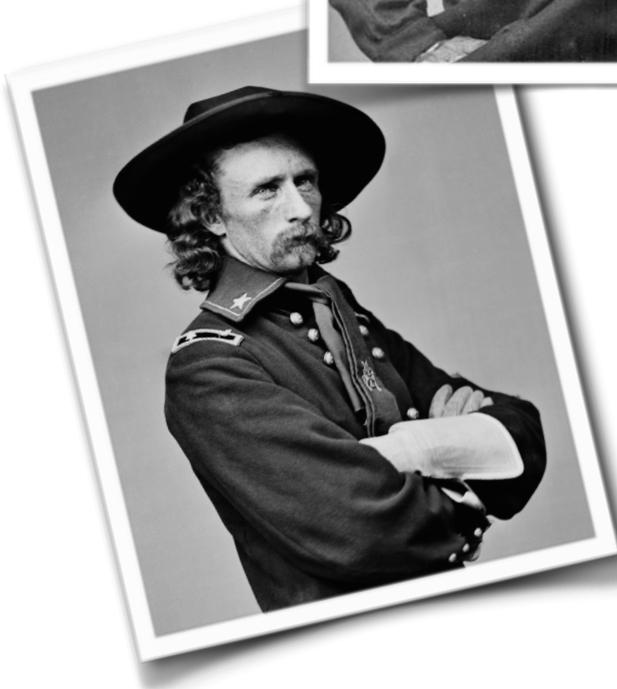
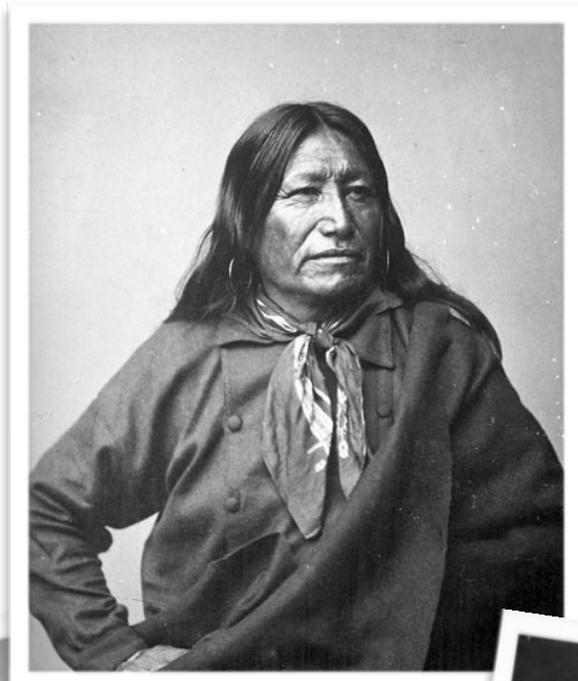
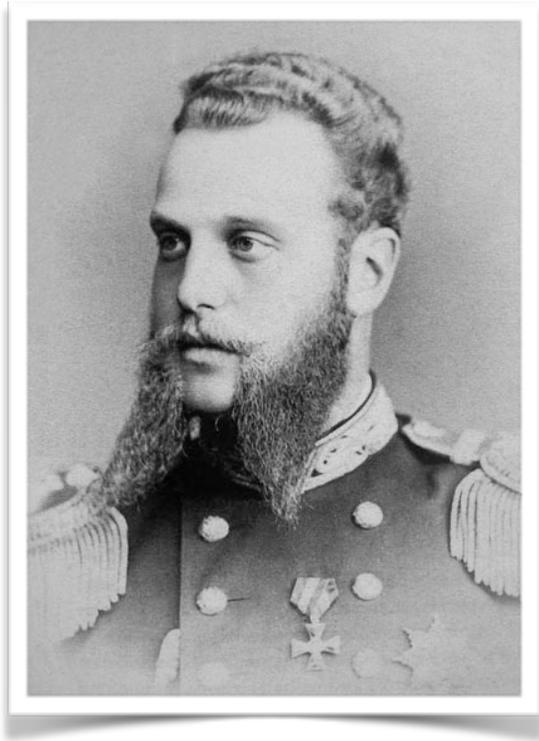


CAMP 1872

Exploring the Past and to Prepare for the Future





*If there is one underlying principle
guiding this project it is this: lessons
are best learned when lived.
The next best way is immersively.*

IN BRIEF:

CAMP 1872 is a digital “immersive”¹ technology project that proposes using the sesquicentennial of the historic “Royal Buffalo Hunt” in Nebraska the winter of 1872 to underscore the importance of resource conservation and societal cooperation in the spirit of the Iroquois people who taught we must ensure that the actions we take today do no harm to our children and their children seven generations forward².

