NC STATE UNIVERSITY

How Libraries Can Help Leverage VR Technology For University Faculty

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Oculus Education Partners with Research Institutions to Explore VR's Impact on Learning Outcomes

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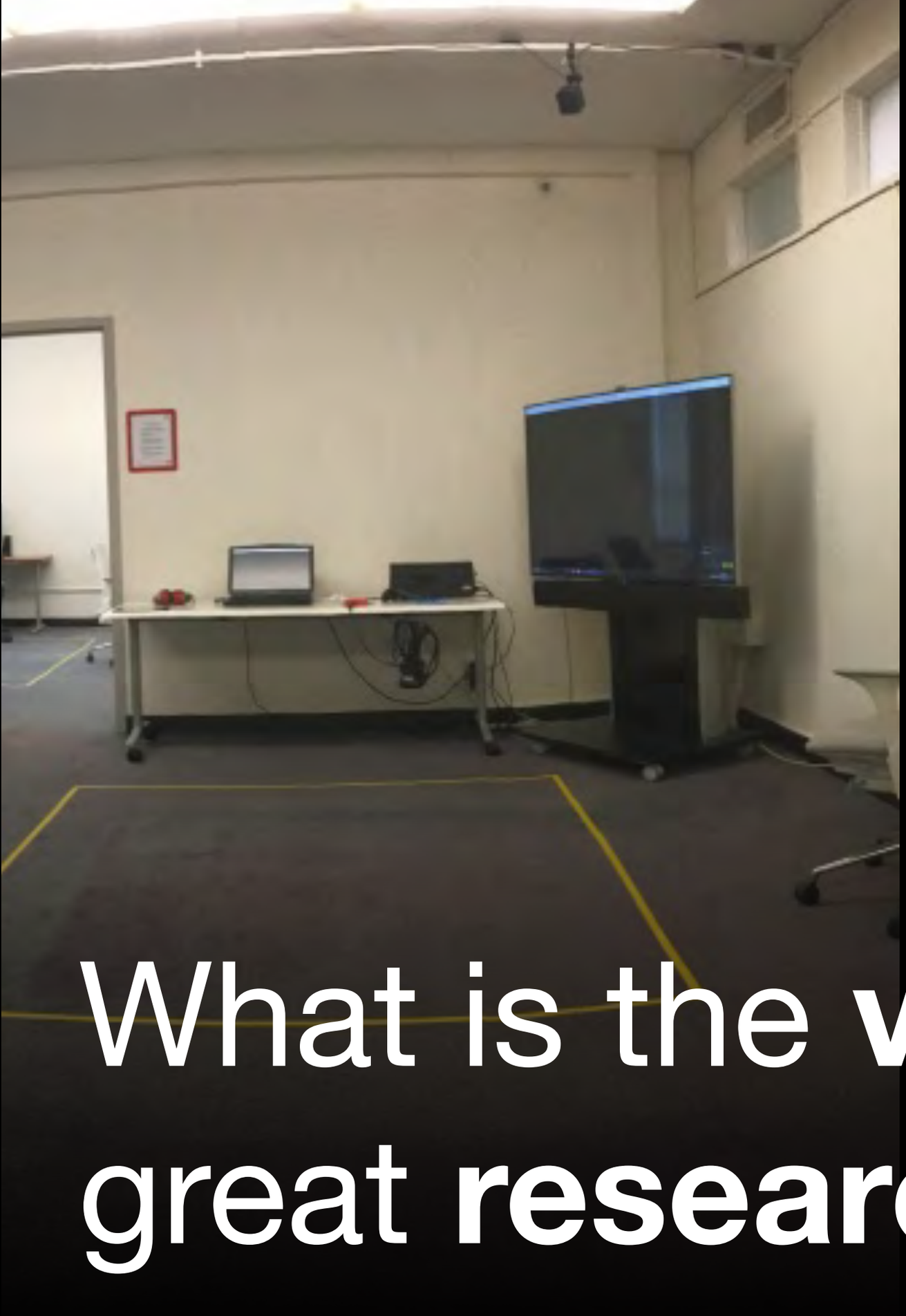
Knowledge Is Power

The mission of Oculus Education is to empower communities through VR's ability to positively impact learning and to support equitable access for all. To accomplish that goal, we need to understand how VR can have the greatest impact on learning outcomes across a variety of scenarios. Beyond our efforts to dig into existing research around VR and learning, the Oculus Education team sponsors new research to help us pinpoint and maximize VR's educational potential across pedagogy, academia, secondary and university-level education, professional training, life-long learning, and collaboration across disciplines.



What is the **value** of a great **research facility**?

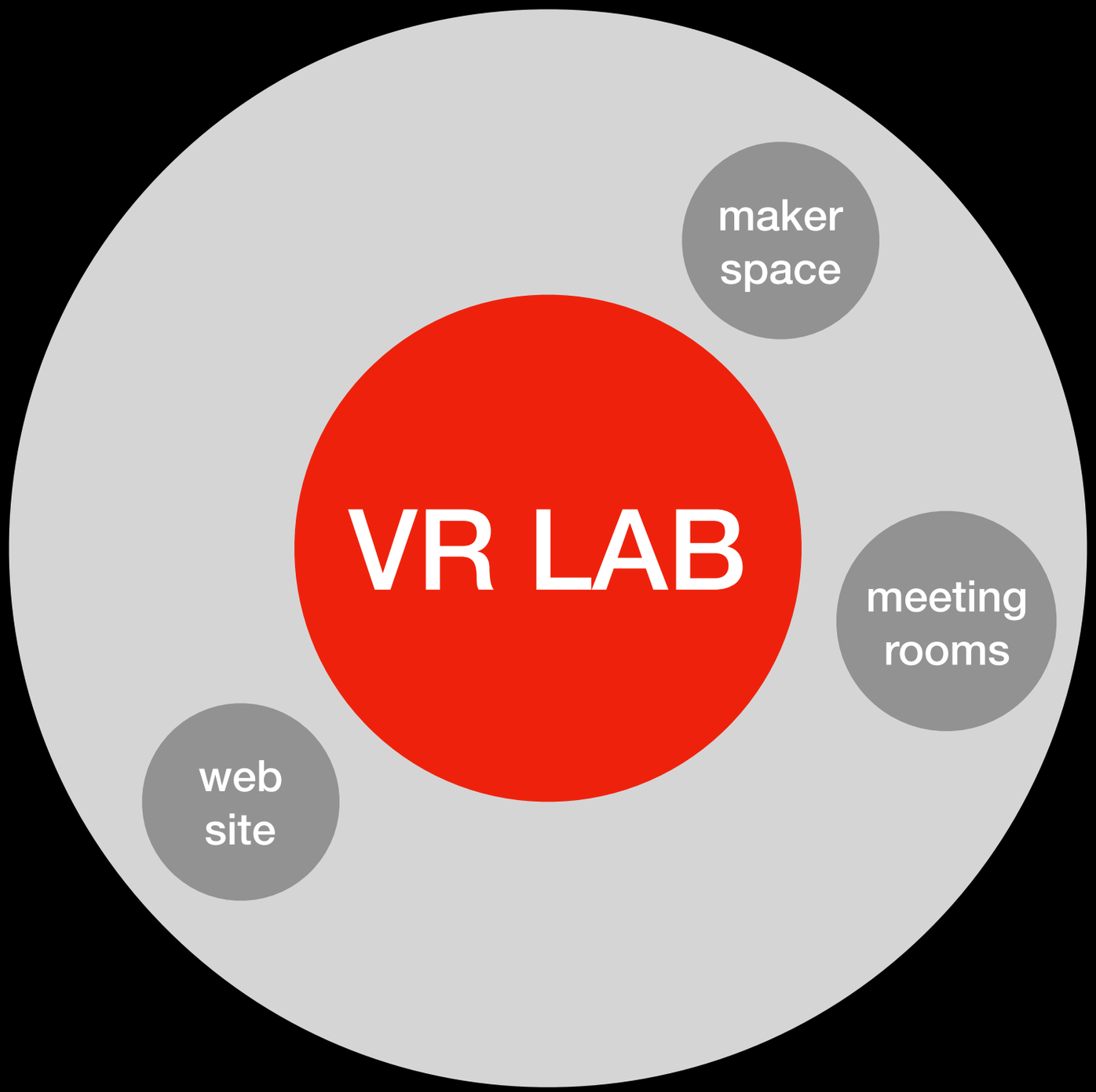
Tenure Track faculty are **evaluated** on **three major categories**

