

# DYNAMIC LUMINESCENCE

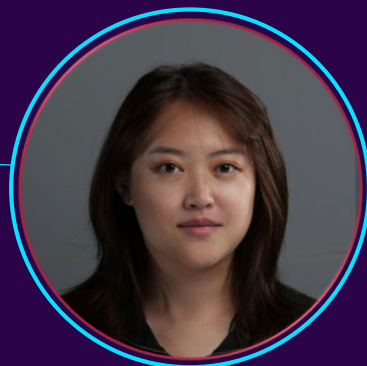
TEAM LUMINATTI

# TEAM



**Sy Suo**

Producer



**Stefani Wang**

Artist



**Jiajian Zhang**

Programmer



**Quoey Wu**

Programmer



**Chloe Cho**

Artist

# COLLABORATOR/ ADVISORS



**Mikael Owunna**

Collaborator



**Marques Redd**

Collaborator's Producer



**Heather Kelley**

Faculty Advisor



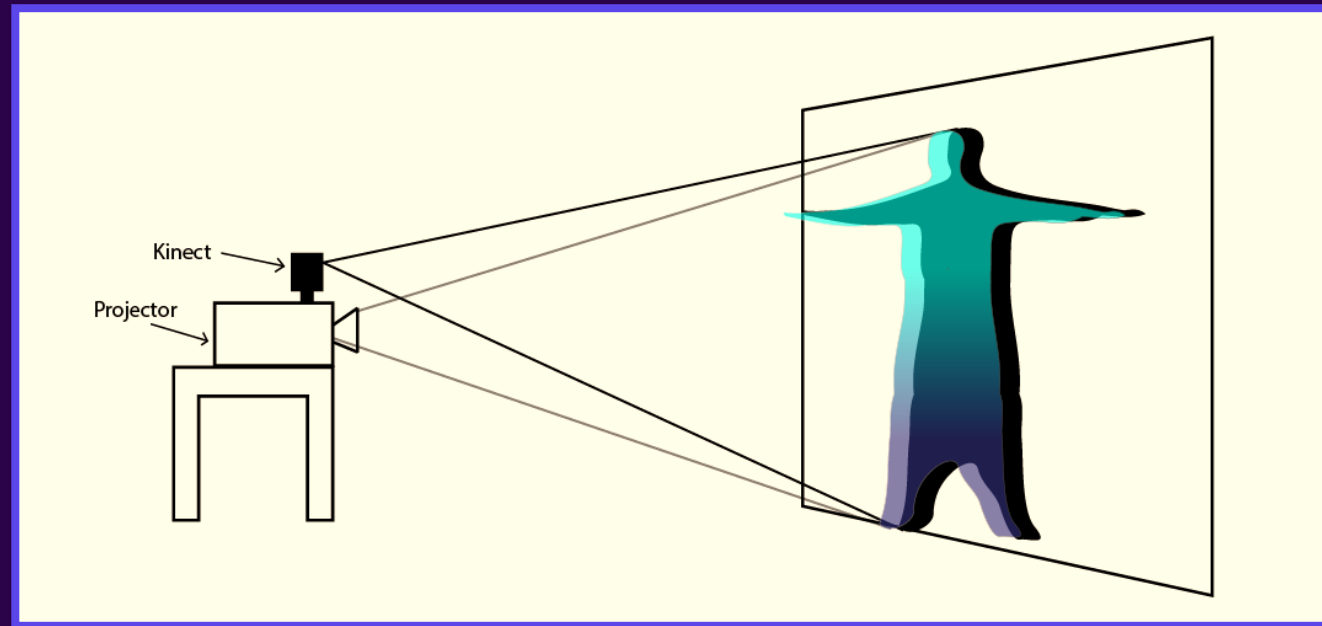
**Moshe Mahler**

Faculty Advisor



# PROJECT GOAL

- Project visual effects onto four dancers
- Reflect Traditional African Cosmology



## ARTIST'S PRACTICE

Mikael Owunna is a Nigerian American multimedia artist, filmmaker, and engineer. Exploring the intersections of technology, art, and African cosmologies, his work seeks to elucidate an emancipatory vision of possibility that revives traditional African knowledge systems and pushes people beyond all boundaries, restrictions, and frontiers.