Simply put, we propose using immersive media to virtually step back in time so we can better understand the present and prepare for the future.

The year 1872 is significant for three reasons. It was the year the US government ‘entertained’ Russian Grand Duke Alexis, the fourth son of Tsar Alexander II, and his entourage to a three day buffalo hunt in Hayes County, Nebraska, escorted by two troop

¹ Immersive media: virtual (VR), augmented (AR) and mixed reality (MR), collectively called extended reality (XR).

² <https://www.ictinc.ca/blog/seventh-generation-principle>

of US cavalry and an Army brass band. They were joined on the banks of Red Willow Creek by 600 Brulé Lakota (Sioux). It was also the year Congress authorized the creation of Yellowstone National Park, which would ultimately prove one of the last refuges for literally just a handful of bison. 1872 was also the nadir of the great southern buffalo herds: the indiscriminate mass slaughter of which peaked between 1871-73. The smaller northern herd would follow a decade later. By 1890 there were estimated to be fewer than 500 bison left on the continent.

In effect, while Americans and Russians offered their mutual toasts and sipped champagne, all around them one of the continent's greatest natural wonders was being exterminated in genocidal numbers through a lethal combination of disease and unrestrained hunting pressure for their hides, heads and sometimes only their tongues.

What makes the "Royal Buffalo Hunt" unique in American history is that it brought together two icons of Western lore: Lt. Col. George Armstrong Custer, then age 33, and Army contract scout William Frederick Cody, age 26. Commanding them was 35 year-old General Philip Sheridan, who as the head of the Army of the Frontier was responsible for the peaceful settlement of the Great Plains and relations with the nomadic tribes. The 1872 hunt may have been the high water mark of relations with Russia as well as with the tribes. In two years, Custer would lead a massive expedition into the Black Hills, setting off a gold rush that would ultimately lead to the Battle of the Greasy Grass, a.k.a. the Little Bighorn.

EXPLORING THE PAST TO PREPARE FOR THE FUTURE:

Volumes have been written about the lives of historic figures like Cody and Custer. Numerous documentaries have been shot and theatrical films produced about their lives. Modern day enactors like Steve Alexander and Kirk Shapland share their personal reflections of Custer and Cody respectively and the period in which they lived. But each approach has its shortcomings. Film, video and even print are essentially one-way channels of information, while enactors are temporally limited by time and place.

What if we could meld this literary treasure trove with the interactive capabilities of enactors who, through the "magic" of CGI, could be transformed into 3D verisimilitudes of the real person, at least as much as historical depictions, photographs in particular, might allow. These are called *immersive agents*. Such 'agents,' directed by deep learning algorithms, not only can appear to address an audience of many³ but soon

³ https://www.ted.com/talks/doug_roble_digital_humans_that_look_just_like_us

interact, in real time, with an audience of one, carrying on a conversation, asking and answering questions, offering insights into their personality⁴. Because of the emerging nature of the technology it is recommended that we stage development of what these immersive agents as follows:

Stage 1: Immersive agent tells stories

Stage 2: Immersive agent converses

Stage 3: Immersive agent interacts via *procedural content generation*⁵

It is sometimes the tiniest fleck of gold in a miner's pan that leads to the discovery of a mineral bonanza. So it is with the CAMP 1872 project: the chance reference to an obscure event 150 years ago that set off the author in pursuit of the larger story, one that has led to digging ever-deeper into the quartz vein "ledges" of history, to use the parlance of Samuel Clemens from his "Roughing It" days⁶. How could an estimated 30-50 million wild bison roaming the North American midsection, from the frigid Canadian tundra to the arid deserts of northern Mexico, come within a hairs breath of extinction in a single lifetime? What role did commercial 'hide hunters,' wealthy sportsman, hungry railroad workers, Oregon Trail emigrants, Texas cattle drovers, desperate Cheyenne, Lakota, Arapaho, Pawnee, and other native tribes, the United States Army, and the government itself play in this mass extermination?