RESEARCH + TEACHING + SERVICE

The integration of immersive technology into teaching curriculum can be very challenging. While VR has several low-tech entry points, a larger footprint is need for more immersive and high-end experiences. This “footprint” encompasses more than spatial concerns, but includes technicians, hardware, and program experts to serve as liaisons into virtual worlds. This talk will discuss the library as an essential hub for university faculty to facilitate the testing of VR user experiences, facilitating VR classroom scale experiences, and connecting universities with industry partners.

Lifelong Kindergarten Group, MIT Media Lab

RESEARCH + TEACHING + SERVICE

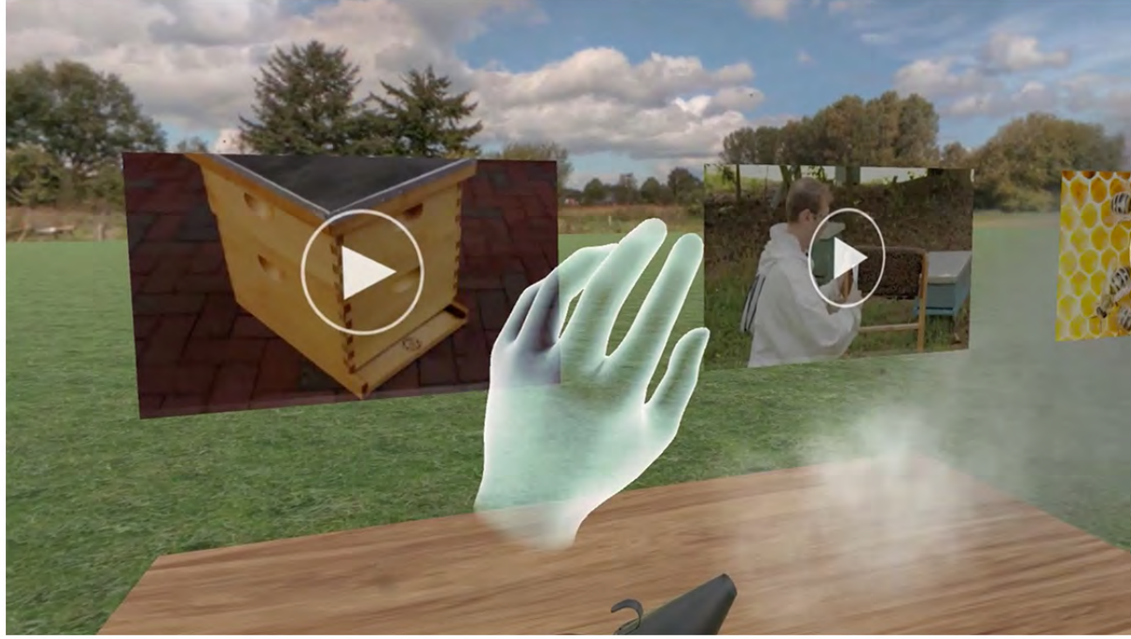


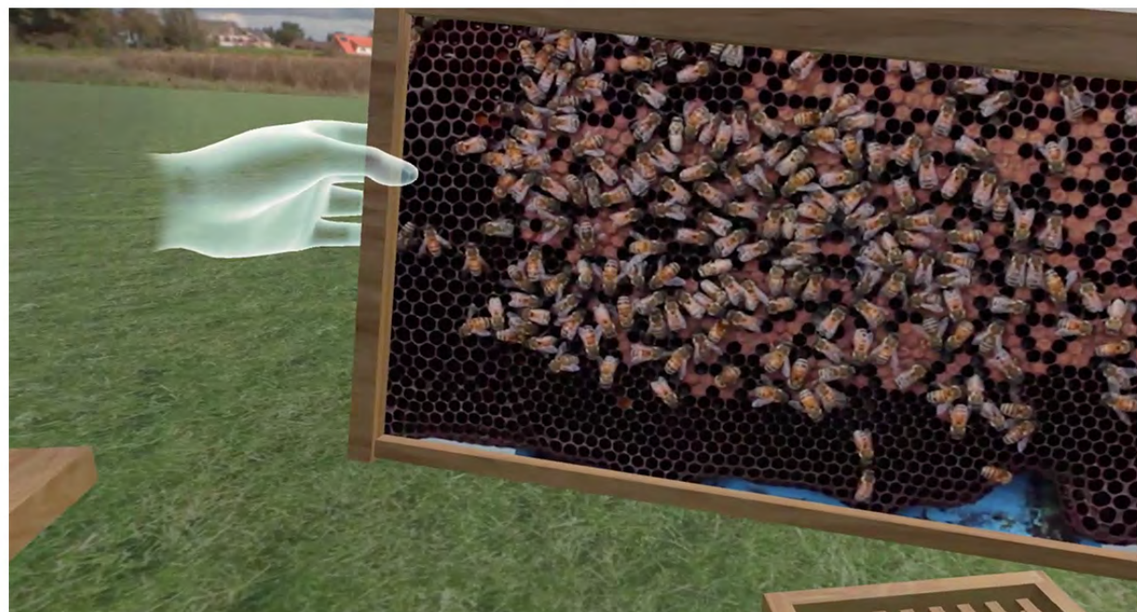
Meeting with local beekeepers through CALS Faculty at Hunt Library. Sponsored by the Big Ideas Innovation Grant (PI Dr. David Tarpy, CoPI Dr. Derek Ham)

VR Apiary

VR Design & Entomology

Current practices in apiculture education—both locally in North Carolina and worldwide—are based on traditions that date back well over a century. Equally alarming, we find a remarkable age gap in the apiculture community between practicing apiculturists and the next generation of beekeepers. As part of our investigation, we will determine what role emerging technology could play in sustaining an aging profession, efficacy of training, and dissemination of emerging issues in the industry. As such, we will be integrating research, teaching, and Extension through VR apicultural training. This project is a collaboration between two NC State Colleges—the College of Agriculture and Life Science (CALS) and the College of Design (COD)—as well as several other important internal and external partners.





“The benefits of **location-based (VR) experiences** are clear. The cost of premium headsets and gaming systems prohibit most U.S. households from getting the gear in their hands and until those costs come down, out-of-home experiences provide the best way to get consumers comfortable with the technology.”