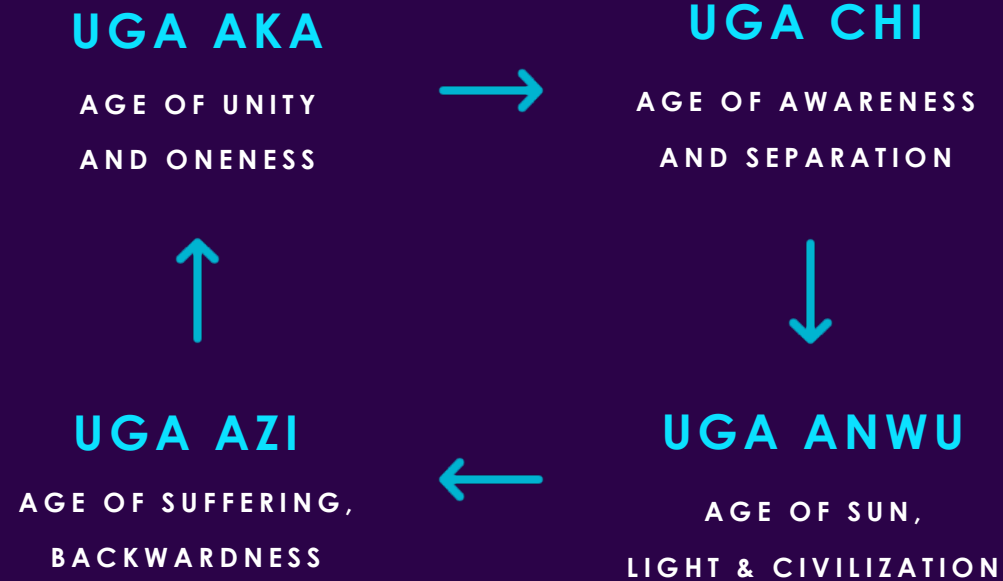


# MIKAEL'S WORK



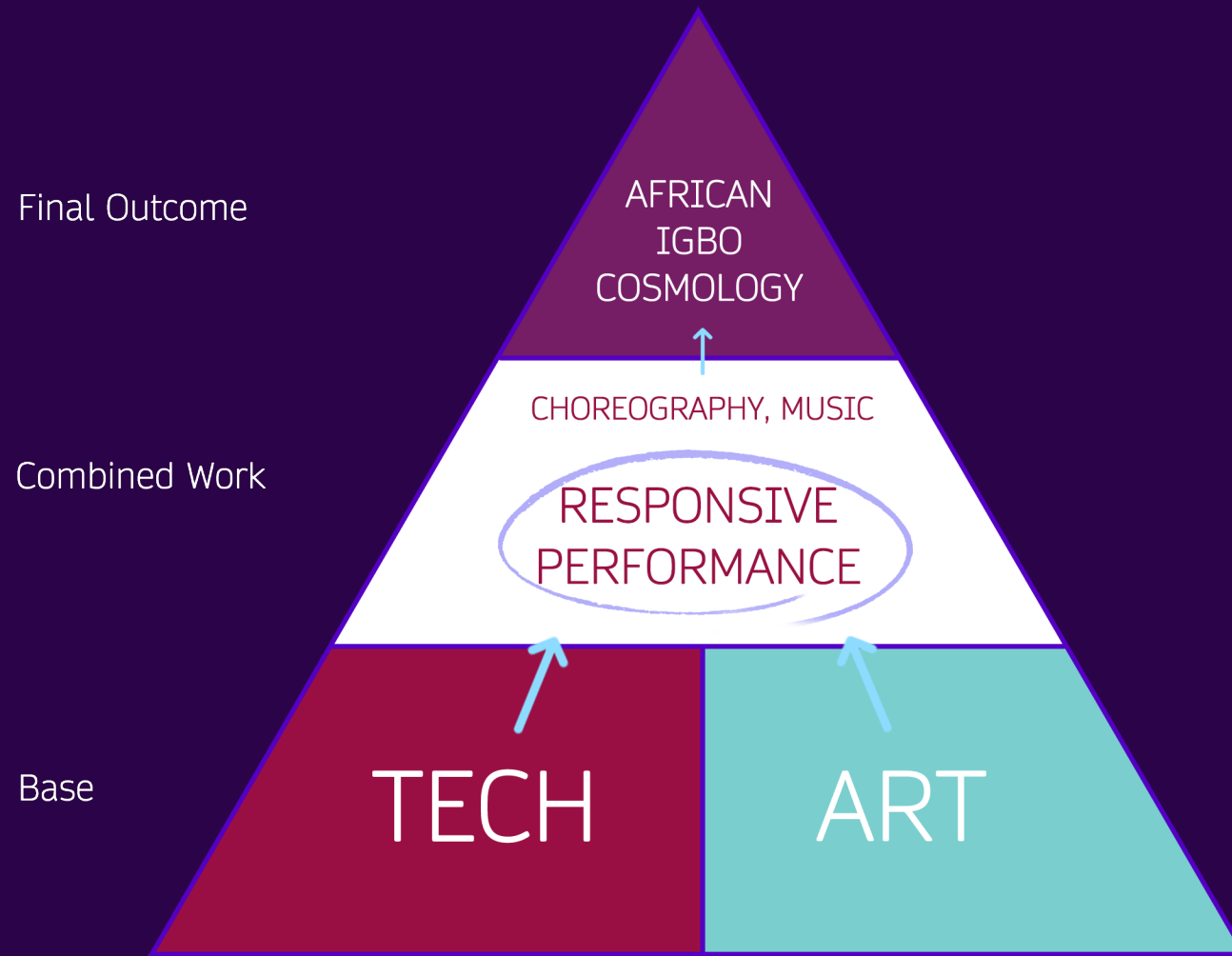
# AFRICAN IGBO COSMOLOGY

## THE FOUR WORLD AGES





# MIKAEL'S VISION





# TECH AND ART

## TECHNOLOGY

Azure Kinect for motion tracking

TouchDesigner generates visuals

Projector maps the visuals

## ART

Create 4 sets of visuals

Tell the story of African Igbo Cosmology

# PROJECT DELIVERABLES



## Control Panel

A user-friendly [control panel](#) to control the sequences



## Visual Treatments

Four sets of [dynamic visual treatments](#) to project onto the performers.



## Source Code

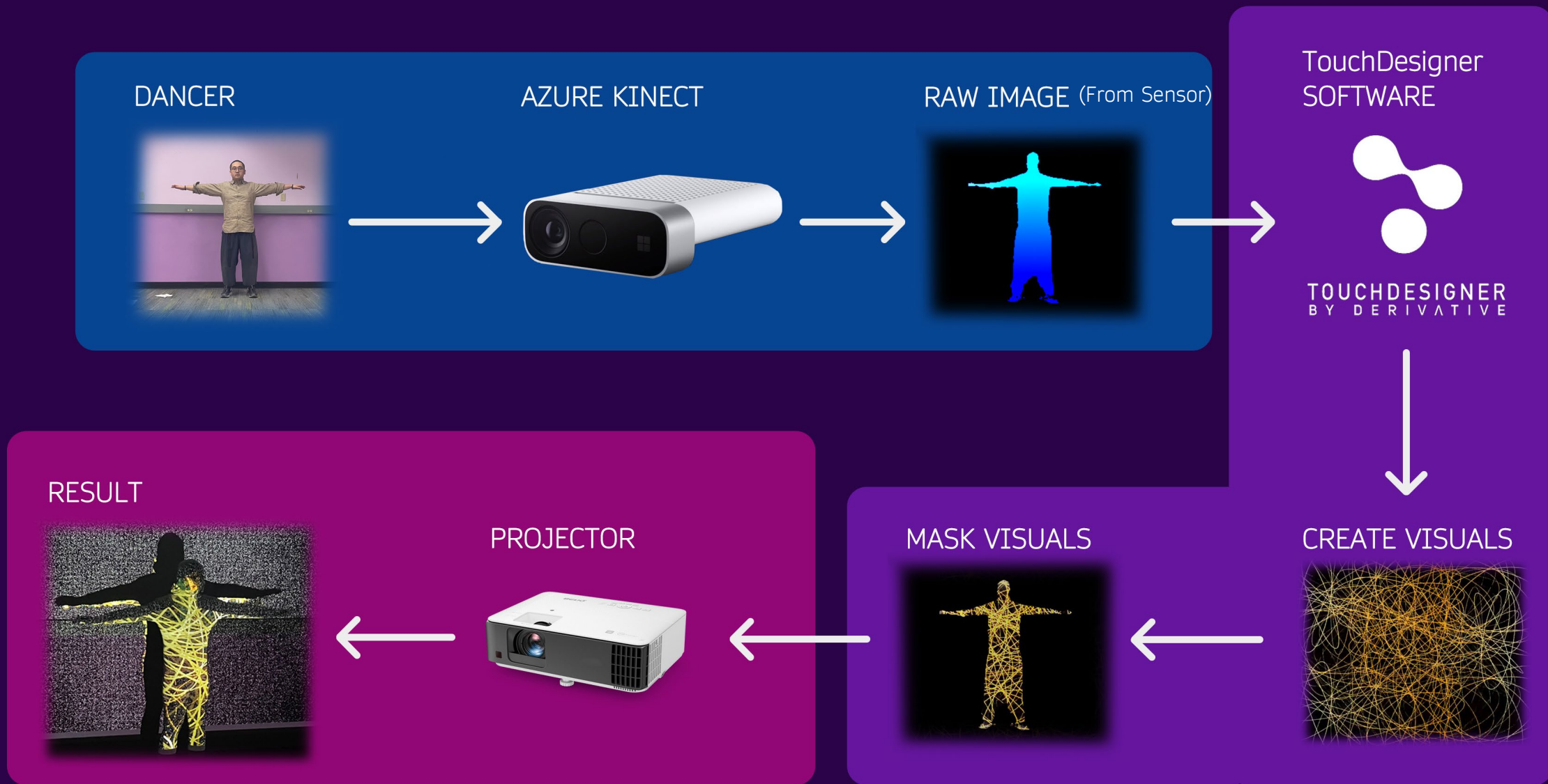
All the [codes](#) and [plugins](#) for the system to work.



