SKETCH BASED ANIMATION SYSTEM

COMPUTER GRAPHICS PROJECT

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INTRODUCTION

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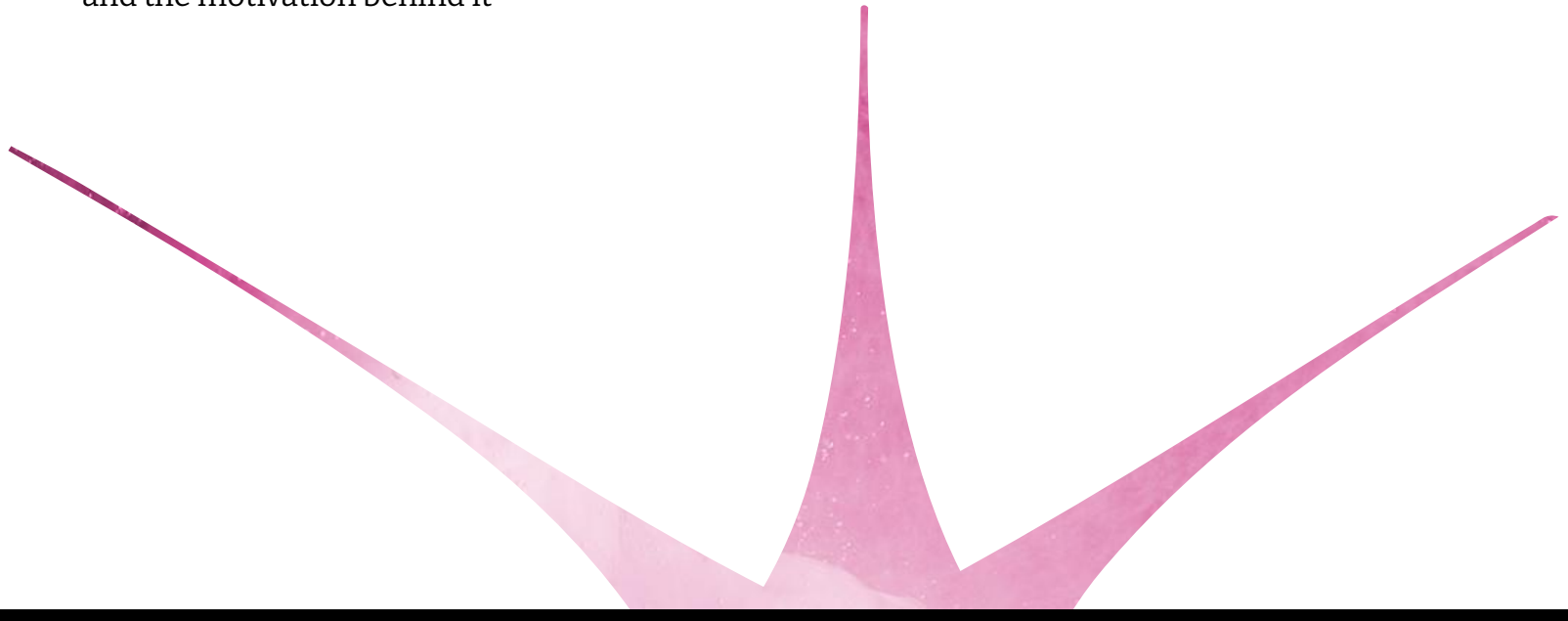
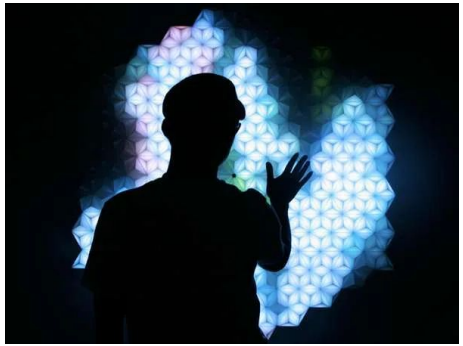
An introduction to our problem statement
and the motivation behind it



Introduction & Motivation

In the realm of computer graphics, the convergence of artistry and technology continues to drive innovation. Our project, "Sketching Dynamic and Interactive Illustrations," emerges from the desire to transcend static imagery, introducing a platform that empowers creators to animate and interact with their visual narratives. Inspired by pioneering works like "Kitty," our aim is to harness the potential of sketch-based animation systems, offering a versatile canvas where artists and designers can seamlessly craft, animate, and engage with dynamic illustrations. This pursuit stems from a passion to augment artistic expression with digital tools, exploring new dimensions in visual storytelling while embracing the evolving landscape of creative possibilities.



