

FACADE MODELING

VIRTUAL SITE

Building and terrain

PATTERNS MODULE

P1

P2

P3

10 FACADE VARIATIONS

P1

P2

P3

Render images as PNG

FACADE VARIATION FOLDERS

Facade's Render Image with variation number and per pattern

HISTORY ANALYSIS

ARCHITECTURAL STYLES

Images of buildings by architectural style.

- ID by year, name
- Organize per Style

Organize in Folders

ARCH. STYLES FOLDERS

Building's Image with year and per style

Export as fbx format

COMPUTATIONAL IMAGE COMPLEXITY ANALYSIS

ARCH. STYLES

FACADE VAR.

INPUT IMAGES

- Load images
- Assign folder name for identification

OUTPUT

- Complexity score based on edge density and contour count
- ID per name and folder

CALCULATE COMPLEXITY

Process Images

- Convert to grayscale
- Apply Gaussian Blur to reduce noise

Metrics

- Calculate Edge density
- Calculate contour count

Complexity Score $f1(x)$

- Normalize metrics
- sum of the product of the metrics times a weight value

Were all images processed?

No

No

Yes

Yes

Ranked facades (1 to 10) per pattern

P1

P2

P3

Buildings per arch style

ID = score_year_style

VR INTEGRATION

- Import 3D models and ranking data.
- Unity compile and Build

Complexity across STYLES

Graph and trendline on complexity score across the years