## User/Install Manual

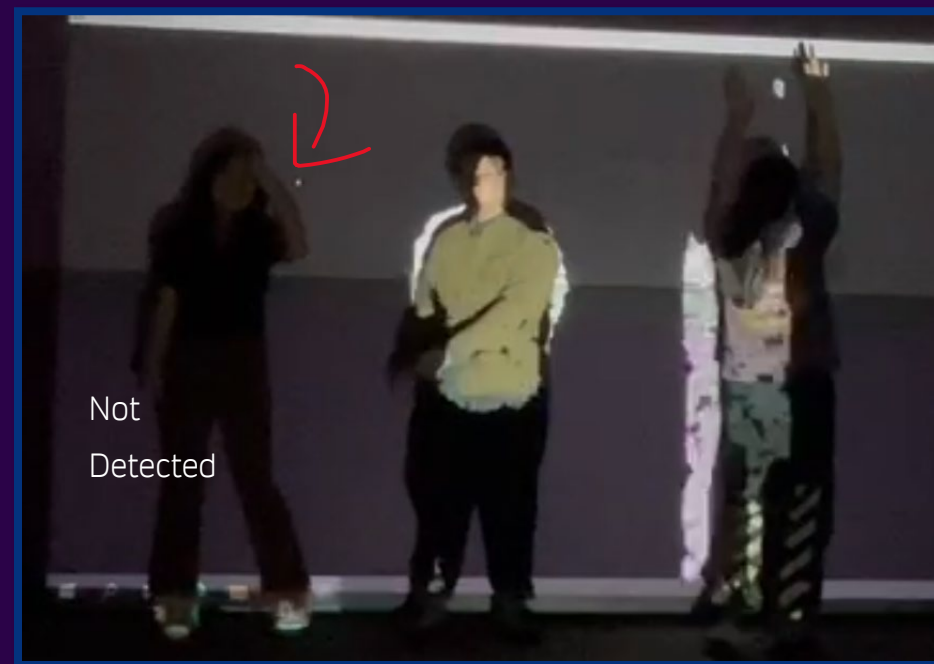
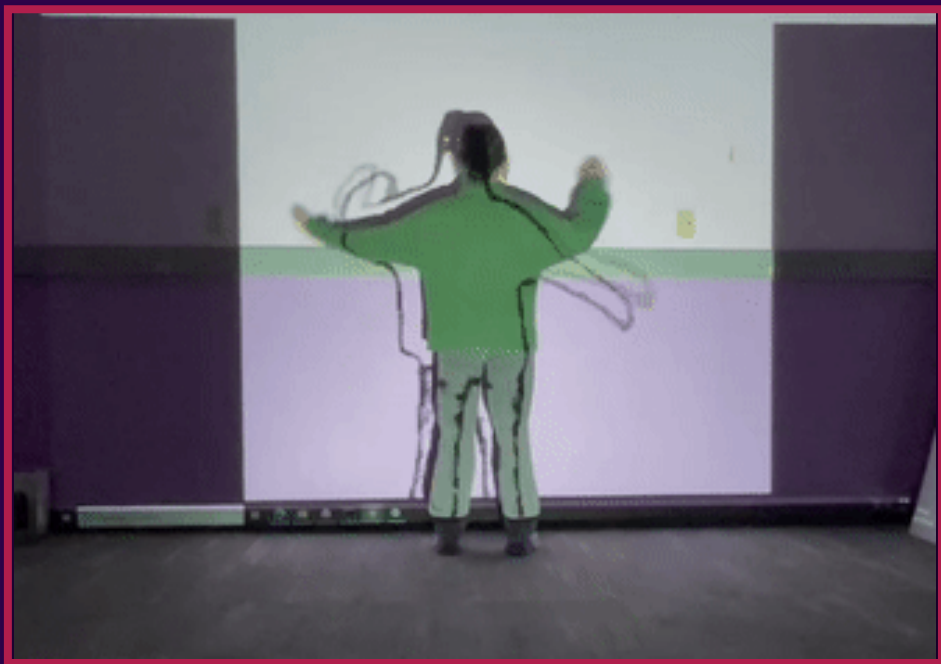
How to [install](#) the piece, necessary [hardware](#), and how to adjust the specs.