LITERATURE REVIEW

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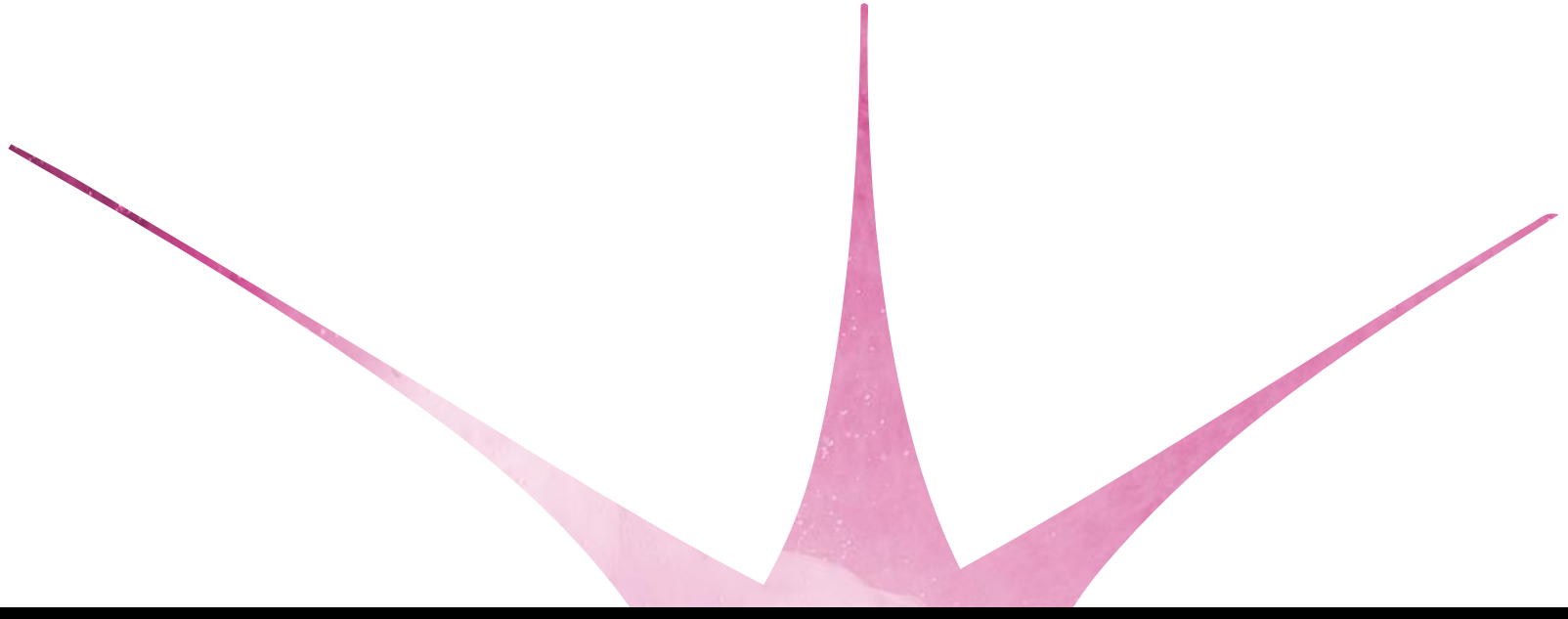
An overview of the previous literature



Literature Review

Sketch-Based Animation: Literature Insights

"Kitty" by Kazi et al. [1]: Showcases interactive ink-based drawing, inspiring our aim to enable user-driven sketching and animation.

"Animation Sketching" by Moscovich [3]: Offers insights into accessible animation techniques, informing our project's user-friendly approach.

"Draco" [2]: Introduces kinetic textures, inspiring dynamic elements within static illustrations.

Our project aims to amalgamate these influences, empowering users to seamlessly sketch, animate, and interact with dynamic illustrations through enhanced features like brushes, drag-and-drop, and layered creation.

