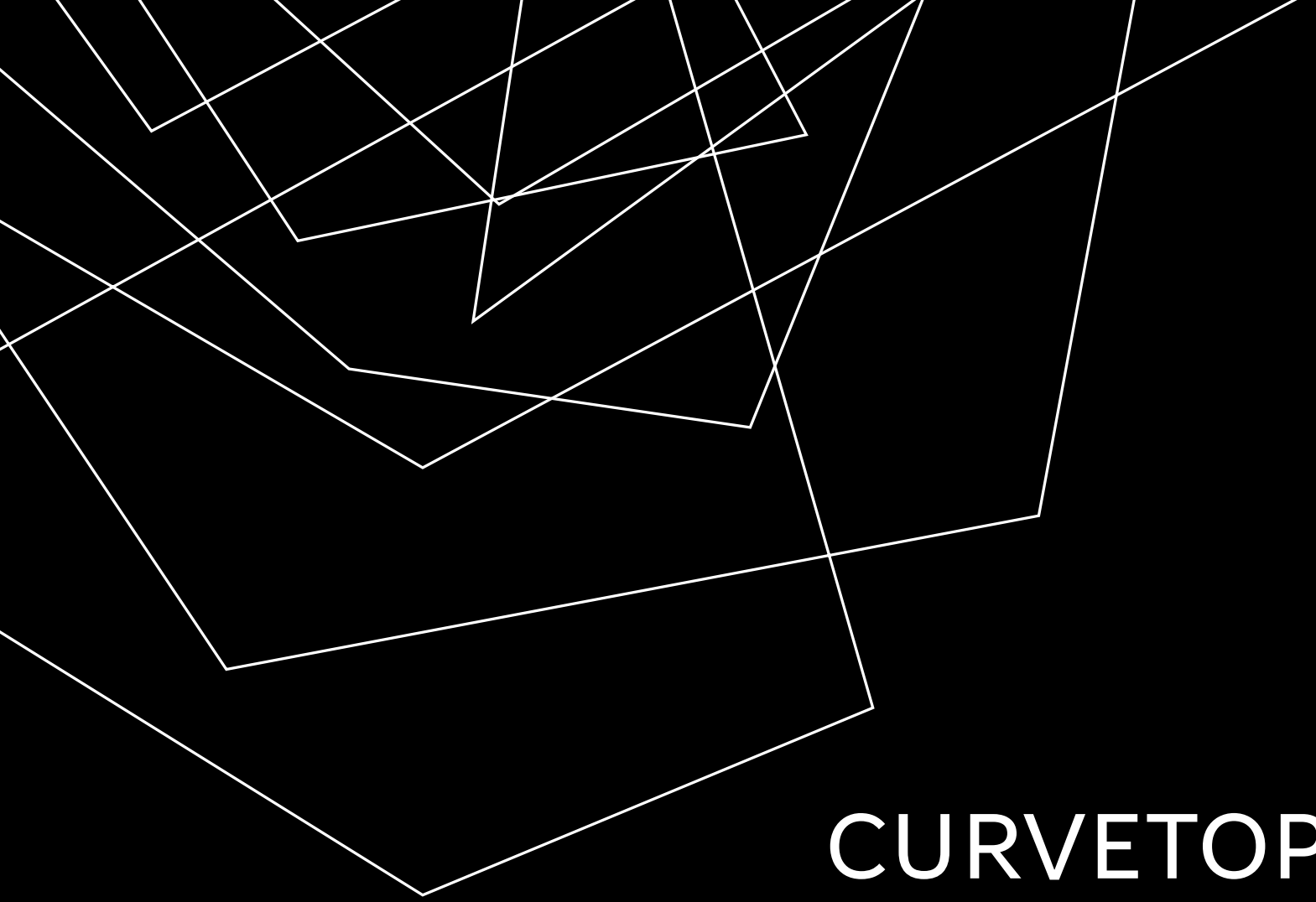