# TECH BREAKDOWN



# TECHNICAL CHALLENGES

## LATENCY & ACCURACY

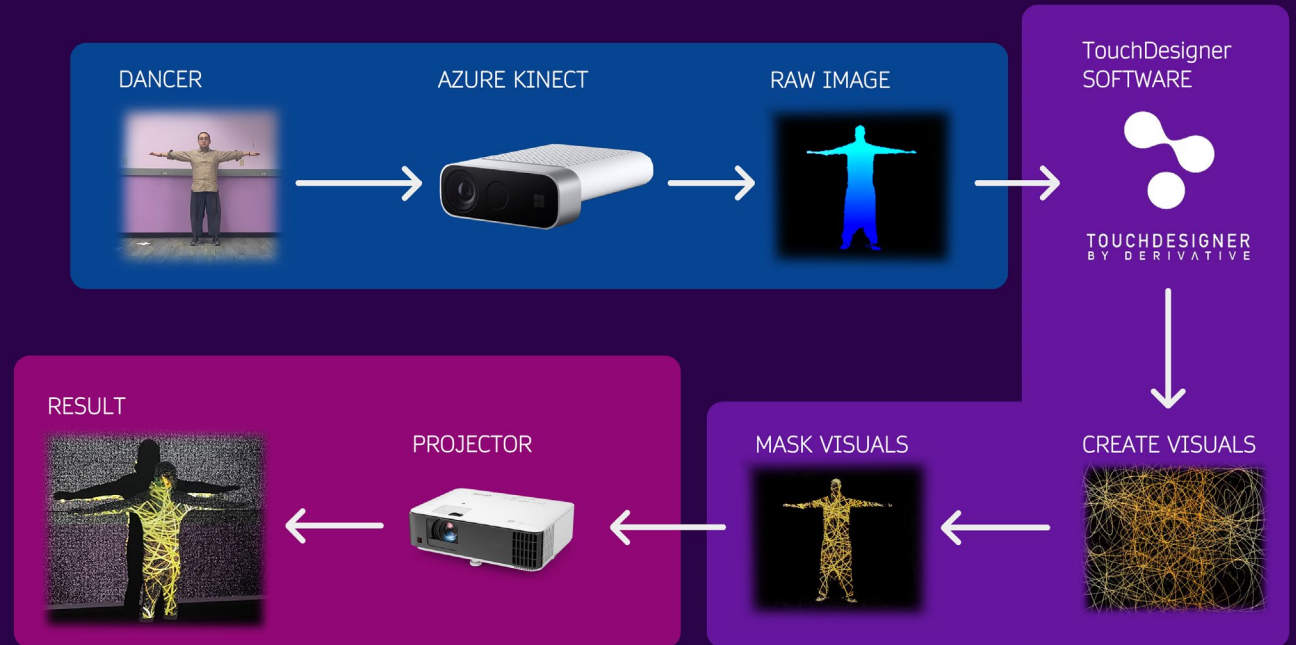




# TECHNICAL CHALLENGES

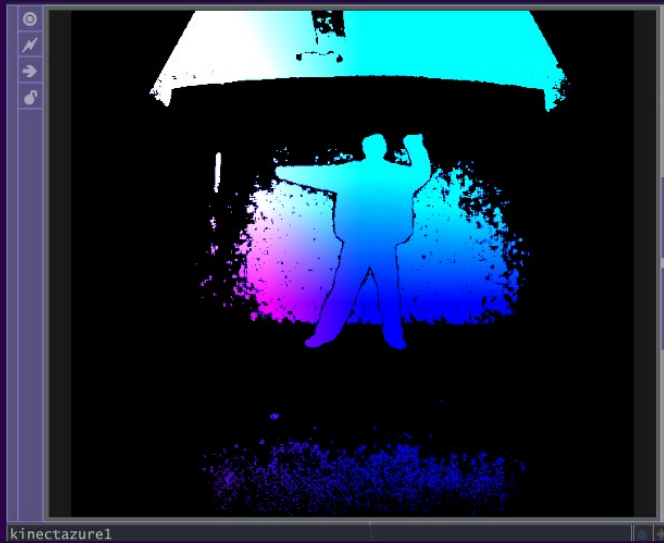
## LATENCY & ACCURACY

- Gaming Projector
- Optimization of Visuals
- Customized Body Segmentation Algorithm

