

# ANIMATED THREADS: DIGITAL CLOTH APPLICATIONS AS A CREATIVE TOOL IN CHOREOGRAPHY AND COSTUME DESIGN

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# RESEARCH OVERVIEW

- Digital dance costume and its embodied dimension within digital environments
- Explore the intersection of choreography and costume design through the lens of emerging technologies— *digital cloth simulation, motion capture, and extended reality (XR)*
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# THE PROBLEMS

- Usually, costumes are introduced late to rehearsals, dancers must practice without them and imagining wearing them
- Spatial problems might arise especially for large volume/strange shaped costumes
  - Costume's behavior to motion seen only upon production ( limited opportunities for trials and experimentation)
  - Communication issues between the costume designer and choreographer
- Problems in implementing their ideas ( when same person in small teams, DIY approach)
- Multiple physical trials are required , expensive & time consuming procedure

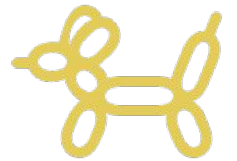
# MAIN RESEARCH OBJECTIVES



Identify existing  
workflows and their  
limitations



Develop Digital Cloth  
Applications



Develop sustainable,  
iterative methods for  
costume development



Enhance collaboration  
models between  
choreographers and  
costume designers



Create visual and  
conceptual stimuli to inspire  
movement and  
choreography

# RESEARCH QUESTIONS

1. How can Digital Costume Applications affect/support costume design? (production oriented)
  - ? help idea implementation
  - ? Various body types
  - ? Multiple trials/ experimentation with various designs
  - ? See response to motion
2. How can Digital Costume Applications affect/support choreography?
  - ? assist with spatial problems
  - ? affect choreographic thinking/decisions
3. How can Digital Costume Applications affect/support dancers' performance?
  - ? How can paradigms like augmented mirrors help with movement understanding/practicing?
  - ? Digital garments as visual/conceptual stimuli

# TECHNOLOGIES & TOOLS

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-Costume design (CLO3D, Marvelous Designer)

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-Cloth simulation (CLO3D, Marvelous Designer, Unreal Engine)