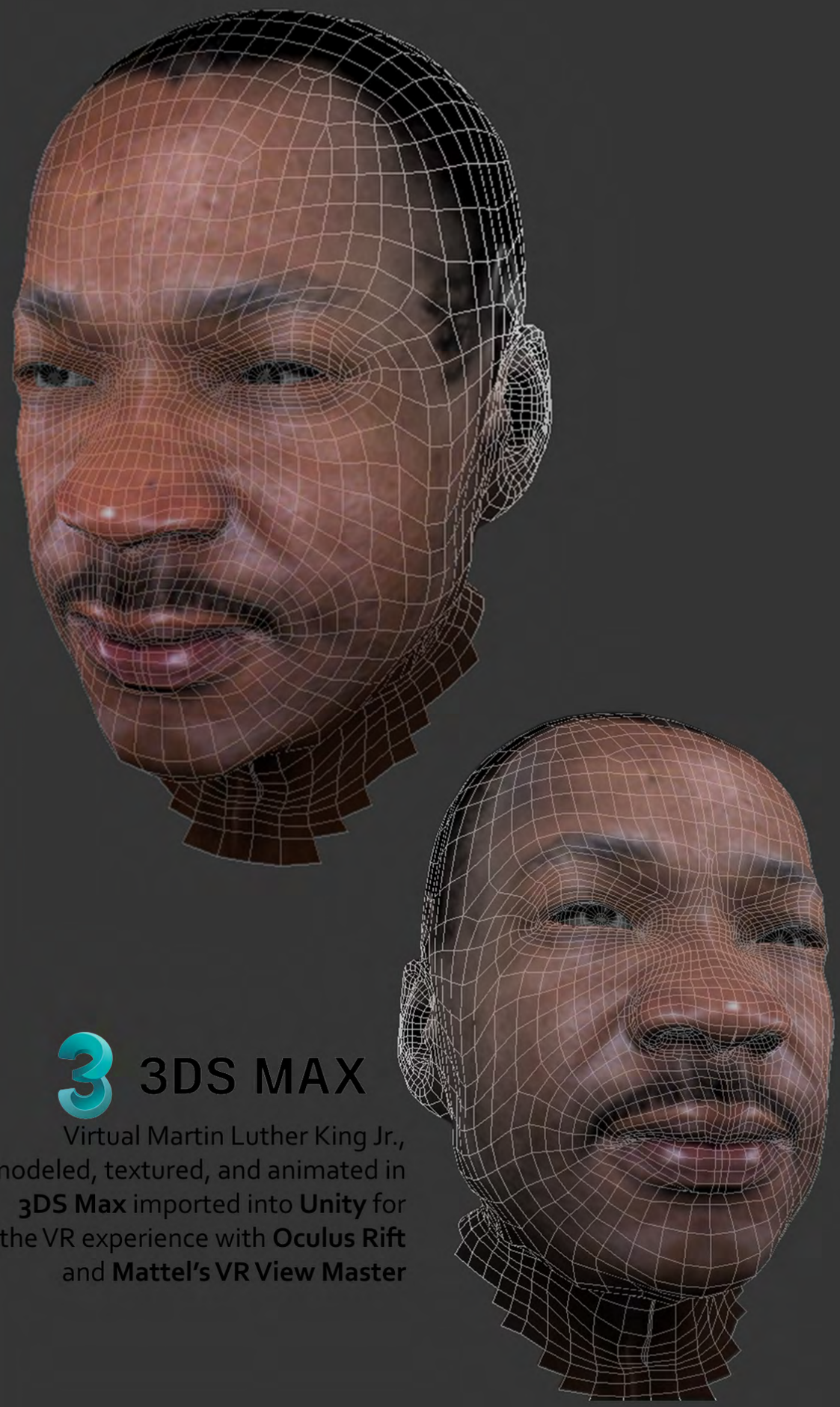
Tech Crunch

Hunt Library – “Experiencing King Exhibit”

VR MLK

VR Design & Humanities

At NC State, I have been able to work with VR through collaboration with the College of Humanities Arts and Sciences. Together, we were able to create the "Experiencing King" installation at the Hunt Library, a project that used VR to reenact a historic 1960 speech given by Martin Luther King Jr. at the White Rock Church in Durham, NC. The project involved a complete recreation of the Church from historical drawings and photographs, the rerecording of the speech from Dr. King from a voice actor, and the computer modeling and animation of Dr. King with computer modeling and animation software. The project was exhibited in Washington DC at the Smithsonian Museum of American History for the ACC Creativity & Innovation Festival.