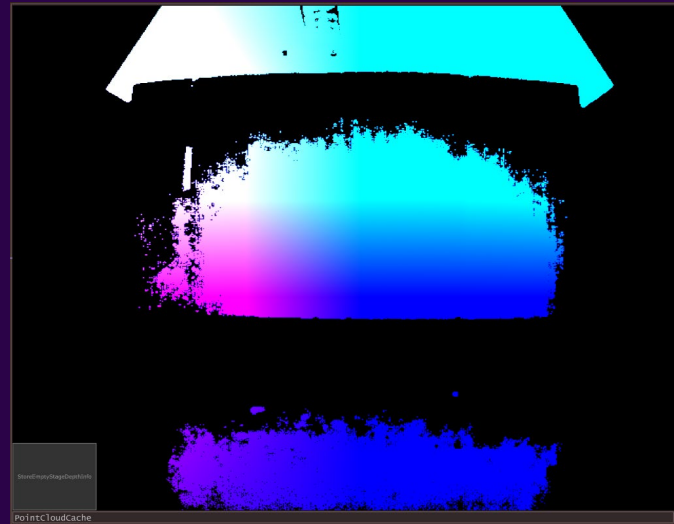


# TECHNICAL CHALLENGES

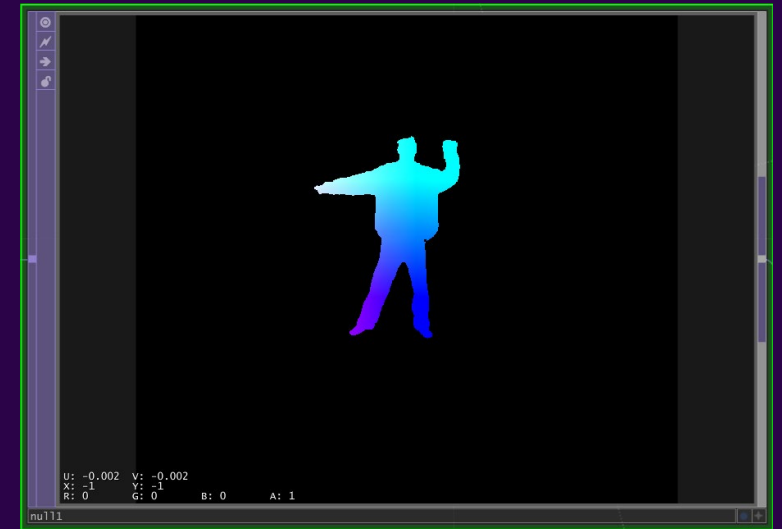
## Body Segmentation Algorithm



Raw Depth Image



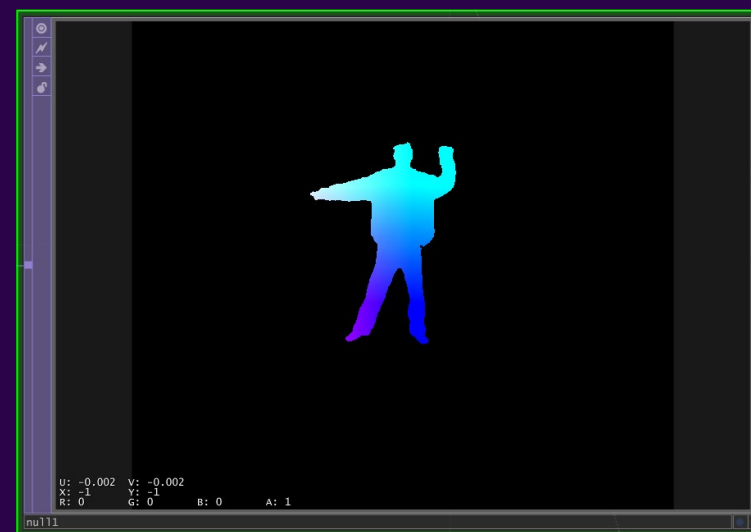
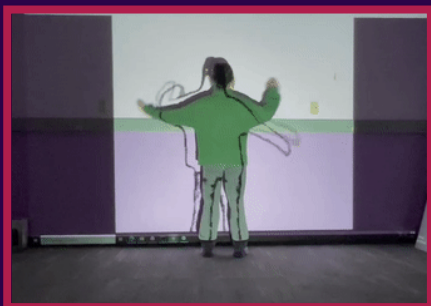
Pre-Cached Stage Data