More importantly, what can we learn from it, especially now that it's not herds of shaggy bison that are imperil, but the human race that finds itself living beyond the means of the planet?⁷ Does a short three-day hunting party — its participants not entirely oblivious to the consequences of their actions - a century and a half ago have anything to tell us today? Can bringing the camp and its denizens virtually "to life" help us appreciate not just that period of time, but also better understand ours and where our action — or inaction — may lead us?

We likely may never see the advent of a "time machine" that can transport us back in time, even a few seconds much less centuries. Such a contraption is likely impossible. But emerging digital technologies, collectively called "Extended Reality" (XR) - a

⁴ https://youtu.be/PqbB07n_uQ4

⁵ "Procedural content generation is often used to refer to the algorithmic creation of game content with limited or indirect user input."

⁶ <https://www.gutenberg.org/files/3177/3177-h/3177-h.htm>

⁷ <https://www.wri.org/publication/millennium-ecosystem-assessment-living-beyond-our-means>

integration of so-called Virtual Reality (VR) and Augmented Reality (AR) - can offer a reasonably satisfying alternative. Virtual Reality immerses the headset wearer in a digitally fabricated landscape of sight and sound, while Augmented Reality superimposes digital artifacts over the real world through smartphone apps and emerging eyewear⁸.

Each approach has its advantages. Given its sensory isolating strategy, especially in terms of the visual sense, VR can offer a deeper immersive experience. Wider “worlds” can be explored within physically constrained space.

Conversely, AR can make use of large physical space; in fact, the entire planet can be its playground as witnessed by the Pokémon phenomenon. AR offers the advantage of keeping the wearer in the “present.” Its purpose is to “enhance” the visual experience rather than distract.

Both VR and AR experiences are subject to limits in processor speed, data storage capacity, projection acuity, and artistic esthetics. The hardware required for both systems are expensive but coming down in price, though both can be accessed via free or low-cost Apps displayable on most modern smartphones. In terms of connectivity, initially we envision all of the digital assets being supplied via device memory. However, as multi-megabyte wireless connectivity becomes evermore widely available, advanced features such as *procedural content generation* can be utilized, significantly enhancing the life like responsiveness of the agents, in particular.

PROJECT SCOPE

CAMP 1872 is a three phased project in terms of XR technology development.

These are:

Phase One: Creation of a 3D CGI version of the 1872 hunting camp. Called Camp Alexis by the troops, it was comprised of two major sections: the U.S. Army-assembled tent camp and bivouac, and the Brulé Lakota tipi camp. The general location and organization of the U.S. Army camp was identified by a 2008-2009 University of Nebraska Department of Anthropology survey of the site, the finding of which are published in *Custer, Cody, and Grand Duke Alexis*:

⁸ See Appendix 5

*Historical Archaeology of the Royal Buffalo Hunt*⁹. While the exact position and number of all the tents, both Army and Brulé is unknown, several of the large officer tents and that of Chief Spotted Tail are known. Other historical photos of similar Army bivouacs¹⁰ and native villages can provide a general guide to their relative locations.

Additionally, it is known that the Army typically deployed a large number of freight wagons and ambulances, pulled by multiple teams of horses and mules. Similarly, native Plains tribes also moved with large herds of horses with each family often having several in their possession. Historic accounts indicate that Spotted Tail (Sinte Gleska) is reported to have moved some 600 members of his tribe up from Kansas to rendezvous with the hunting party on the promise of receiving their allotment of government annuities: flour, coffee, sugar, etc. The U.S. Army provided an escort of two troop of Cavalry (approximately 100 men) and an Army brass band from Fort McPherson. This camp would initially be rendered as *low-poly* for beta testing purposes. It would be scaled up in resolution as technology allows and demand dictates. It would be ported as both VR and AR, the latter displayable at life-sized scale with individual structures, such as the officer's mess tent, Alexis' tent, and Spotted Tail's tipi, scalable for virtual inspection of their interiors. This would allow visitors to museums, schools, libraries to use smartphones to display and explore a full-size rendering of the tent or tipi in a limited indoor space. A "table top" scaled version of the camp would be viewable in AR. VR version for 3D headsets would make it possible to explore the entire camp site without moving.