MILESTONES

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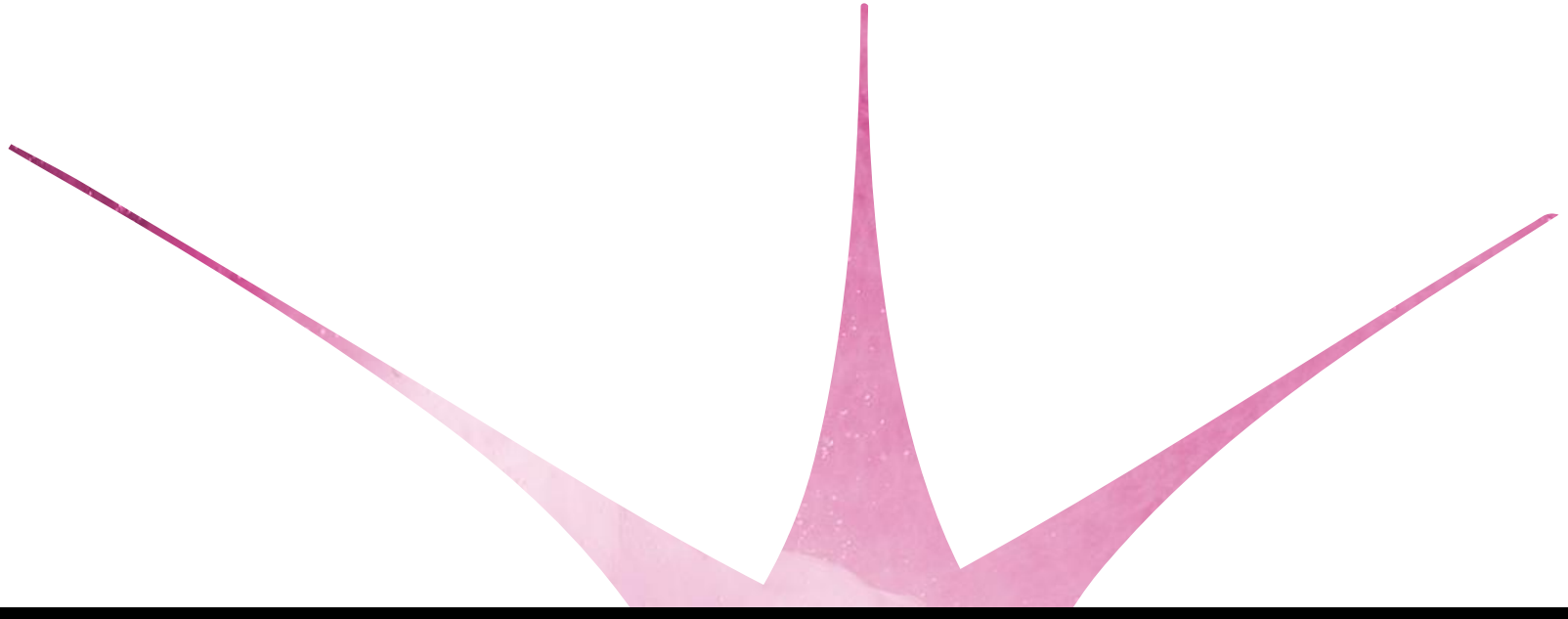
Work Division and milestones set



Milestones

S. No.	Milestone	Member
	Mid evaluation	
1	Sketching and conversion to discrete objects (brush strokes to entity definition)	Harsh
2	Layered object manipulation (Drag, Drop and Delete for existing entities)	Pranay
3	Rigid Body Animation with local timeline implementation	Harsh
4	Defining and Implementing Kinetic Textures (Emitting, Oscillating and Granular)	Pranay
	Final evaluation	
5	Relational Graph Structure Implementation (Initial setup and parameter definition)	Harsh
6	Relational Graph Structure Implementation (Shortest Paths and Transitive Relations)	Pranay
7	Time Control Presets for the animation timeline	Harsh
8	Chain Effects Implementation	Pranay
9	Importing existing images *[Tentative]*	
10	Export Logic *[Tentative]*	