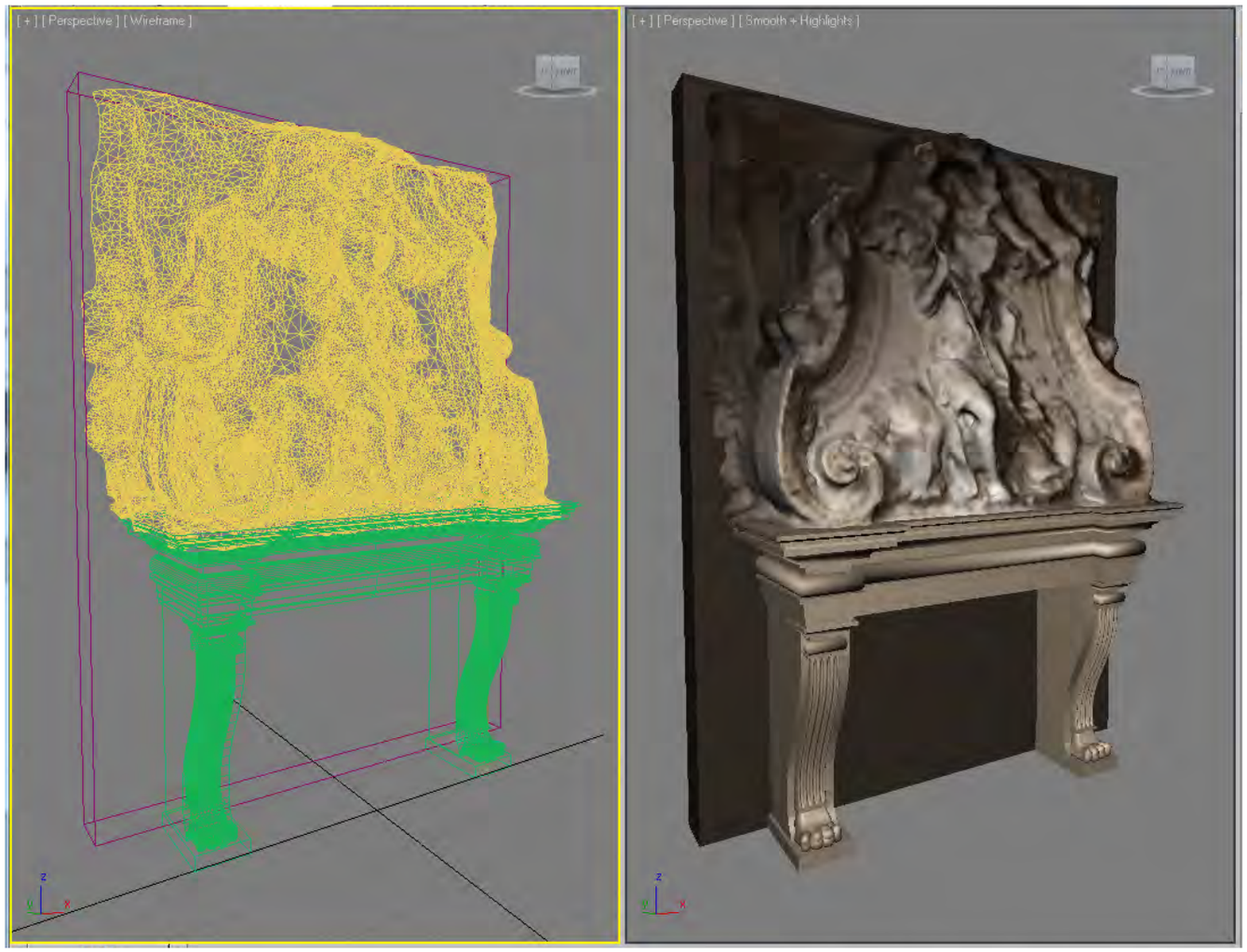
3DS MAX

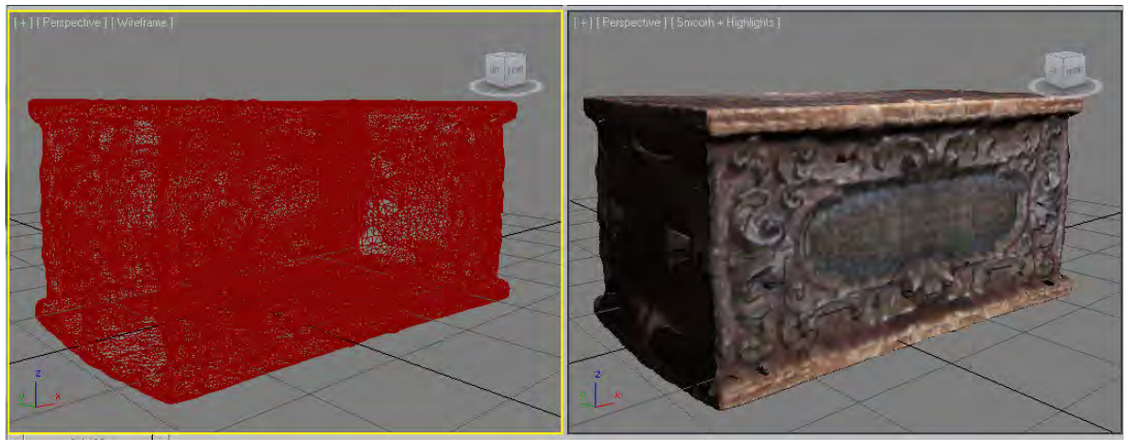
Virtual Martin Luther King Jr., modeled, textured, and animated in **3DS Max** imported into **Unity** for the VR experience with **Oculus Rift** and **Mattel's VR View Master**

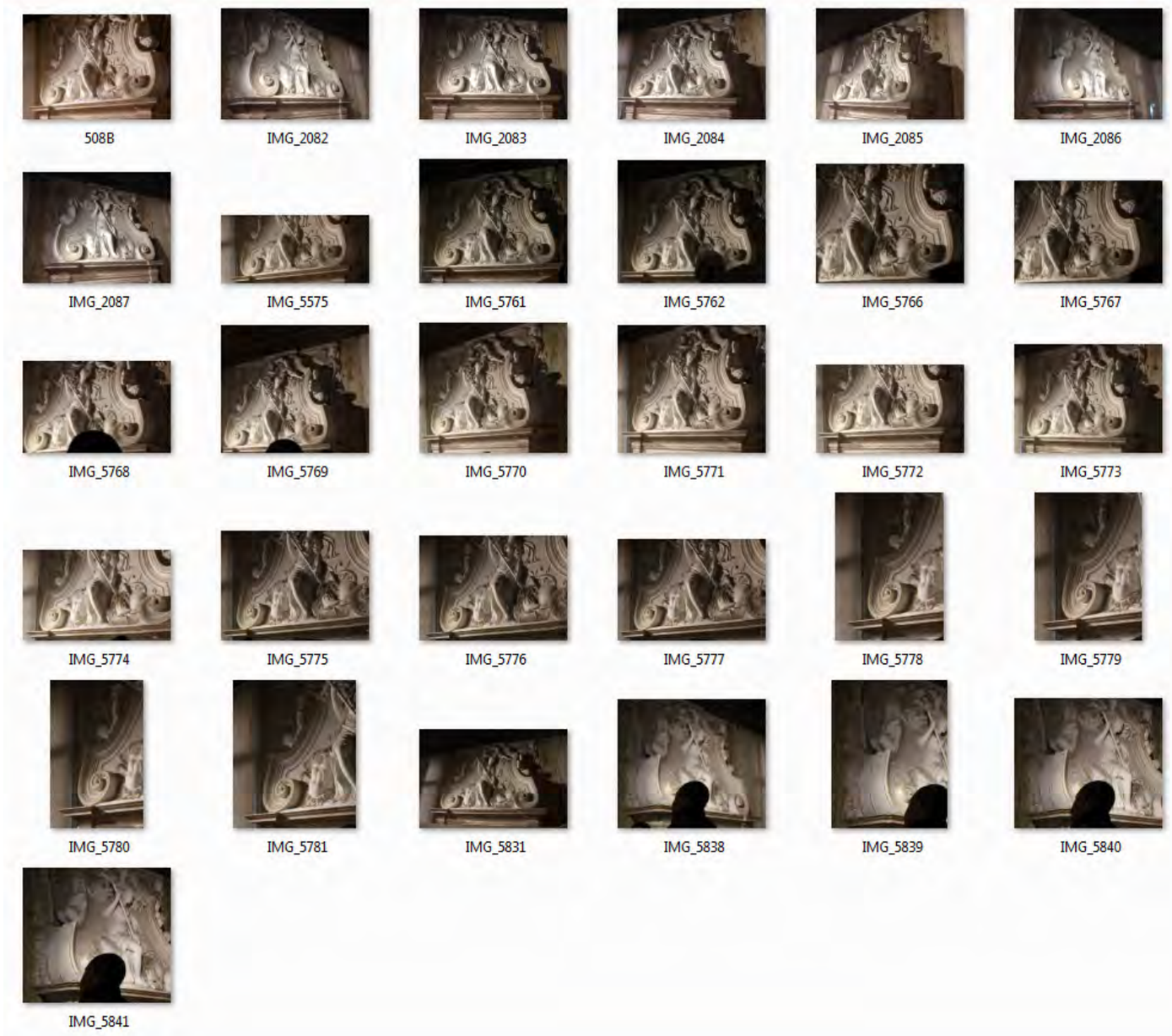
“The modern library might serve as a venue in which digital, non-traditional scholarship might be published, published about, or otherwise shared in scholarly and professional settings. Together these venues might be seen as pushing the boundaries of scholarly publishing.”

Modeling Process

Autodesk® 3ds Max®







"The future of VR (and immersive technologies) for Libraries comes in the way **VR can facilitate the archiving, management, and access digital content that takes on three-dimensional form."**

Alumni visit the VR Lab Space and here about “I AM A Man” VR Experience.

I Am A Man VR

National Civil Rights Museum | Memphis, TN

"I Am A Man" is an interactive virtual reality experience set to the historic events of the Civil Rights. It is best described as an animated short where you are able to experience virtual reality but also interact with objects in each scene for a truly immersive historical experience. The mechanics of the experience utilizes the touch controllers to allow the user to relive the events of the 1968 Memphis Sanitation Strike leading up to the assassination of Dr. Martin Luther King Jr. This interactive experience is approximately twelve minutes long.

The VR project will be on exhibit in April of 2018 at the National Civil Rights Museum in Memphis TN to commemorate the 50th anniversary of the Sanitation Worker's Strike and the Assassination of Dr. Martin Luther King Jr.

