communities of support for virtual worlds, Virtual Reality, augmented and mixed reality, simulations, game-based learning and training systems, immersive teaching and immersive learning systems, and fully immersive environments such as caves and domes.

Thousands of faculty, researchers, staff and administrators are members of the Immersive Education Initiative, who together service millions of academic and corporate learners worldwide.

Chapters support the rapid and continued growth of Immersive Education throughout the world, and constitute the geographically distributed structure of the organization through which regional and local members are supported and enriched. Chapters organize officially sanctioned Summits, Days, workshops, collaborations, seminars, lectures, forums, meetings, public service events and activities, technical groups, technical work items, research, and related activities.

About Immersive Education Summits

Immersive Education (iED) Summits are official **Immersive Education Initiative** conferences organized for educators, researchers, administrators, business leaders and the general public. iED Summits consist of presentations, panel discussions, break-out sessions, demos and workshops that provide attendees with an in-depth overview of immersion and the technologies that enable immersion. iED Summits feature new and emerging virtual worlds, game-based learning and training systems, simulations, mixed/augmented reality, fully immersive environments, immersive learning and training platforms, cutting-edge research from around the world, and related tools, techniques, technologies, standards and best practices.

Speakers at iED Summits have included faculty, researchers, staff, administrators and professionals from **Boston College**, **Harvard University** (Harvard Graduate School of Education, Berkman Center for Internet and Society at Harvard Law School, and Harvard Kennedy School of Government), **Massachusetts Institute of Technology (MIT)**, MIT Media Lab, The **Smithsonian** Institution, **United Nations Educational, Scientific and Cultural Organization (UNESCO)**, Federation of American Scientists (FAS), **United States Department of Education**, National Aeronautics and Space Administration (**NASA**), **United**

States Department of the Interior (DOI) National Park Service, Temple University, Rice University, **Stanford** University, Internet 2, **Cornell** University, **Loyola Marymount University**, Southeast Kansas Education Service Center, Kauffman Foundation, **Amherst** College, Boston Library Consortium, **Walt Disney Animation Studios**, Stratasys Ltd., **Duke** University, **Oracle**, Sun Microsystems, **Turner Broadcasting**, Open Wonderland Foundation, **Gates Planetarium**, Vertex Pharmaceuticals, University of Maryland College Park, **UCLA**, USC, **Google**, Microsoft, **Intel**, Halliburton Company, **Oracle**, **Computerworld**, The MOFET Institute (Israel), **Technion Israel Institute of Technology** (Israel), **Keio** University (Japan), Chukyo TV Broadcasting Company (Japan), Nikko Telecommunications Company (Japan), **National University of Singapore**(NUS), Open University (UK), **University of Glasgow** (UK), Coventry University (UK), **University of St Andrews** (UK), Giunti Labs (Italy) and European Learning Industry Group, **University of Barcelona** (Spain), Universidad Carlos III de Madrid (Spain), University of Oulu (Finland), **Royal Institute of Technology** (Sweden), **École Nationale Supérieure des Arts Décoratifs** (EnsAD; France), Interdisciplinary Center Herzliya (Israel), Graz University of Technology (Austria), University of West of Scotland (UK), **University of Essex** (UK), Universidad Complutense de Madrid (Spain), **University of Vienna** (Austria), **Government of New South Wales** (Australia), Eötvös Loránd Tudományegyetem (Hungary), **Universidade Federal do Rio Grande do Sul** (UFRGS; Brazil), Indian Institute of Technology, Delhi (India), and many more world-class organizations.



ImmersiveEducation.org