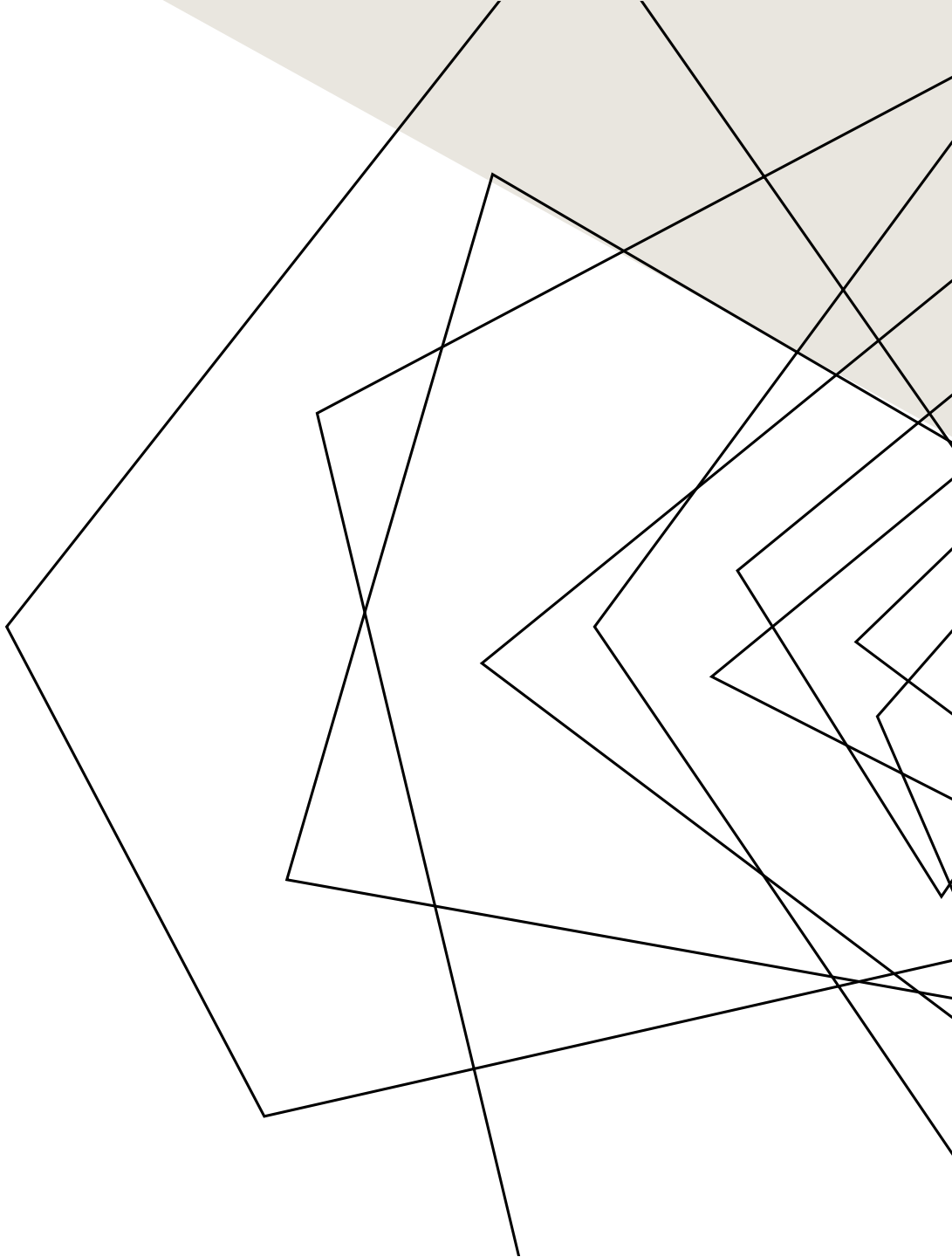