National Civil Rights Museum™
AT THE LORRAINE MOTEL

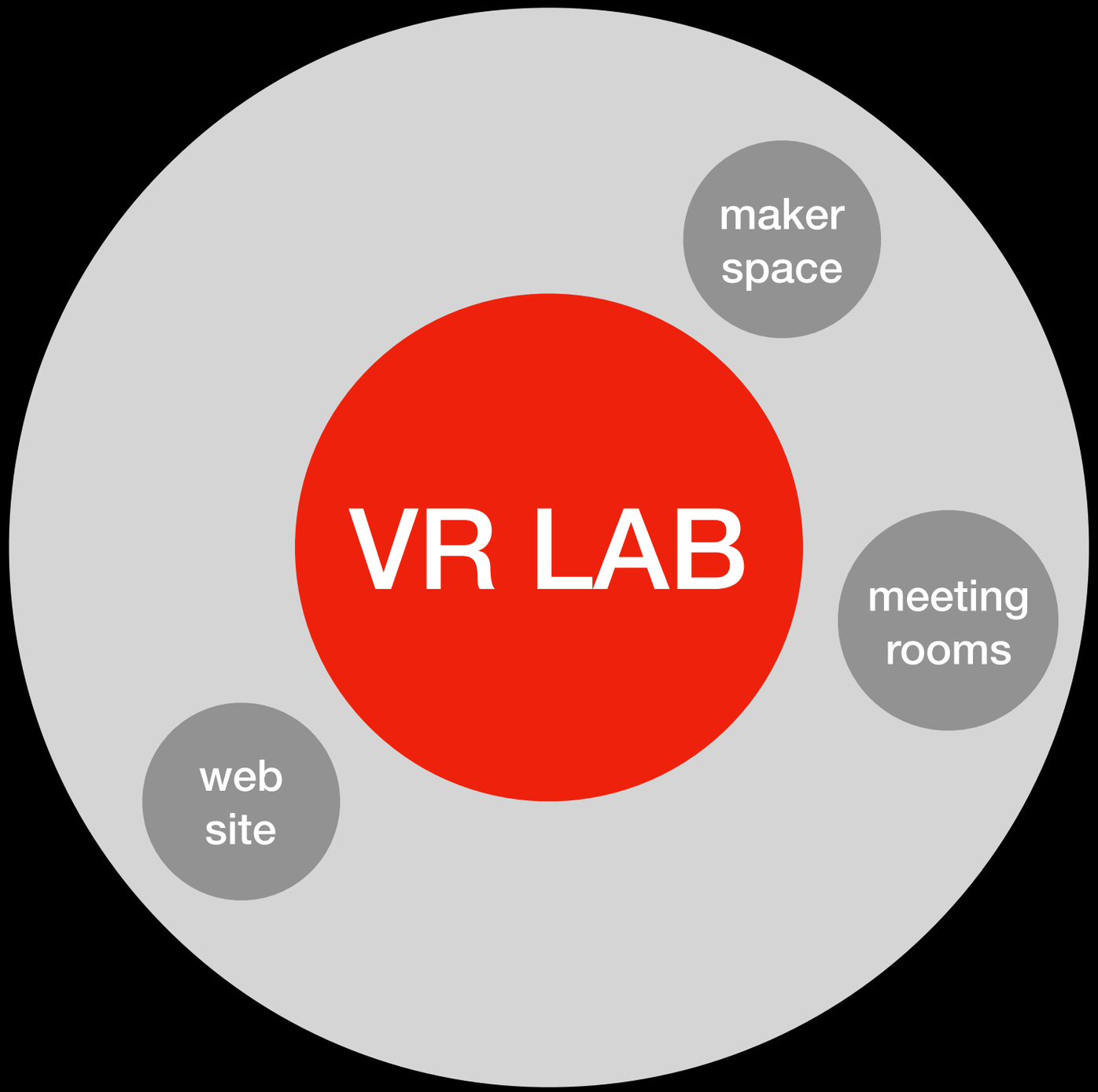
NATIONAL CIVIL RIGHTS MUSEUM
MLK50
1968 - 2018


STOP N SHOP
DEL Grocery
I AM
A MAN
I AM
A MAN
I AM
A MAN
I AM
A MAN


I AM
A MAN


1968

RESEARCH + **TEACHING** + SERVICE



NC State College of Design: Graphic Design Studio

GD 201 is an introduction to Graphic Design course that emphasizes the relationship between people, their context and designed objects. Specifically in GD 201 the student must develop a clear line of research about these basic context areas:

+ social context
+ cultural context
+ technological context
+ historical usage or practices

Susan Robertson Lyons

AXIS

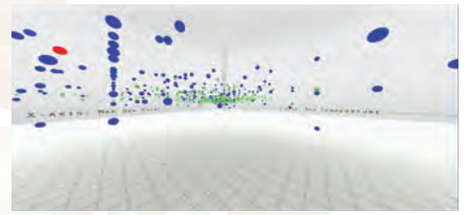
VIRTUAL REALITY

Axis is a data visualization tool for Oculus Rift, that allows users to interact with their data in an immersive virtual reality environment.

Axis translates multi-dimensional data into a sensory experience using variations in position, scale, color, sound, and movement.

The user experience consists of a ***configuration mode***, in which the user can locate variables from a data library and input them into a data visualization. After configuring the inputs, the user enters the ***experience mode***, in which he or she can walk through and experience their data at human scale.

Oculus Rift Virtual Reality Headset by Oculus VR



Unity 3D Prototype
To demonstrate the concepts behind Axis, I created a prototype using Unity 3D, a cross-platform game engine. To translate a data set into a 3D visualization, I wrote a script that parses through a tab-delimited data file and instantiates a marker for every row of data. The position of the marker is determined by the values of the columns assigned to the X, Y, and Z-axis. The prototype also supports on-hover labelling, and allows variation in color.

WORKFLOW

Find Data → Input Variables → Specify Rules → Enter VR Scene

CONFIGURATION MODE

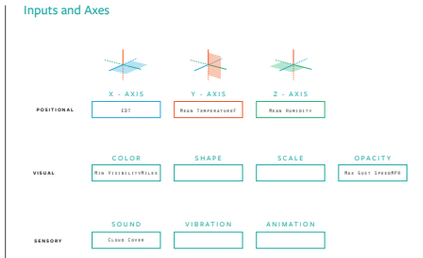
The *configuration mode* is designed to be used with the Oculus Rift headset and hand controller. In this mode, the user can browse and search through their data library and build a data visualization.

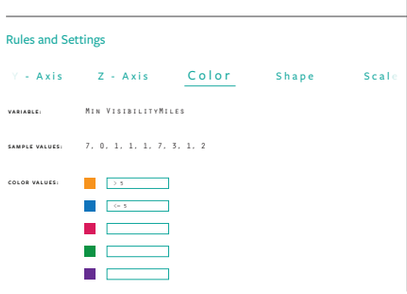
Data Library
Axis organizes data into "shelves" of data. Users can retrieve variables from the library and then input those variables into the VR scene.

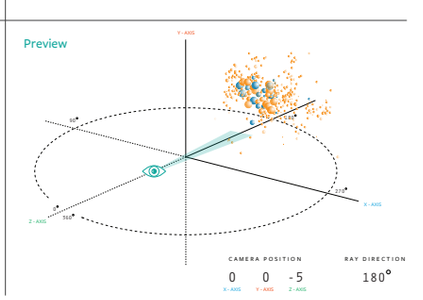
Inputs and Axes
Once the user has retrieved data from the library, he or she can choose which positional, sensory, or visual axis will represent each data variable. The X, Y, and Z axes will determine the position of the data point. Meanwhile, the visual and sensory axes will control the appearance and behavior of the data point.

Rules and Settings
Depending on the data type of the variable, the user can specify how a variable will be represented in the given axis. For example, the user could tell the system to make any data point appear red if it has a MinTemperature greater than 80 degrees F.