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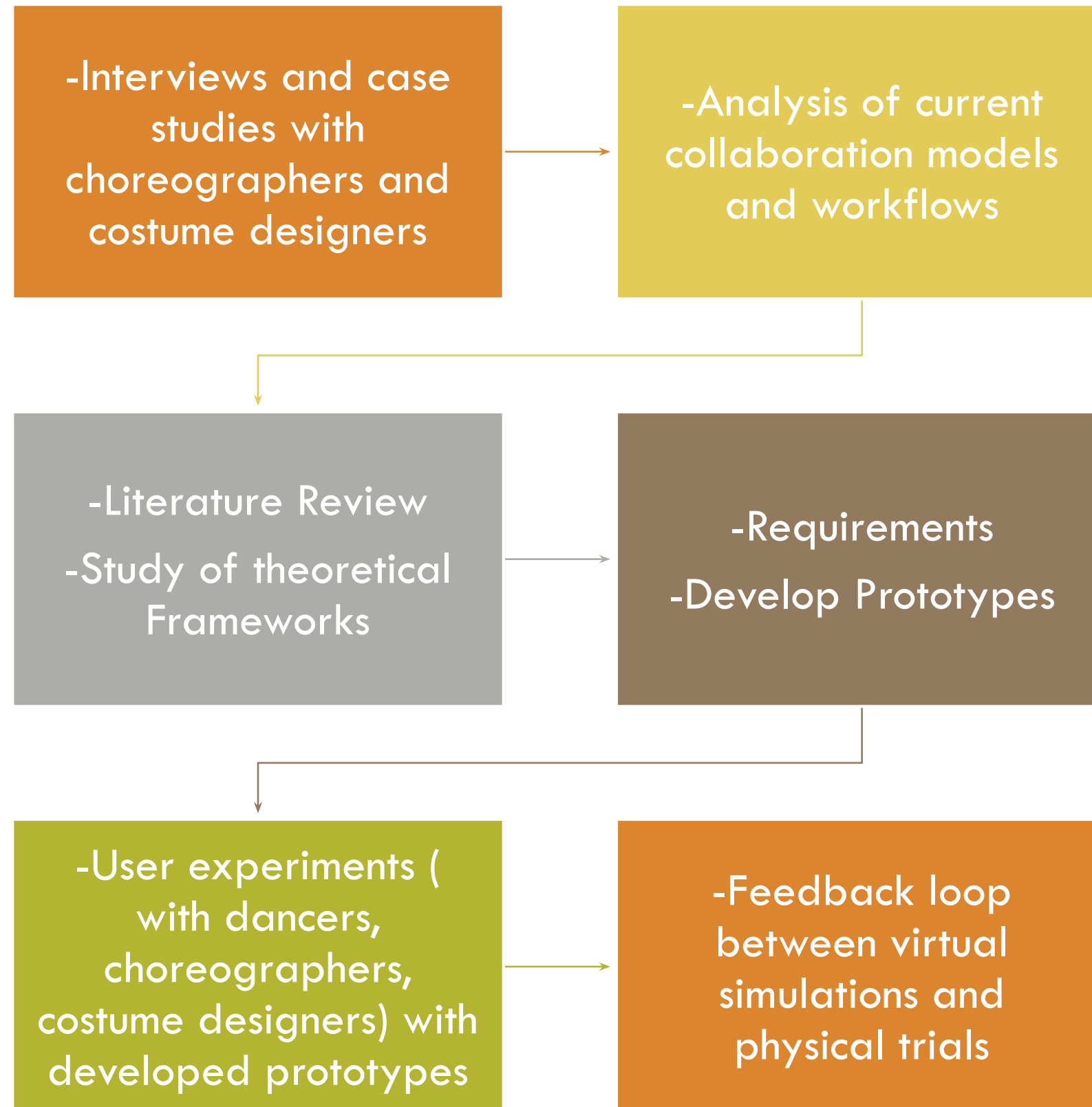
-Motion capture systems and real-time tracking

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-Immersive XR environments

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-3D character modeling



# METHODOLOGY



# PRELIMINARY RESEARCH: VR DANCE LEARNING STUDY

Presented in Moco '22

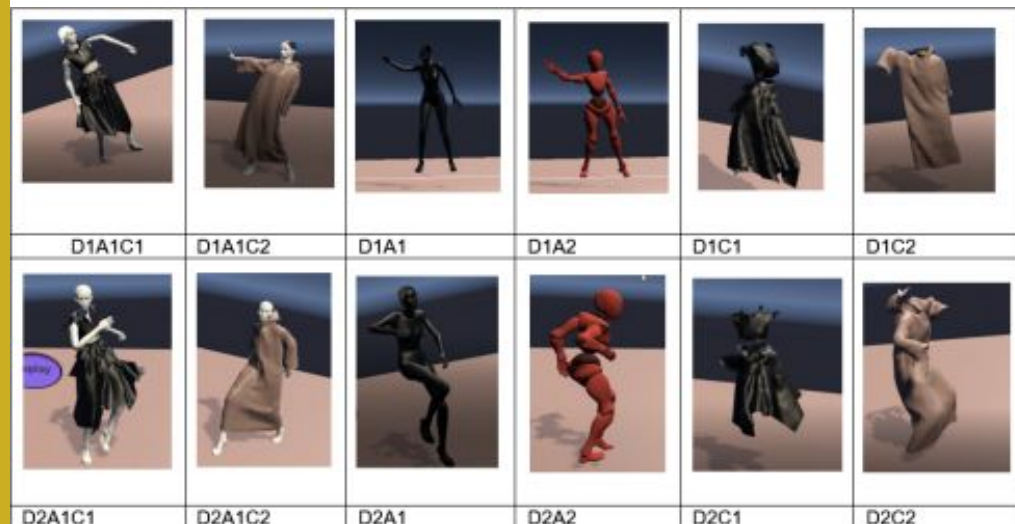
19 participants tested 12 conditions (movement, character, cloth combinations) in VR