Clear Body Mask

# TECHNICAL CHALLENGES

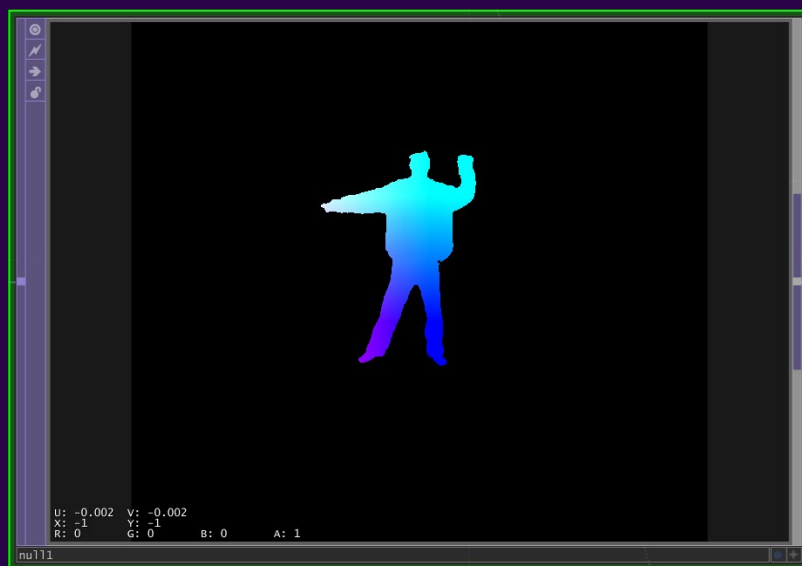
## LATENCY & ACCURACY



- Solved (✓)
- From 240ms to < 40ms

# TECHNICAL CHALLENGES

## Calibration



Body Mask



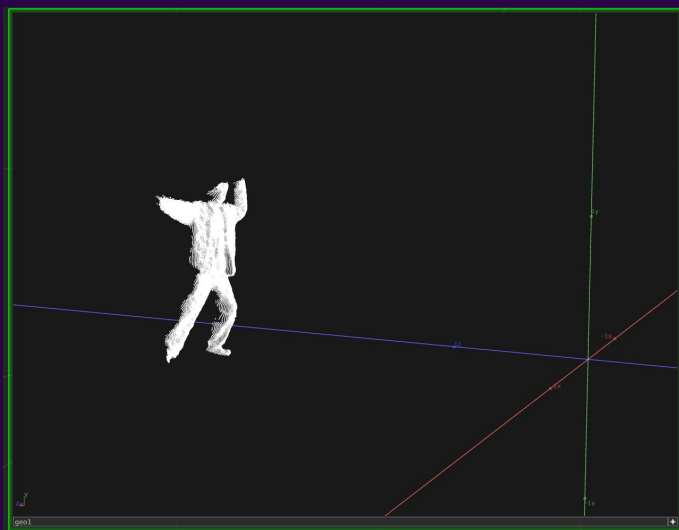
Projected without Calibration



# TECHNICAL CHALLENGES

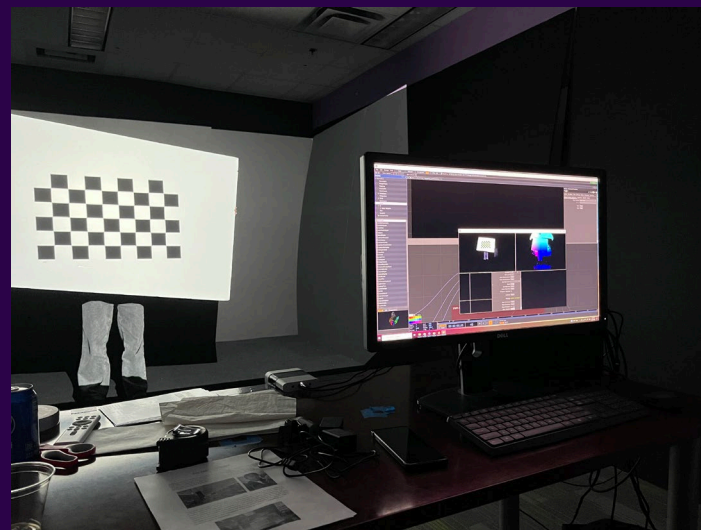


## Calibration



3D Reconstruction

+



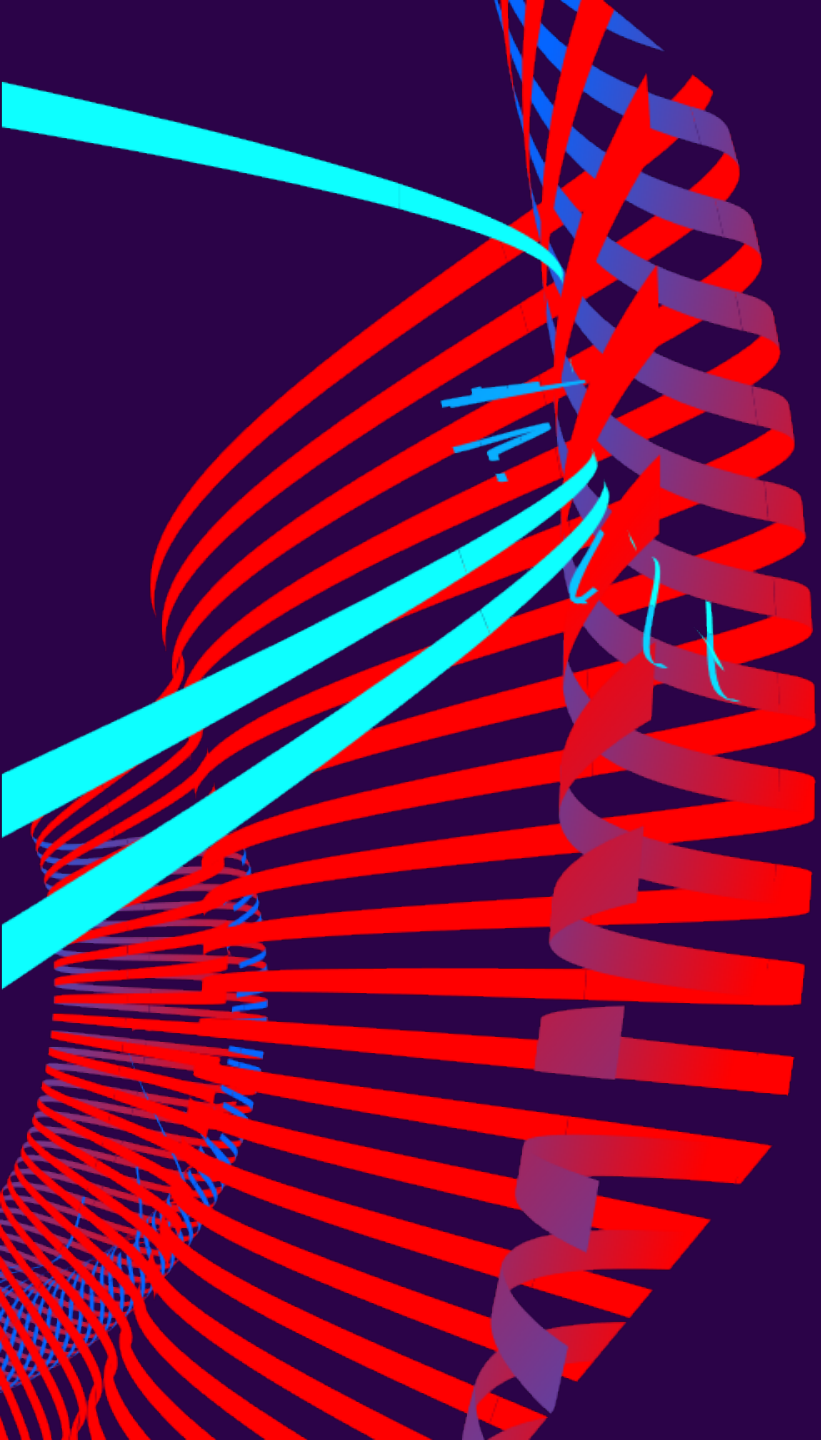
Projection Matrix of Projector

=



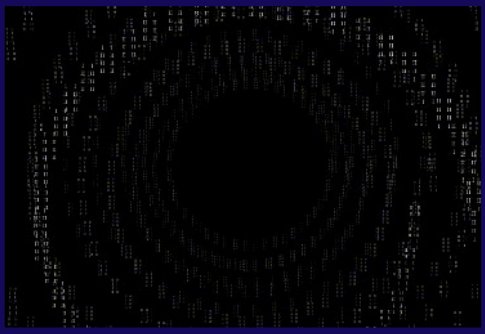
Perfectly Matched Visuals

# VISUALS



# 4 SETS OF VISUALS

African Igbo Cosmology



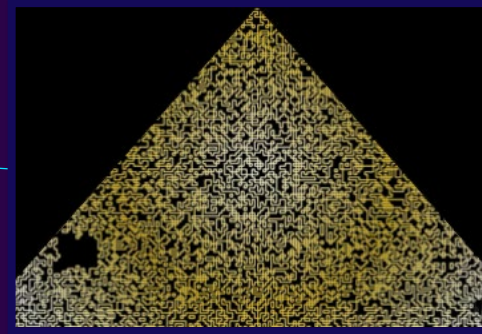
## Uga Aka

Age of Unity  
and Oneness



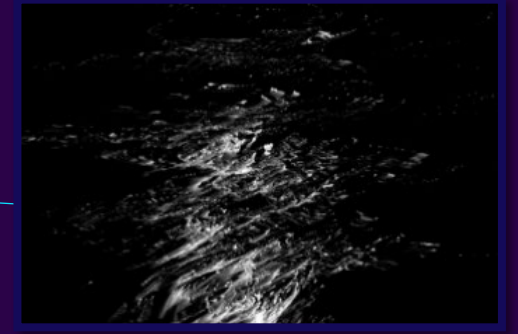
## Uga Chi

Age of Awareness  
and Separation



## Uga Anwu

Age of Sun,  
Light & Civilization



## Uga Azi

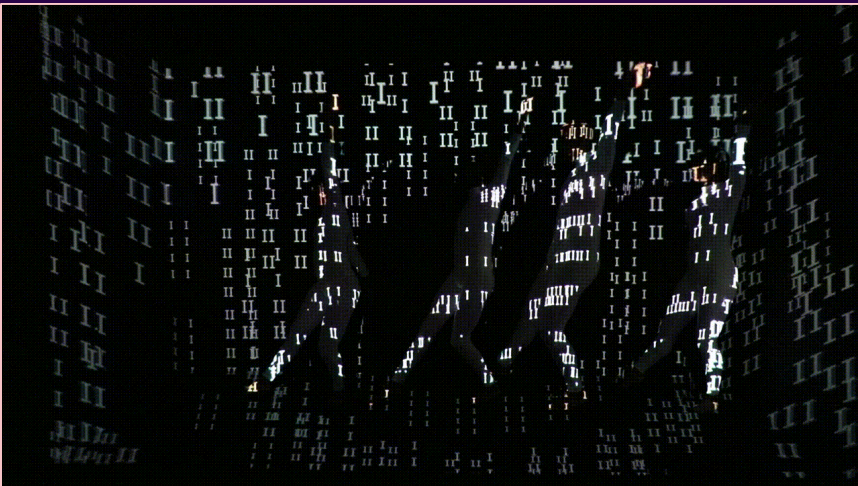
Age of Sufferness,  
Backwardness

# ACT 1, UGA AKA:



Unity and Oneness

Visual 1:  
Cosmic/Starry Pattern



Visual 2:  
ODU Pattern (Binary)