Preview
Here, the user can see a birds-eye view of the data visualization and control the location of the camera before they enter the VR scene.

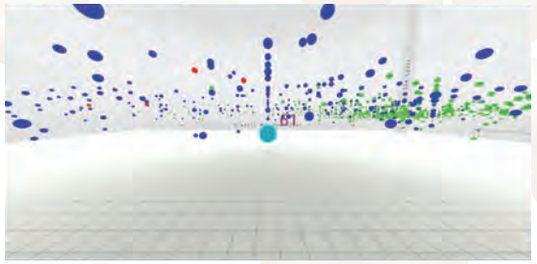


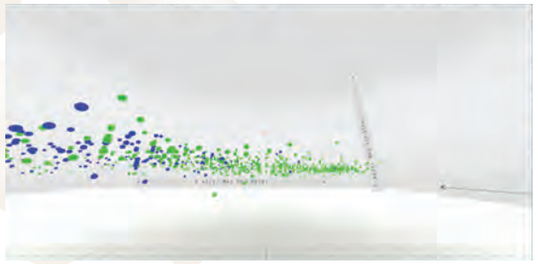




EXPERIENCE MODE

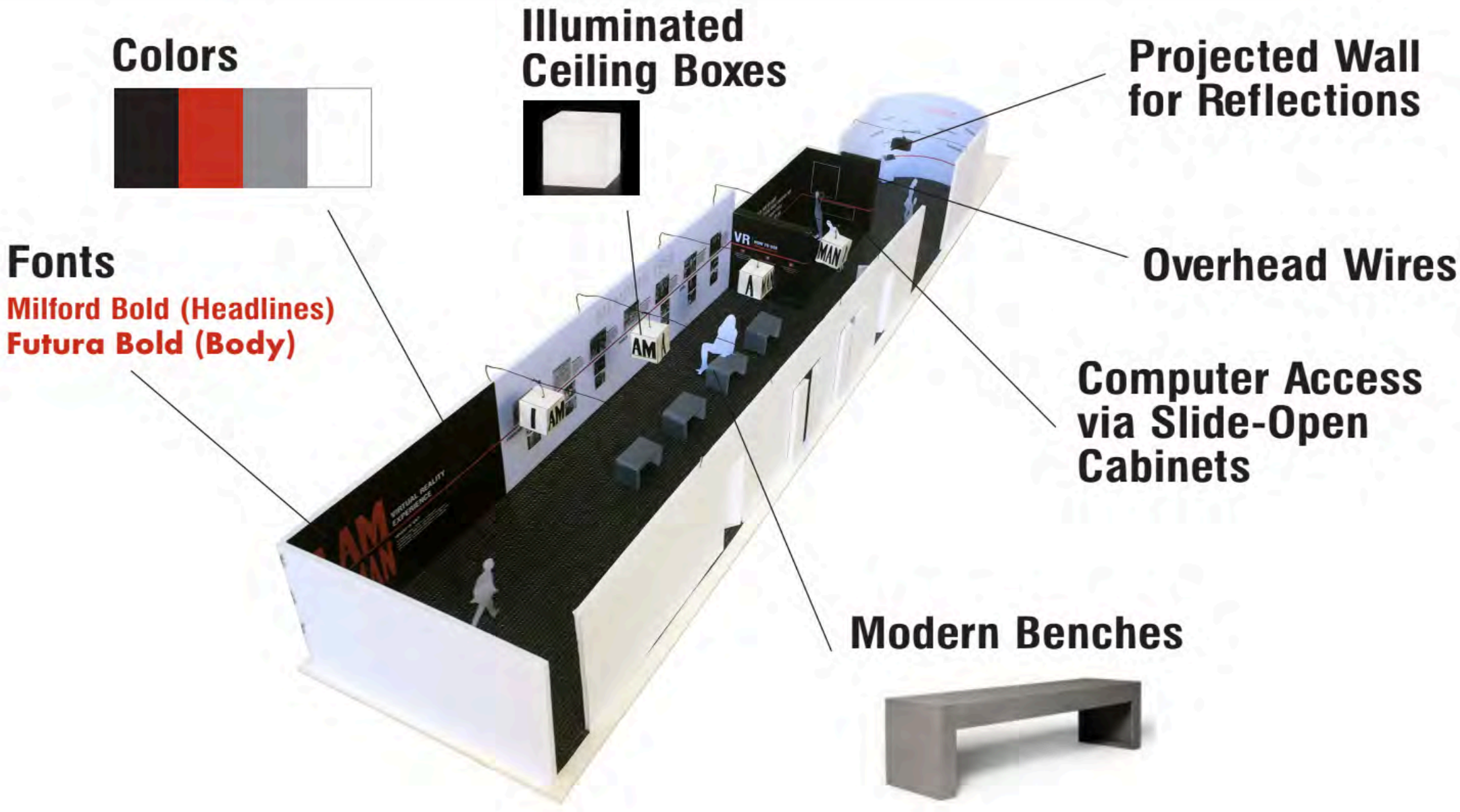
Once the user has configured the data visualization, he or she can enter the VR scene in the *experience mode*. Here, the user can walk amongst the data and interact with it. When the user focuses the camera's raycaster on a data point, information about the data point will be displayed.





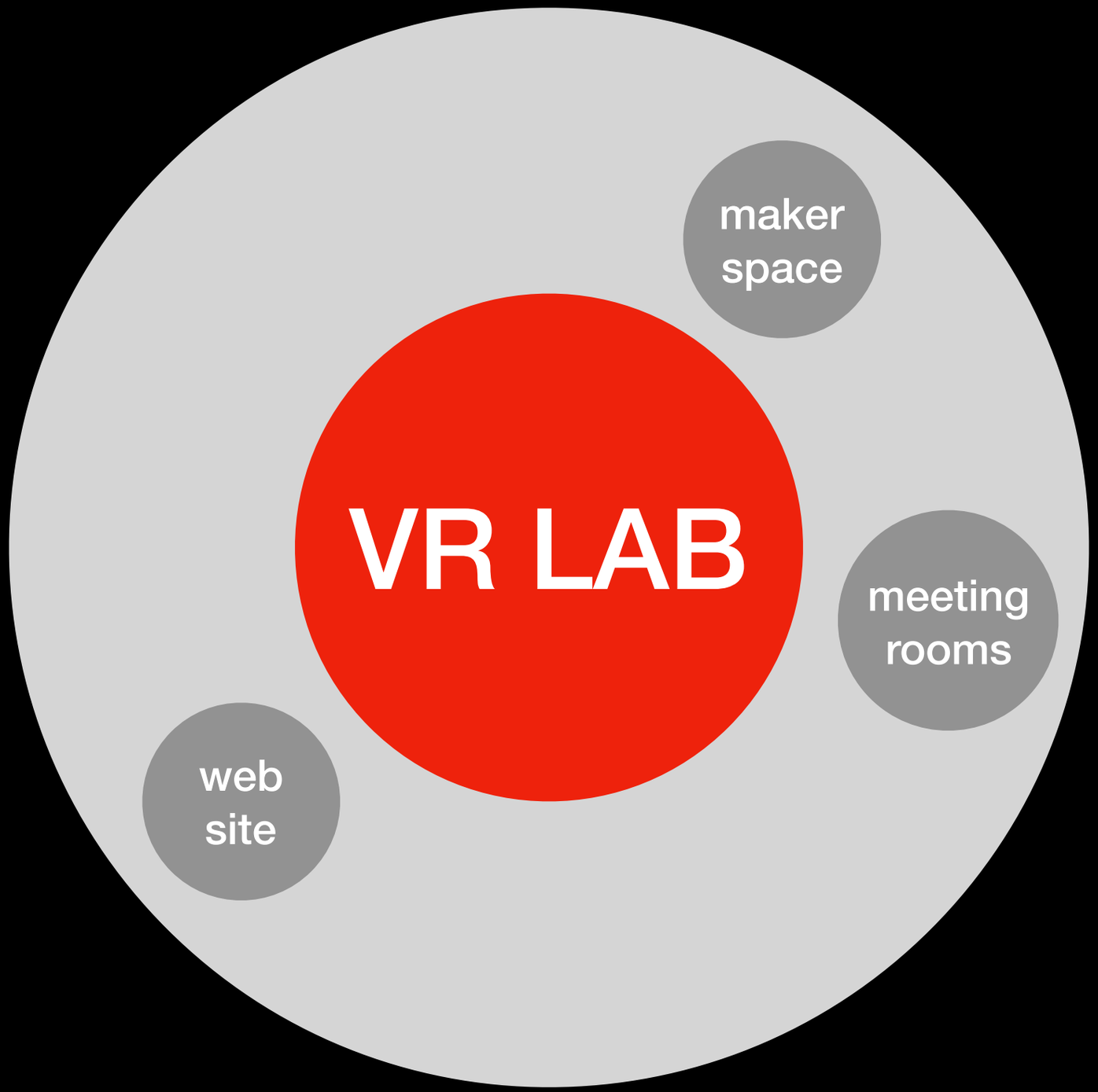
The VR Lab became an essential environment for students to **study** the **spatial concerns** of **VR's use** and **installation in public spaces.**