They tried to follow the animations by reproducing the moves

Abstract avatars improved clarity and rhythm replication

Flowing costumes reduced accuracy in harder dance routines

Experienced dancers valued animated clothes for expressive qualities



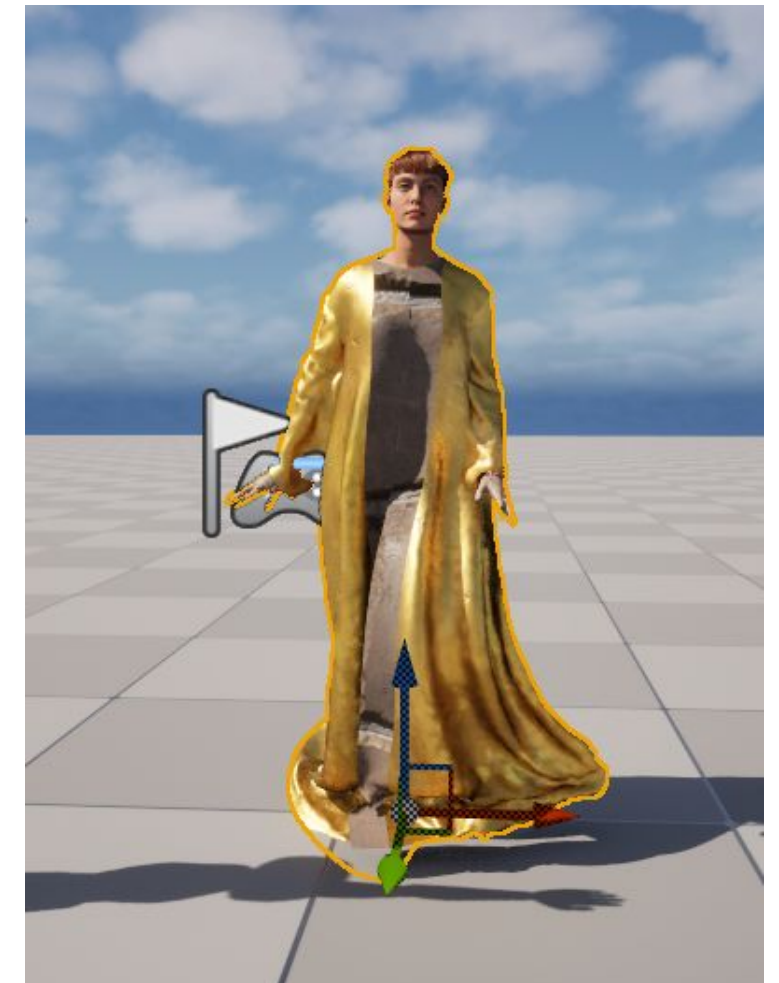


# THE TECHNOLOGY: REAL TIME CLOTH SIMULATION

## Real time cloth simulation inside Unreal Engine

Metahuman + Rokoko+ Unreal Engine

- ❖ Milestone
- ❖ Tested with users in June 2025 during Xarts Summer School



The background image shows a dance studio with several dancers. Two large, dark, cone-shaped skirts are prominently displayed in the foreground, suggesting the theme of the case study. The dancers are in various poses, and the studio has a modern, minimalist aesthetic with large windows and a light-colored floor.

