# Visualization of Material Collection

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## I. Introduction

### The History of Applied Visualization Laboratory

- contains immersive environment for many applications.
- For many engineers viewing their work in a 3d format can assist in deep analysist in their research.
- CAES first visualizations lab referred to as CAVE open its doors in 2010 and later updated in 2017.

### Exciting Technical Challenges

- To provide researchers from universities

and other agencies a way to approach
those challenges through new perspectives.

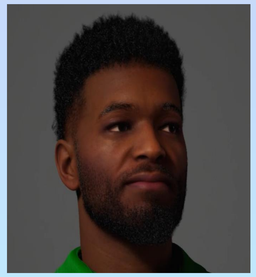
### Potential of Visualizations Lab

- the potential to be a forefront runner in

most aspects of the scientific community.

- Training, data analyst, engineering

and even cyber security are just some of the examples of projects that visualizations lab is working on.



Metahuman created with new technologies that implement real scans of real people

Environment I created from unreal Quixel bridge software

### My project

- I created an environment where we can see firsthand the benefits that come with using visualization as tool.
- The betterment of science and the safety of human life which is the most important aspect.

Cohort of REU program all real scans came from my phone

## II. Challenges

### High processing power

- My old computer was crashing at every turn making my progression slow
- bought a new laptop which helped
- I could not transfer such large files
- I had to restart my project.

Picture demonstrating my desire to destroy my old laptop

### The learning curve

- first time working with

unreal so to be frank I had no idea how to approach my work

- guidance of my mentors and grad students helped I was given a direction to follow and that helped immensely.
- Programing with blueprint
- Making colliders to interact with the object's assets such as the box and Radiation material.
- Knowing when object interacted with one another.

Showing the challenge of approaching high dosages of radiation with the human body

### Applying proper Controls

- Appling into my project that would make it user friendly was another challenge I had to google many tutorials that were unrelated to my project and modify the usage to use it in my creation.
- Such as opening a box in a safety training making it easy for all to see.

### Skills I developed

- Object creation

Which are 3d assets made from complex data structured and nanite technology that can help mimic physics

- Colliders

Are basically a radius constructed to interact with object when their assets approach a proximity to said object to create a function

- Blueprint manipulation on said functions.

## III. Solution

### Remove the risk

- humans are susceptible to many risk including exposure and mistakes unintentionally made if
- we remove the human interaction of collecting hazardous material not only it is safer for people
- which is paramount but it also takes out the possibility of mistakes from complacency.

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### Using robotics

- using a rover in future to take this task and be controlled automatically to collect the material and deposit it in a safe location.

"Leo Rover" (https://skfb.ly/o7F8p) by Leo Rover is licensed under Creative Commons Attribution (http://creativecommons.org/licenses/by/4.0/).

"Rover, Papercraft method test" (https://skfb.ly/Tnoz) by Lite is licensed under Creative Commons Attribution (http://creativecommons.org/licenses/by/4.0/).

### Having to swap the rover for user friendly interaction

One extra challenge for the program to run smoother on simple devices I replaced the rover with a simpler design so this could be shared as a demonstration across most platforms

## IV. Conclusion/ Future Work

The concept of robotic collection isn't new but with this project we can demonstrate visually and contemplate better solutions and increase the safety for all.
For the future working with the programing and including this in a virtual setting where anyone across the world may join.

## V. Acknowledgements and References

**This work was supported by State of Idaho appropriated funding for the Center for Advanced Energy Studies (CAES) and the NSF REU Site Award #2051090 for Advanced Manufacturing for a Sustainable Energy Future; this research utilized equipment at CAES provided by the Idaho National Laboratory (INL) under the Department of Energy (DOE) Idaho Operations Office (an agency of the U.S. Government Contract DE-AC07-05ID145142;** [1] Dr. David Estrada, John Koudelka [2] Rajiv Khadka, Xingyue Yang