## ACT 2, UGA CHI:

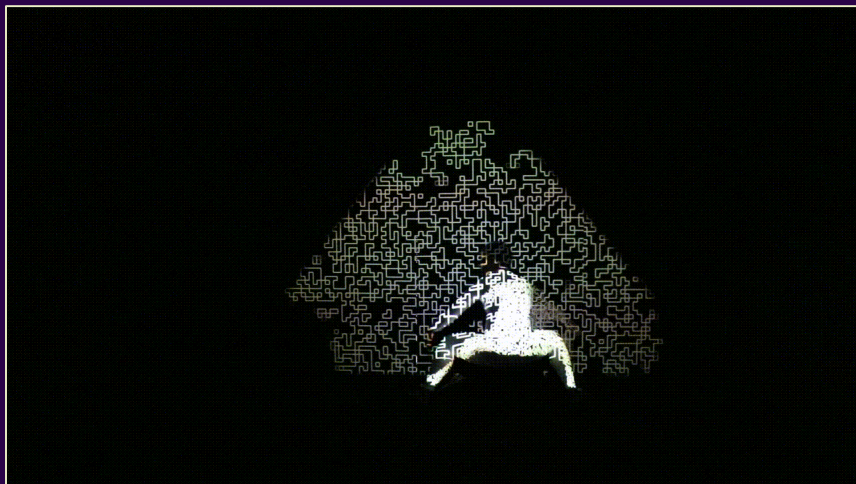


### Awareness, Separation, and Death

Visual:

- Dotted Outline
- Hollowness of Bodies

# ACT 3, UGA ANWU:



Sun, Civilization  
and War

Visual 1:  
Squares, Pyramid Symbol



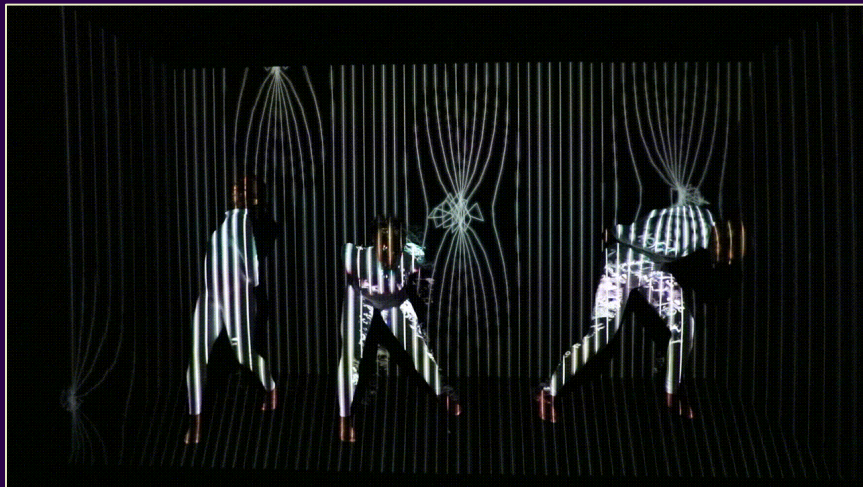
Visual 2:  
Bouncy Lines + Props

# ACT 4, UGA AZI:

## Suffering and Backwardness

Visual 1:  
Tangled Lines

Visual 2:  
Wavy, Snowy





# DELIVERABLE PACKAGE



Control Panel



Visual Treatments



Source Code



User/Install Manual

...therefore, the project can go further!



# DELIVERABLE PACKAGE

## SYSTEM WITH CONTROLLER

- A well-built, functional system
- An easy-to-navigate controller
- Customizable compositions and orders of the visuals
- A set of tools for installing the work in various sites



# DELIVERABLE PACKAGE

## VISUAL TREATMENTS

- 4 Sets of Visuals (with 10 in total)

Individually Unique Visuals From Static to Responsive

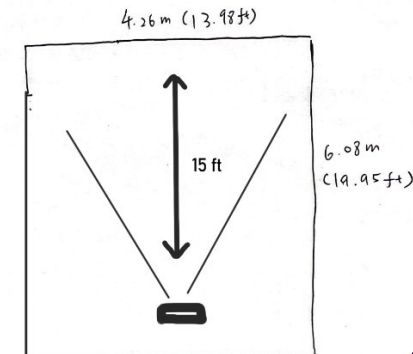
1. Act 1 V1: Starry [Outline]
2. Act 1 V2: ODU Tunnel [Outline]
3. Act 2: Dotted Outline [Responsive, Outline]
4. Act 3 V1: Pyramid [Static + Outline]
5. Act 3 V2: Bouncy Lines [Outline]
6. Act 4 V1: Tangled Line [Responsive, Outline]
7. Act 4 V2: Snowy [Static]
8. Additional 1: ODU Pattern Background + Stars on Body
9. Additional 2: Pyramid Background + Dotted Outline on Body
10. Additional 3: Pyramid Background + Bouncy Lines on Body

## USER MANUAL

- Hardware, Software Walkthrough
- Listed of Recommended Devices and Price
- How to Choose Projector Based On Performing Space
- Installation Guide
- Calibration and Alignment

### Pre-Installation:

1. You have to first determine a **performing space**.
2. Measure the **scale and size** of this space.
3. Figure out the **projection wall**, as well as where you want to place the projector.]
4. Figure out if you want the projector to be projecting from **Top or Ground**.
  - a. **Top** requires a mounting system to place the projector high. The benefit of this is that it creates small shadows of the dancers, while not damaging their eyes.
  - b. **Ground** only requires the projector to sit on the ground at a good angle, but this may cause big shadows. It will also create very strong lighting for the dancers' eyes.
5. With the scale of the room, please go onto the <https://www.projectorcentral.com/projection-calculator-pro.cfm> website to figure out what type of projector to buy/rent.