Time Frame: Within 6 months of initial project funding

Phase Two: The digital quality of the camp is improved, moving close to a full version release with target launch on sesquicentennial of the hunt in January 2022. The AR version of the camp is also programmed to be triggered by GPS latitude and longitude coordinates (and Bluetooth beacons, if necessary) allowing the virtual reconstruction of the 1872 camp on the original site¹¹ along Red Willow Creek in Hayes County, Nebraska. In effect, visitors to the site, which is private property at this writing, would see a full scale, digital facsimile of the two camps

⁹ Douglas Scott, Peter Bleed and Stephen Damm (University of Oklahoma Press, 2013)

¹⁰ See Appendix 2: Historic Reference Images

¹¹ 40.564236, -100.908603

either via the smartphone App or via AR glasses emerging on the market, giving a much more realistic presentation of the camp, in situ. Additionally, animated people would now begin to inhabit the camp: cavalry soldiers, Grand Duke Alexis entourage, Lakota tribes people. Five key characters would be introduced: Grand Duke Alexis, Cody, Custer, Sheridan, and Spotted Tail. They would be animated¹², but not verbally interactive. Contextual information either in the form of text, audio or a combination of both utilized. This version, after thorough testing, including at the Red Willow Creek location, would be released to the public: the initial target audience being schools, museums in Nebraska, Wyoming, Kansas, Colorado, Dakota, Departments of Tourism, conventions. We would hope to partner with one or more of the following XR technology leaders: NReal, Microsoft, Vuzix, Vuforia, Wikitude.

Time Frame: Ready for public preview in January 2022

Phase Three: While other historic and long-vanished locations from the period would be added, including Fort McPherson, the principal focus will be on integrating interactive functionality into the five lead characters. This involves melding their 3D avatars with deep learning machine algorithms to give them the ability to respond to queries with answers based extent literally archives, including autobiographies, biographies, personal papers, news and magazine accounts of the day, etc. The avatars would be able to react visually and verbally to human queries in near or realtime. These avatars could be displayable individually or in groups, anywhere high-bandwidth connectivity allows¹³ .

Time Frame: As technology, in particular A.I. integration, and funding allows, hopefully with 24 months of initial funding.

¹² It is estimated that the process of “motion capture” may require some 40 hours of each actor’s time in a volumetric capture studio. See link on footnote 3.

¹³ “StarLink vs. 5G” <https://medium.com/@ankushborkar/starlink-vs-5g-f69b1dcdd8ab>

PROPOSED PROGRAM:

The ability to both internalize and externalize digital media in XR allows for the CAMP 1872 project to be experienced in some of the following ways.

Exhibition “Road Show” — Imagine a museum gallery in which are mounted vintage life-sized photographs of the key principals¹⁴, photos taken either in Omaha or in St. Louis just prior to or after the hunt: Cody, Custer, the Grand Duke, in group and individual portraits. Similarly, Spotted Tail and General Sheridan would appear life-sized in front of their portraits. Through a pair of rented AR glasses, 3D avatars of these individuals form in front of the photo and appear to interact with each other in version 1.0. By Version 3.0 or so, they would interact with the audience through Deep Learning algorithms.

Red Willow Creek Encampment — The site of the 1872 encampment is on private property, but has been used for community gatherings, including picnics and pickup baseball games in the 1930s. Assuming controlled access to the site can be arranged with the property owners, an AR app downloaded to smart phones or upcoming “smart glasses” could be used to explore the site, including recovering digital facsimiles of those uncovered in the 2008-2009 archaeological survey, as well as “salted” digital artifacts such as iron arrow heads, bison skulls, spent .50 and .44 caliber metal cartridges, etc. Here the focus would be on interacting with the equipment: tents, tipis, livestock, wagons, etc.