CURVETOPIA: A JOURNEY INTO THE WORLD OF CURVES

ABOUT US

Welcome to Curve Topia, where we delve into the world of 2D curves, focusing on identifying, regularizing, beautifying, and completing curves with a strong emphasis on symmetry and precision.



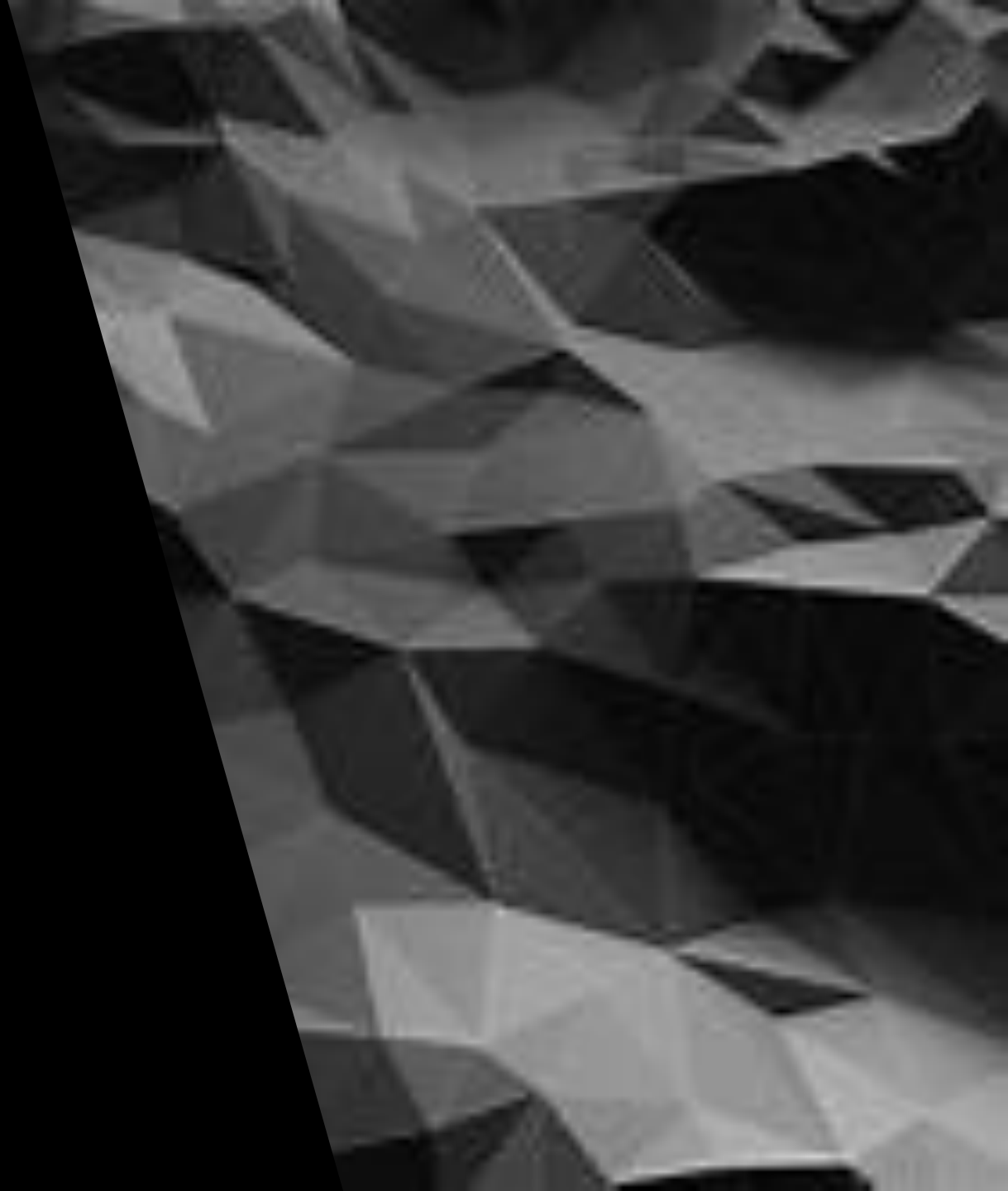
INTRODUCTION:

What is Curve Topia?
Curve Topia is a comprehensive framework designed for the advanced analysis and processing of 2D curves, particularly within SVG (Scalable Vector Graphics) files.

Symmetry Detection: Curvetopia identifies and analyzes the symmetry of shapes, allowing for the detection of symmetric patterns and the visualization of symmetry lines within the shapes.

Shape Regularization: The framework regularizes shapes, refining them to adhere to specific geometric standards. This process involves adjusting the shapes to be more uniform and correcting any irregularities, ensuring that they meet desired specifications for further processing or presentation.

Occlusion Completion: Curvetopia also focuses on the completion of partially occluded shapes. By analyzing the visible contours and edges, the framework reconstructs missing parts of shapes, making it possible to restore or complete images where parts of the shapes are hidden or incomplete.



TOOLS USED:

- Python
- OpenCV
- Shapely
- Streamlit
- svgpathtools.

SHAPE DETECTION:

- **Detecting Shapes in SVGs:**
- **Process:** Convert SVG paths to contours.
- **Shape Categories:** Triangle, Square, Rectangle, Polygon, Circle, Ellipse.
- **Challenges:** Differentiating between similar shapes (e.g., circle vs. ellipse).

SYMMETRY DETECTION

- **Purpose:** Identify and highlight symmetric shapes.
- **Method:** Analyze contours for symmetry by flipping the image horizontally and vertically.
- Draw symmetry lines for identified symmetric shapes.
- **Outcome:** Distinguish between symmetric and asymmetric shapes.

OCCLUSION COMPLETION

- **Objective:** Complete partially occluded shapes in images.
- **Process:**
- Apply edge detection and morphological operations.
- Use contours to identify and fill missing parts of shapes.
- **Result:** Restore the original appearance of occluded shapes.