APPROACH & CHALLENGES

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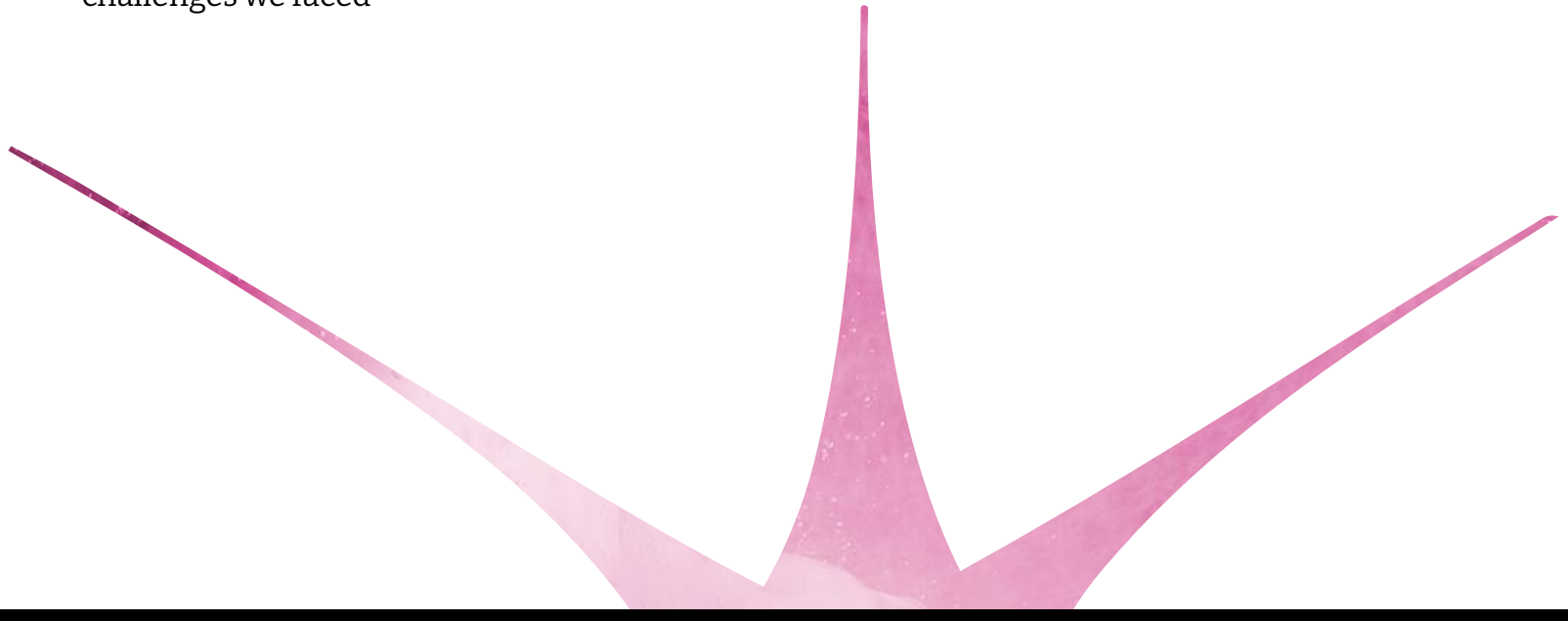
The approach we followed and the challenges we faced



Approach

Sketch Implementation & Functionality

- Sketch Algorithm: Allows continuous sketch creation by tracking mouse points, avoiding duplicates, and enabling sketch viewing when not in edit mode.
- Illustration Management: Simple manager enabling addition, deletion, and editing of chosen drawings.
- Sketch Editing: Offers functionalities to move, rotate, and scale images using a 2D homogeneous transformation matrix.
- Animating Sketches: Each illustration has an animation manager enabling frame interpolation, playback control, and multiple spirits for an object.
- Kinetic Textures (Emitting): Divided into emitting surface, direction, particles, and mask, allowing multiple textures within a scene.
- Relational Graph Structure: Nodes represent various sketches (static, kinetic textures), allowing connections via edges (linear/square/cubic/exponential relations).
- Time Control Presets: Enables animation control between nodes, setting relationships in runtime durations (supports linear and can extend to other relations).
- Chain Effects: Not yet implemented but envisioned to catalyze nodes within a proper relational graph, creating chain reactions through recursion.

Challenges faced

Color Uniformity: Maintained a single global color for sketches, slated for enhancement in future iterations to allow diverse coloring per sketch.

Graph Recursion & Multi-Animation Application: Encountered hurdles while implementing graph recursion and extending graph application to manage multiple animations per object, aimed for future implementation and optimization.

Rotation Technique: Opted for primitive rotation over quaternions, acknowledging the potential for adopting quaternions to improve rotation precision and mitigate artifacts.

Interactive Interface: The current implementation leans on a toolbox for manipulations rather than direct interactions, an area earmarked for refinement to achieve a more interactive design, aligning with initial project goals.