DEVELOPMENT TEAM:

As of this writing (2 Dec. 2020) the project has attracted the interest and support of the following individuals in advisory capacities:

Lead Project Co-ordinator

J. William “Bill” Moore - Founder, Editor in Chief EVWorld.Com, event coordinator for AirMail100 Centennial Flights project.

¹⁴ See Appendix 1 : PHOTOGRAPHY STUDIO IMAGES

History Consultants

Douglas D. Scott - Retired National Park Service archaeologist and co-author of *Custer, Cody, and Grand Duke Alexis: Historical Archaeology of the Royal Buffalo Hunt*

Peter Bleed - Professor Emeritus, University of Nebraska Lincoln and co-author of *Custer, Cody, and Grand Duke Alexis: Historical Archaeology of the Royal Buffalo Hunt*

Lee Farrow - Professor and Distinguished Teacher of Russian History, Auburn University, Author of *Alexis in America: A Russian Grand Duke's Tour, 1871-1872*

Michael & Kathleen Gear - New York Times Best Seller authors, who together and separately have published 70 novels and over 200 non-fiction articles in the fields of history, archaeology, and writing.

Efforts are ongoing to similarly enlist the advice of Lakota tribal representatives in South Dakota, as well as other Native People professionals in Nebraska.

Digital Consultants

Joshua Fisher - Assistant Professor of Immersive Media at Columbia College Chicago

John Canning - Executive Producer - New Media & Experiential at Digital Domain, Los Angeles.

Developers to be Recruited

Writer(s)

Character Enactors

Motion Capture

3D Modeling Sculpting, Rigging, Texture Baking, Animation

Programming AR/VR/XR, C#, Java

Machine interface with Deep Learning A.I. (e.g. Google GPT-3)

Wireless Network Communications

As indicated in Appendix 3, much of the 3D model development aspect of the project can be acquired using freelancers available online, as well as utilization of immersive media students at Columbia University¹⁵. It is also an *aspiration* of the project to use it as the catalyst to develop local talent, especially among both indigenous and under-served communities, including RISE¹⁶ program participants and within the Great Plains reservation community, with training and coordination available online.

AUDIENCE ENGAGEMENT

The XR-aspects (AR and VR) of the project are aimed primarily at young adults (ages 12-18) and adults in either group or individual remote learning situations. The growth of remote working, training, education, and entertainment - due in large measure to COVID-19 - means that the need for engaging, stimulating, thought-provoking programming will only multiply. CAMP 1872 can be the vehicle that paves the way to the merger of XR and AI, while raises awareness of the environmental challenges confronting this and future generations.

As time and resources allow, a third aspect of the project we wish to pursue is a mobile game tentatively called *Little Big Buffalo Hunt*¹⁷ patterned somewhat after Niantic's *Pokémon GO* and tailored to pre-teens. Its goal is to find and capture alive scattered digital bison - young and old - and grow them into a viable wild herd that can be exchanged for virtual money with which to acquire more digital land on which they can roam free and become genetically stronger. We see this as an important way to engage youth and reinforce the lessons of resource conservation and the importance of preserving the "wild" in our world¹⁸.

¹⁵ UNL's Johnny Carson Center for Emerging Media Arts would certainly be encouraged to participate as well. <https://arts.unl.edu/carson-center>

¹⁶ <https://www.seeusrise.org/>

¹⁷ http://camp1872.toonstech.com/camp1872/Little_Big_Buffalo_Hunt.pdf

¹⁸ *American Plains Bison: Rewilding an Icon* by James Bailey (2013) and *Re-Bisoning the West: Restoring an American Icon to the Landscape* by Kurt Repanshek

FUNDING & BUDGET

The scale and scope of the project is ambitious and groundbreaking. How much of it can be accomplished within the time frame of just over 13 months is largely dependent on the level and timing of funding available. When asked how much a project of this scale might cost, John Canning, an executive producer at Los Angeles-based Digital Domain, and one of the project's digital technology advisors, speculated it could run \$100,000 or \$1 million. A very basic, *non-interactive* XR version of the hunting camp could be done for under \$25,000 our other digital technology advisor, Joshua Fisher thought.