# DELIVERABLE PACKAGE

## OTHER SERVICES

- Remote Support
- Help Installing in Artist's Studio





# WHAT WORKED WELL

## A Dynamic Control System

A set of adjustable visuals to switch and adapt to various choreography/sites.

## Modular/Improv Choreography

The Choreography is designed modularly to allow fast changes and adaptation to new environment.

## Communication

Regular communication to ensure all the essential information is shared among all teams.

## Innovation & Creative Solutions

Our proposed ideas eventually elevated the dynamic of the performance.

# WHAT WE MIGHT DO DIFFERENTLY

## TouchDesigner?

Unstable performance

Node-based software's flexibility

## Integrating Music and Beat

Integrate Music into the system so the visuals respond to the beat accordingly, to add more dynamic

# WHERE WILL THE WORK TRAVEL:



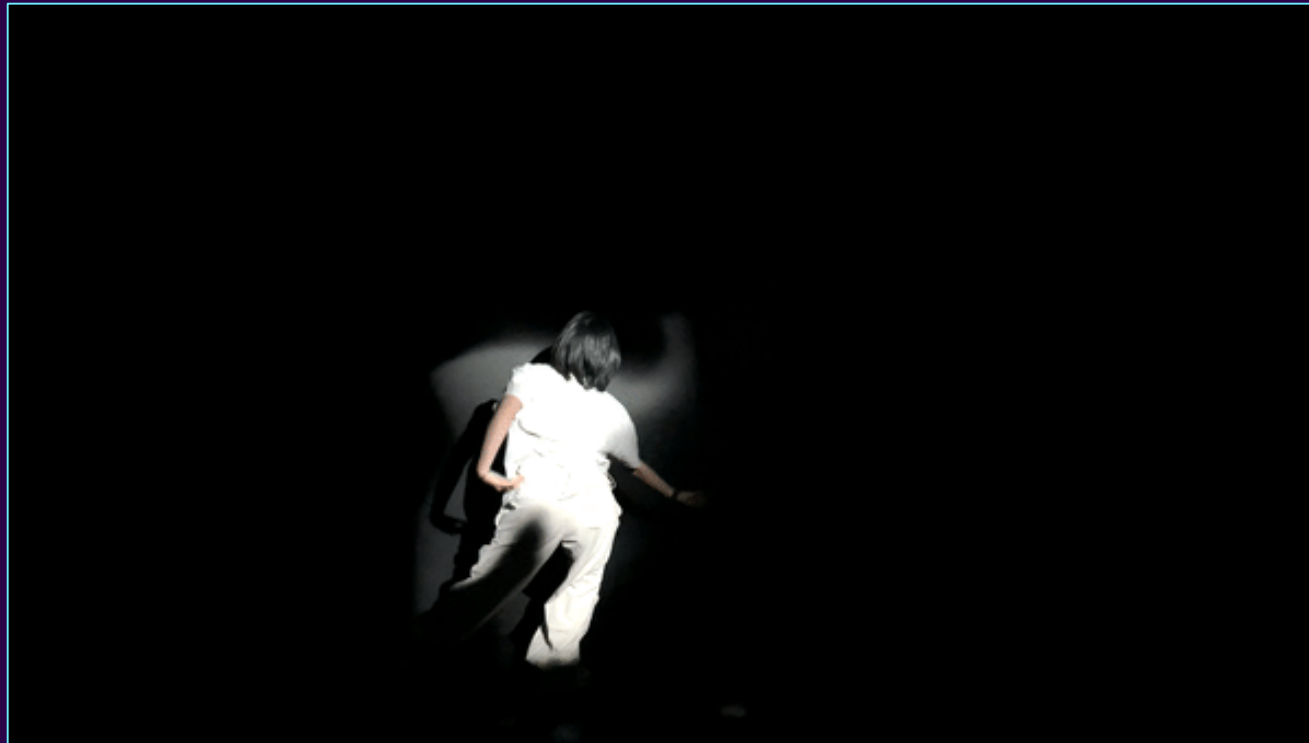
North Carolina Museum of Art,  
Raleigh, North Carolina



Martha's. Vineyard Performing Arts Center,  
Oak Bluffs, Massachusetts

And many more!

# EXPERIMENTING WITH YUXI



Testing:

- How it looks with other genre
- Other uses of this system under different narratives

THANK YOU YUXI!!!



# SUMMARY

- Great Teamwork
- Incredible Collaborator
- Supportive Faculties
- A Well-built System
- A Culturally Significant work

# SPECIAL THANKS TO

Choreographer,  
Dancers, Asst:

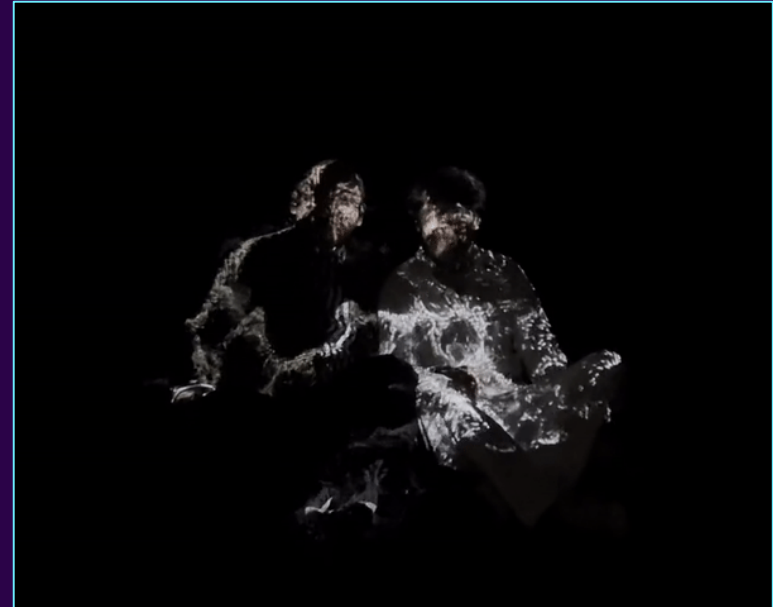
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Dominique Swift

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John Dessler	Ruth Comley

Students:

Yuxi Lee, Yicheng Lu, Rei Yamada



# Q&A

# THANK YOU

TEAM LUMINATTI