REGULARIZATION

- **Goal:** Refine and regularize shapes in SVG files.
- **Procedure:**
- Analyze uploaded SVG files.
- Count and display the number of each shape detected.
- Provide a visual representation of the regularized SVG.

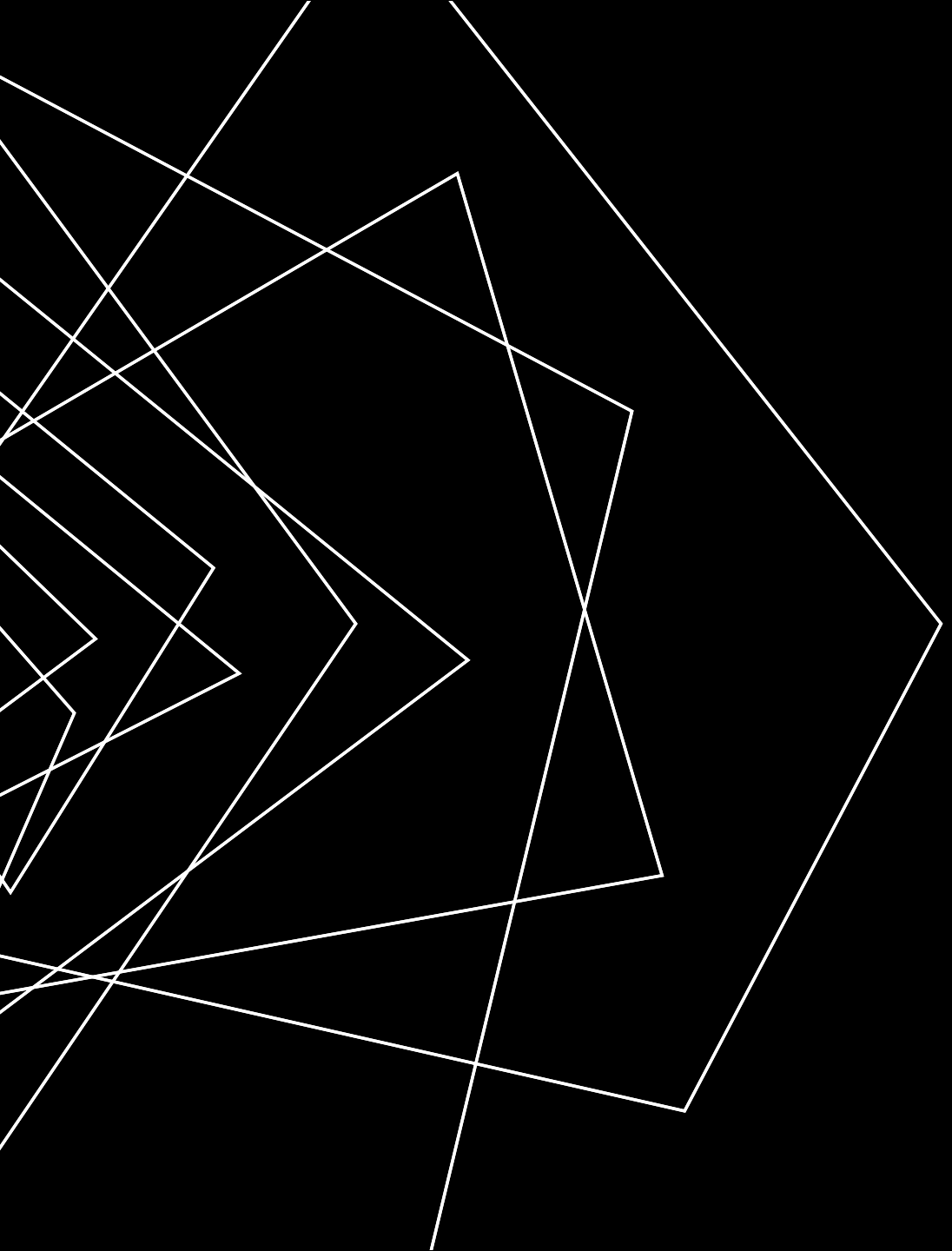
CONCLUSION:

- **Summary:**
- Curve Topia offers a comprehensive solution for SVG shape analysis.
- Key features include shape detection, symmetry detection, and occlusion completion.

Future Work:

Expand the model to handle more complex shapes and patterns.

Improve the accuracy of shape detection algorithms.



THANK YOU

BY

GADE.OMKARREDDY
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