Revenue Streams

The proposal envisions several possible revenue streams. See Appendix 4 for projected revenues from VR gaming 2017-2024

Exhibition Fees - revenue derives for traveling exhibits at museums, conventions, educational institutions. These would include fees paid by the exhibitor, as well as rentals of AR hardware.

In-App Sponsorship - sponsor(s) would underwrite exhibition costs.

Game App Monetization - fees and micro-payments from engagement with the "Little Big Buffalo Hunt" mobile game similar to Pokémon Go revenue generation,¹⁹

BEYOND RED WILLOW CREEK

Interest in the Royal Buffalo Hunt and the characters associated with it is perennial, certainly in large part because of the tragic outcome of the Battle of the Little Big Horn and the international showmanship of an ex-Army scout and hunter by the name of Cody. Custer died before he was forty and "Buffalo Bill"

¹⁹ Pokémon GO's revenue reached **\$1 billion** in the first ten months of 2020 alone, making the game's lifetime revenue cross \$4 billion/

died at 81, yet their exploits are deeply etched into the collective consciousness of generations since and will likely live well beyond this century.

2026, just over five years from now, will mark the 150th anniversary of the fatal fight on the Greasy Grass. Certainly it too will be commemorated. The technology perfected for **CAMP 1872** can be applied to that event should the National Park Service pursue it. The Lakota and Cheyenne villages can be digitally erected, the killing ground recalled. In fact, the opportunities to deploy the technology are myriad, from tracking the animals of the Pleistocene to exploring America's lost airmail landing fields.²⁰

It should also be recognized that the melding of AR and AI may open up a Pandora's box, but one that will, inevitably, present itself. CAMP 1872 can become the testbed on which the boundaries can be identified and established.

The lessons best learned are those that are lived. The next best is immersively.

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APPENDIX 1 : PHOTOGRAPHY STUDIO IMAGES



Photo of Custer (left), Alexis, and Cody, taken at the time of the hunt, possibly in Omaha.

APPENDIX 2 - HISTORIC REFERENCE IMAGES



Civil War Union Army Ambulances



Custer's 1874 expedition into contested Black Hills



Union Army encampment with Sibley (conical) tents, standard wall tents and "A" tents.



Note that from a distance Sibley tents were confused with Plains Indian tipis.