Student Team Designed Project of VR Installation for Museum Space



Sophomore NCSU Graphic Design Students presenting their winning proposal for a VR integrated museum space.

RESEARCH + TEACHING + **SERVICE**



MSEN Summer Program – VR Lab Field Trip

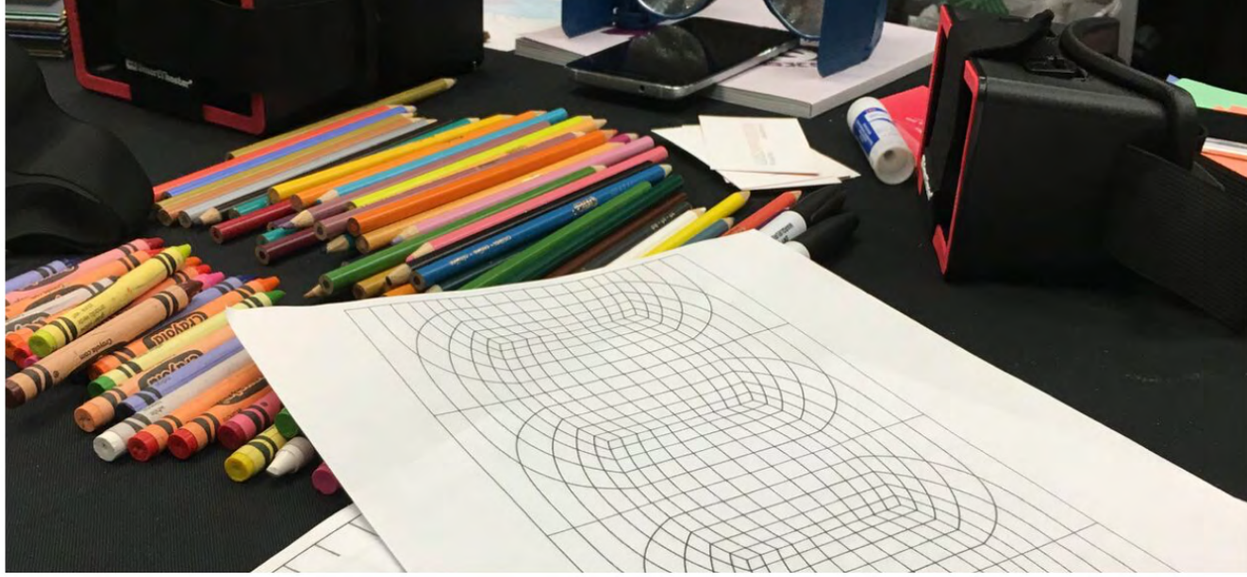
Creating VR content is important to learning

