3. METHODOLOGY PROCESS

3.1. COMPLEXITY ANALYSIS SYSTEM DEVELOPMENT

1 3.1.1 3D MODELING

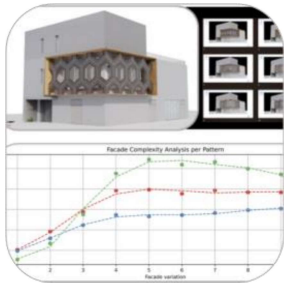
- Create detailed 3D models of the building's exterior and interior using Blender (v3.6).
- Apply 3D modeling operations to generate 10 facade variations with increasing complexity.
- Export models for VR and CICA analysis.

(see Section 3.1.1, Figure 2.)

2 3.1.2 CICA SYSTEM

- Computational Image Complexity Analysis (CICA) system.
- Utilizes CV and MOO algorithms to generate the CICA score.
- Applied in both historical analysis and 3D-modeled facade variations.

(see Section 3.1.2, Fig. 3)



3 3.1.3 VR INTEGRATION

- Integrates 3D models into an immersive VR environment for participant interaction.
- Allows real-time manipulation of facade variations for complexity assessment.
- Developed using Unity

(see Section 3.1.3, Fig 3)

3.2. EXPERIMENT EXECUTION

4 3.2 EXPERIMENT

- Evaluates participants' responses to complex facade variations in VR.
- Includes VR interaction, screen-based ranking, and post-interaction survey.
- Merges qualitative and quantitative data for insights into complex facades.

(see Section 3.2, Fig. 5)

3.3. DATA ANALYSIS AND EVALUATION

5 3.3 DATA ANALYSIS

- Analyzes CICA scores from both historical analysis and experiment data to assess facade complexity.
- Evaluates system accuracy and participant perception.
- Confirms the validity and applicability of the CICA system in design.

(see Section 3.3, Fig 5)