APPENDIX 3 - DIGITAL REFERENCE IMAGES



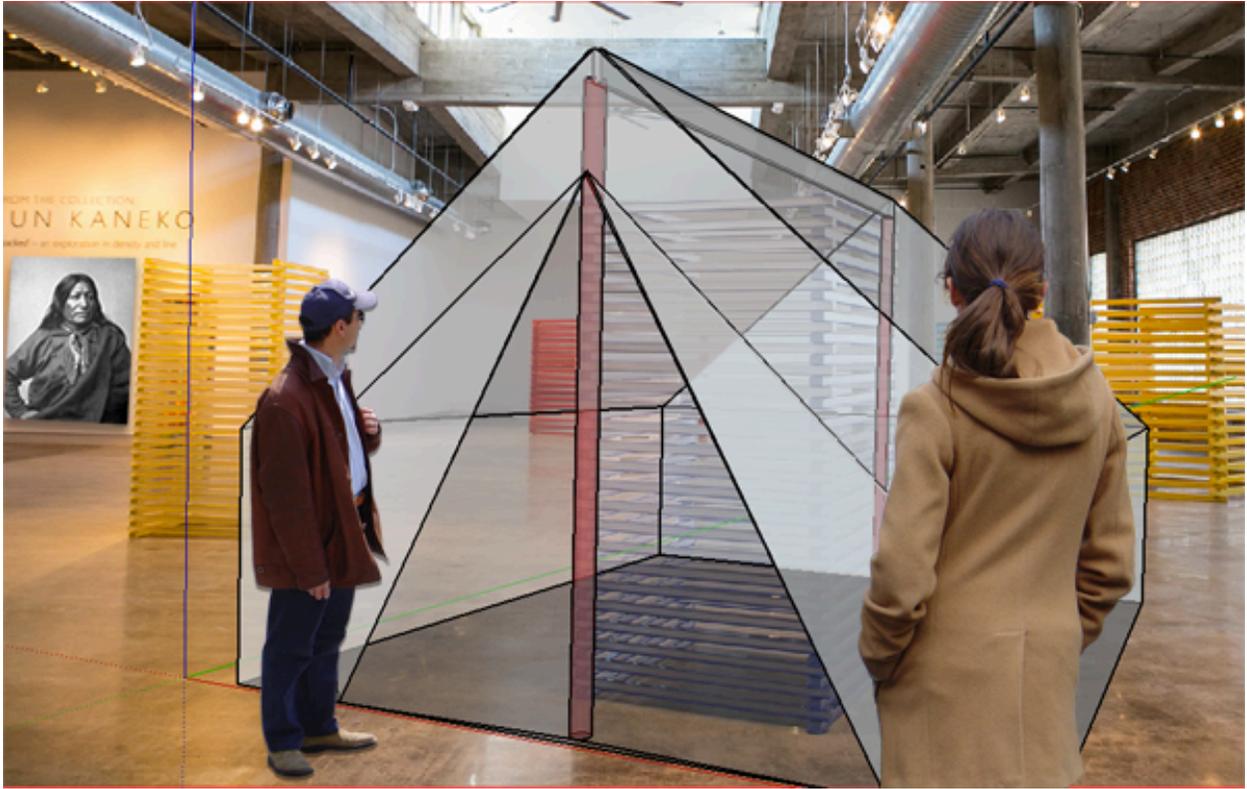
3D digital sculpture of Sitting Bull

BELOW: Augmented Reality 3D gray wolves in Walnut Creek Rec. Area



BELOW: "Rigged" 3D bison calf available online for less than \$200



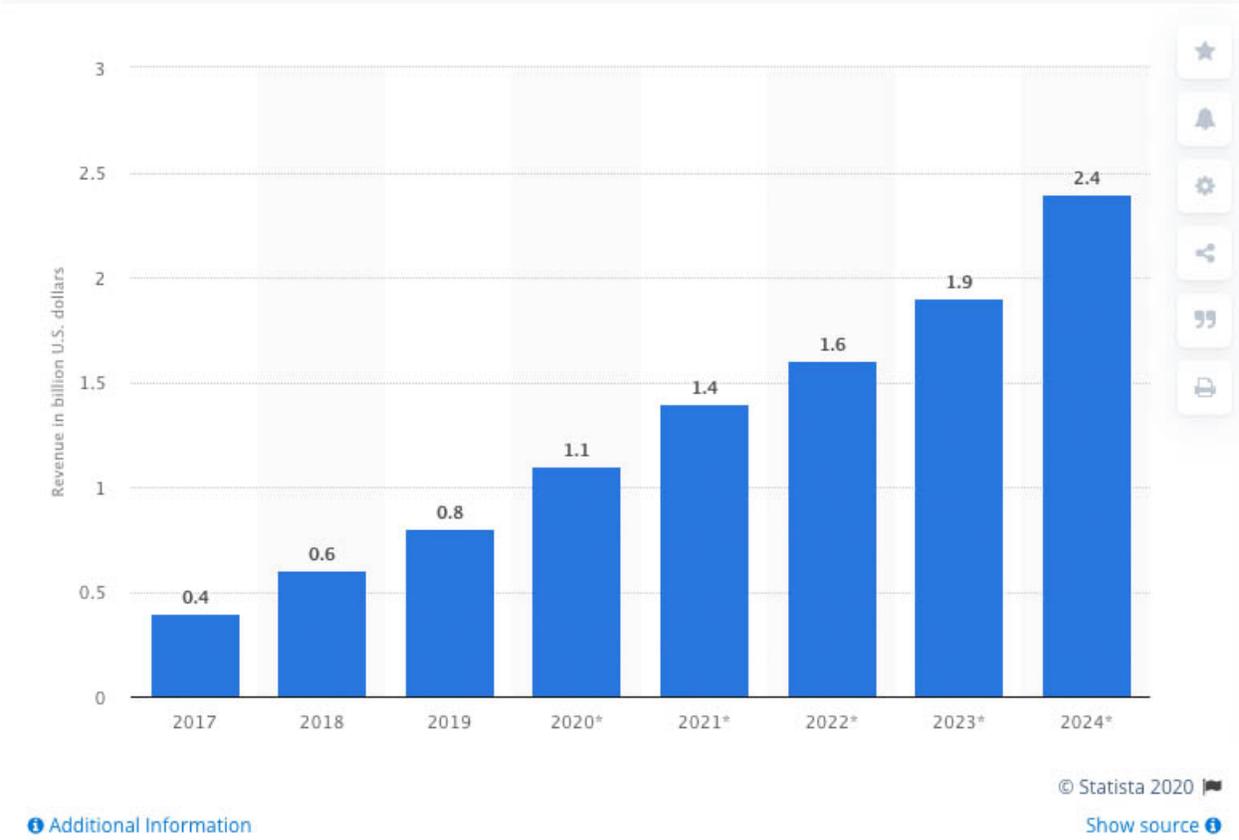