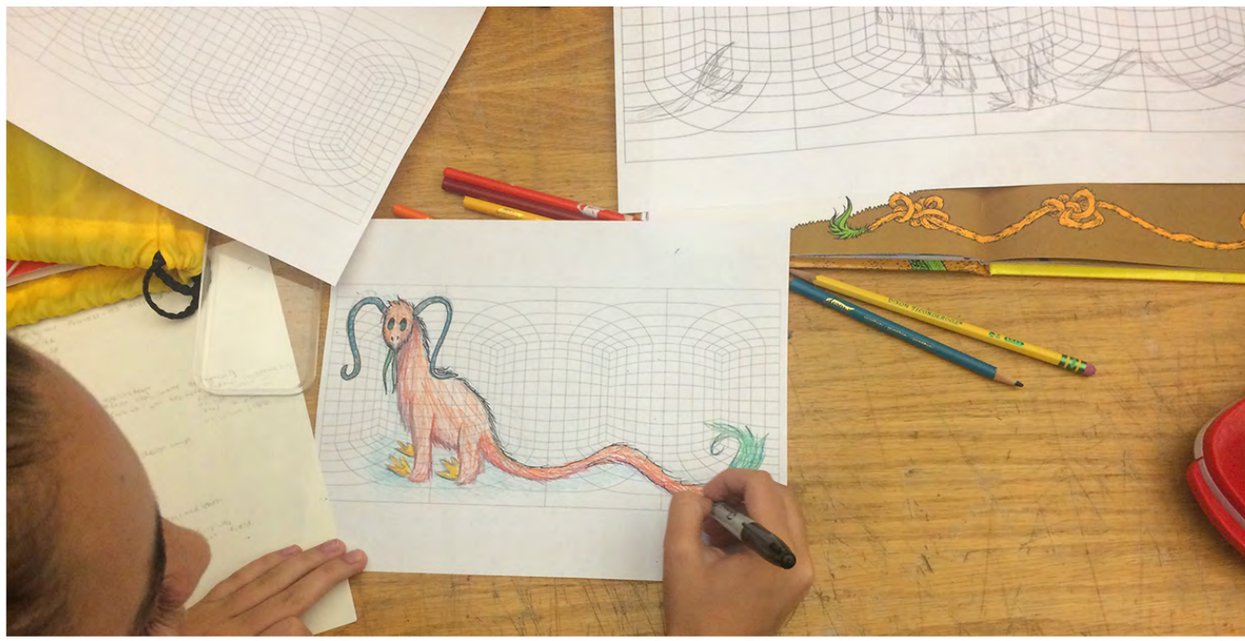
PANCFORM™

virtual reality for

EVERYONE


SAY HELLO TO A WHOLE NEW WORLD
NCSU K12 DESIGN LAB
STAY ON TARGET!
THAT'S NO MOON IT'S A SPACE STATION



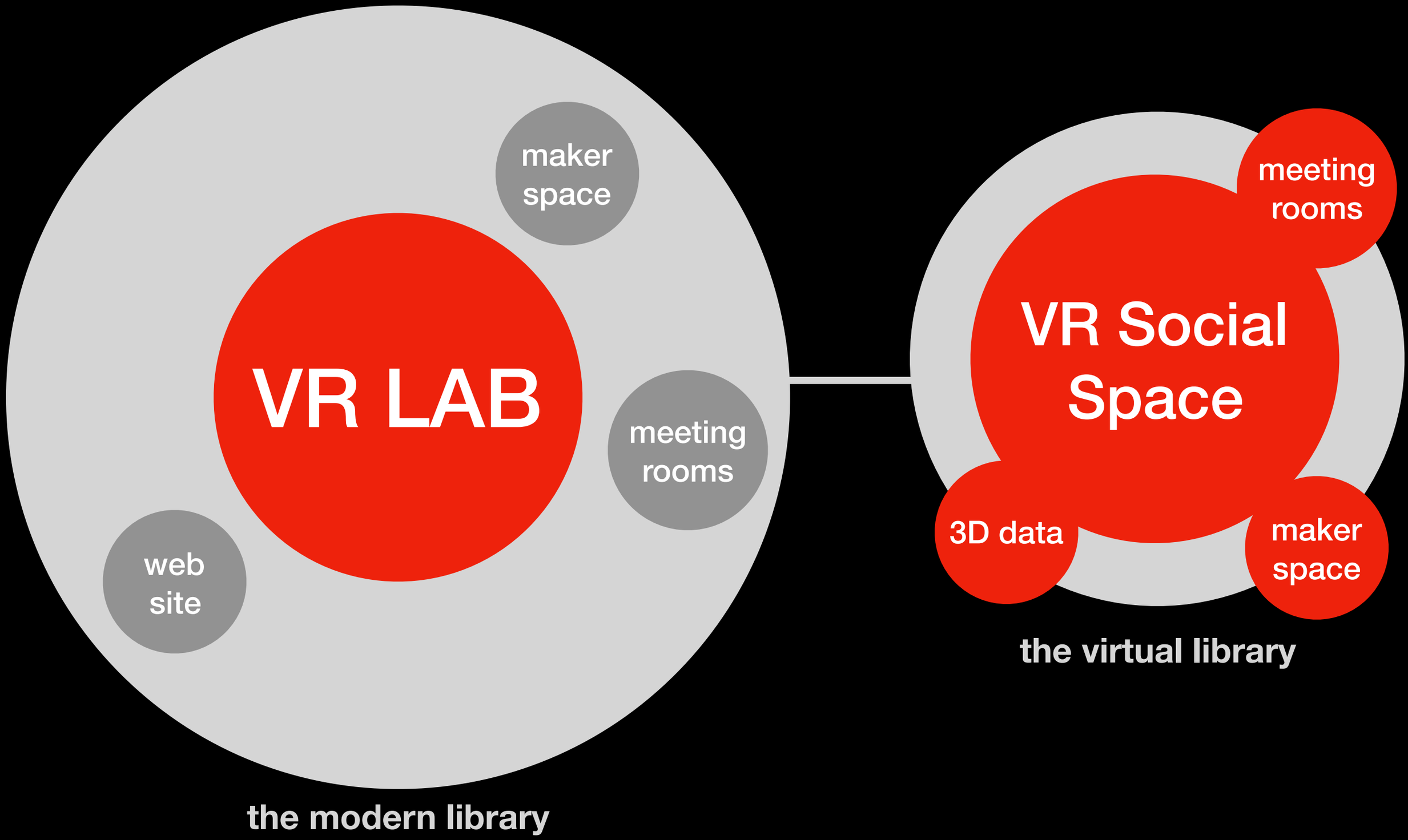


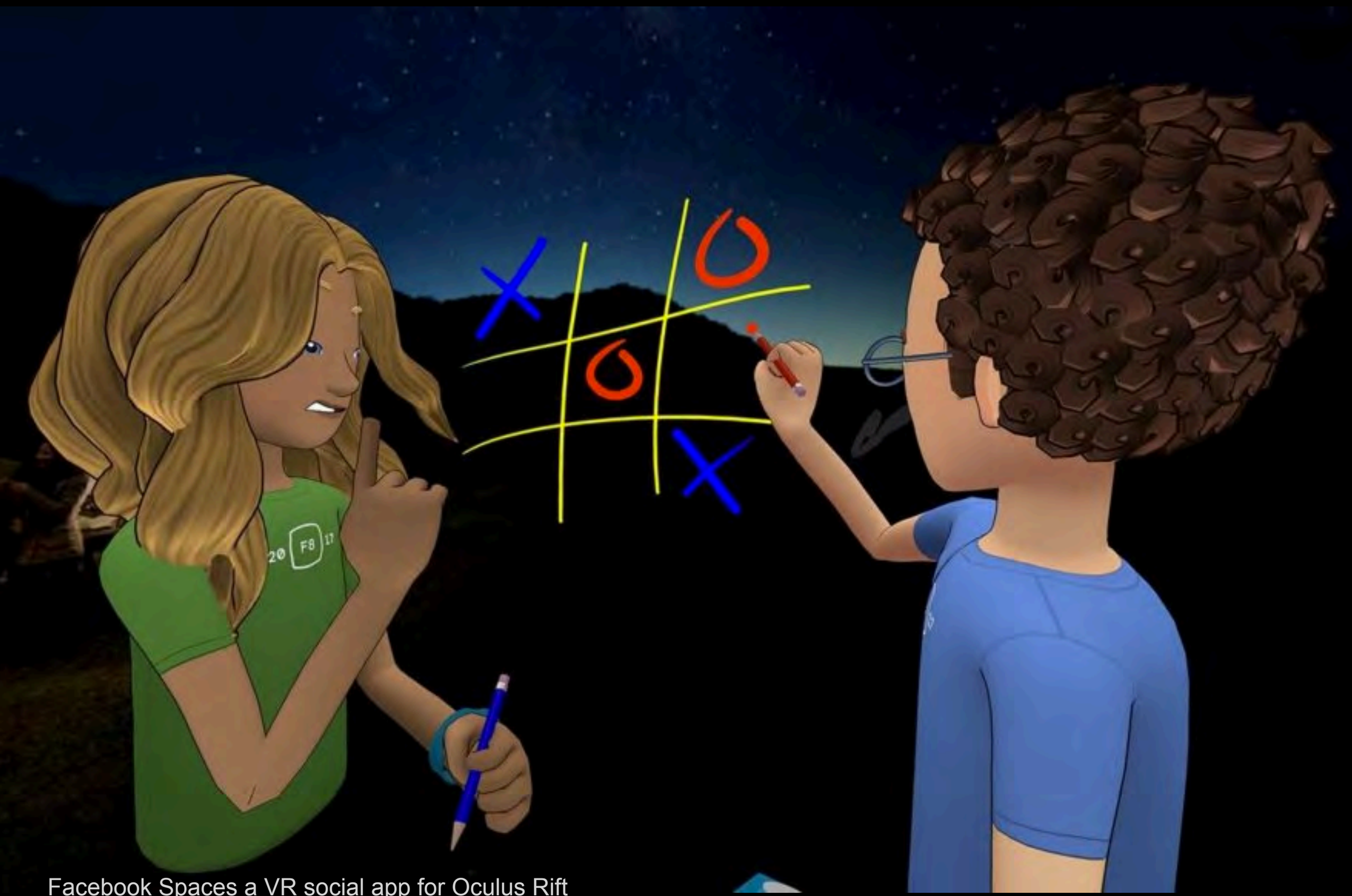
Evolution of “Space”

One must ask **when will the virtual space serve as an extension to the physical space in the form of a new VR Library** as we see virtual socialization, work, and entertainment platforms grow.”

Dr. Derek Ham

Evolution of “Space”





Facebook Spaces a VR social app for Oculus Rift

Alt Space VR - Virtual Meeting Space across all VR platforms, mobile, and desktop