# CASE STUDY: DIGITAL QUEENS

Collaboration with dance studio in Athens, Greece

Cone-shaped long skirts for spinning dance performance

Challenges: space prediction, idea implementation, movement practicing without physical costumes

Test digital prototypes to address our research questions

# IMPACT & APPLICATIONS

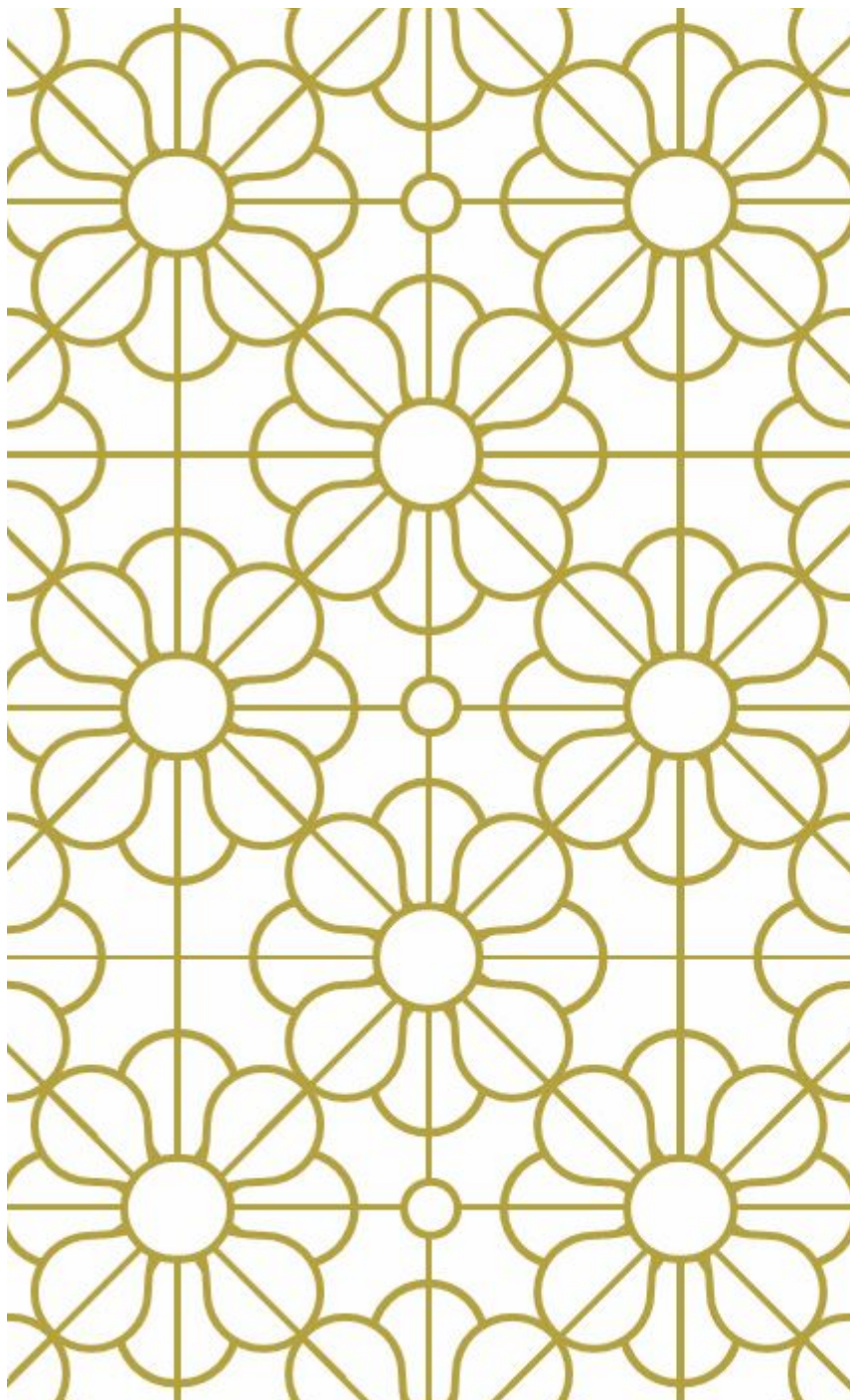
Enhanced creative collaboration between disciplines

Cost-effective prototyping for independent artists and small studios

Educational applications in dance practices

Cultural preservation through digital costume archiving

Innovation in performance technology and digital arts



THANK YOU,  
QUESTIONS?

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