BELOW: 3D model of Civil War hospital tent superimposed in Kaneko (Omaha, NE) exhibit space

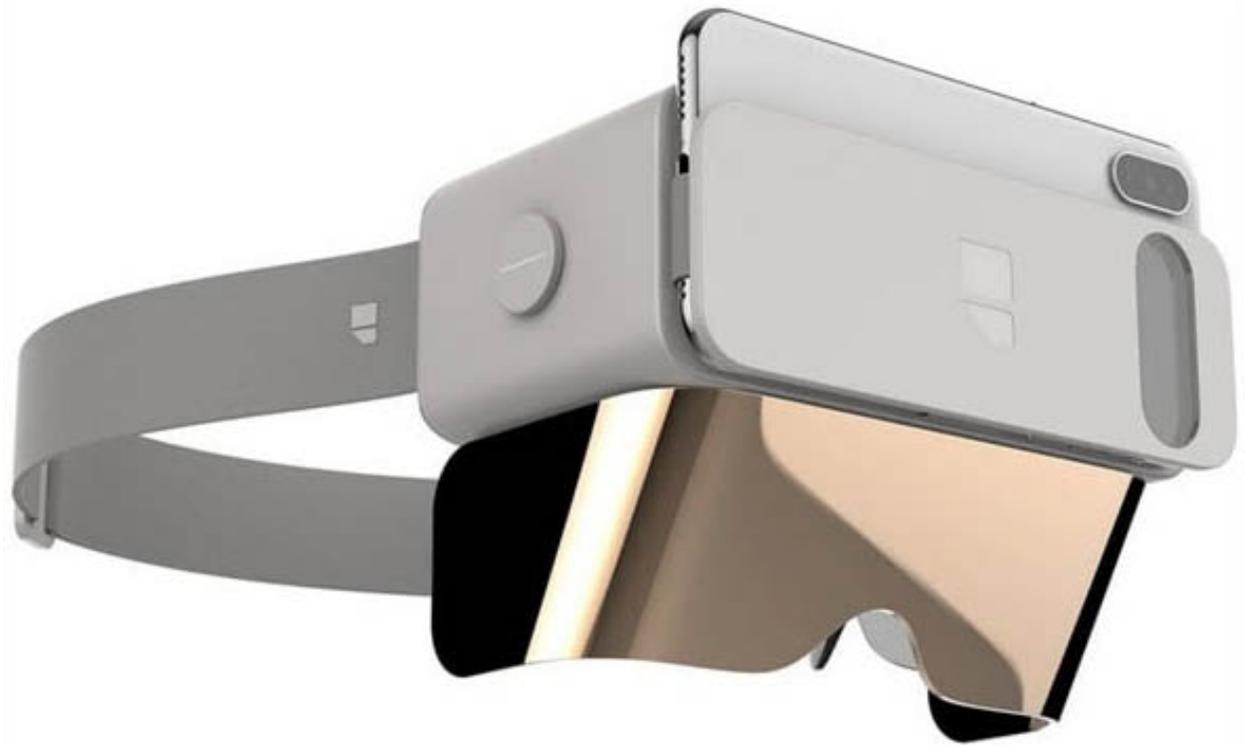
APPENDIX 4 - REVENUE

Virtual Reality (VR) Gaming Revenue Worldwide from 2017-2024

(Billions U.S. Dollars)



APPENDIX 5 - AR GLASSES



Ghost AR Smartphone Headset