RESULTS

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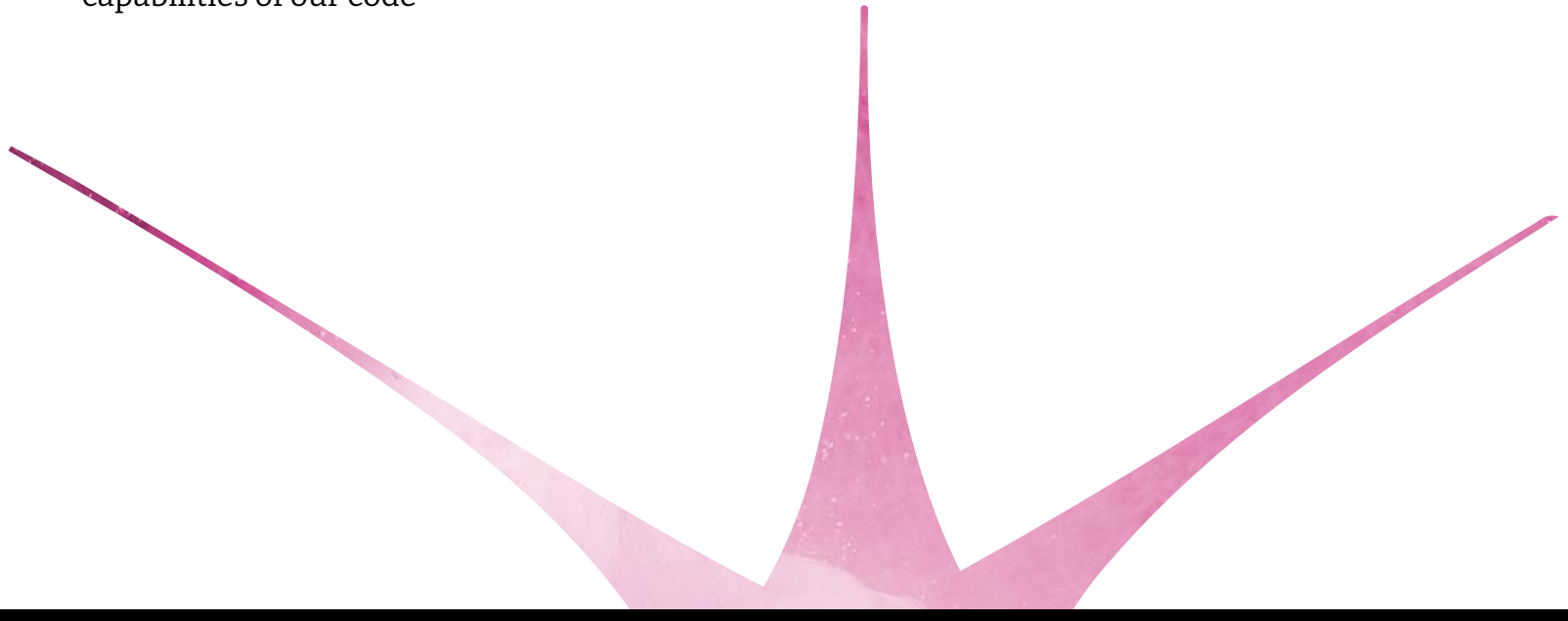
The results give us glance on the capabilities of our code



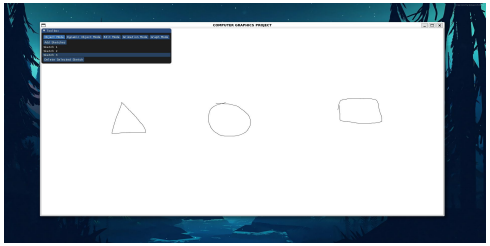
Results

Project Highlights

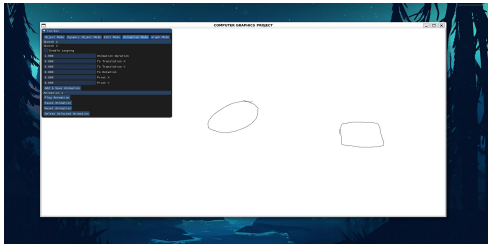
- Interactive Sketch Creation: Streamlined sketch creation with an algorithm ensuring smooth point addition, optimizing user interaction.
- Illustration Management: Implemented an intuitive manager for easy addition, deletion, and editing of drawings, enhancing workflow efficiency.
- Sketch Manipulation: Enabled image movement, rotation, and scaling via a 2D transformation matrix, enhancing creative flexibility.
- Animation Control: Managed animations efficiently, allowing smooth frame interpolation and user-friendly playback controls.
- Kinetic Textures: Integrated emitting textures, enabling dynamic particle system creation within scenes.
- Graph Structure: Developed a comprehensive graph for establishing relationships between sketches and animations.
- Temporal Coordination: Enabled synchronization between animations, offering temporal control presets for enhanced coordination.
- Future Chain Effects: Laid groundwork for potential future chain reactions between nodes for complex interactions.

Project goals

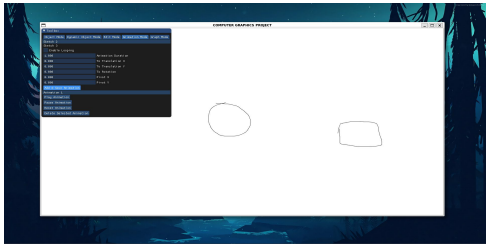
Adding sketches



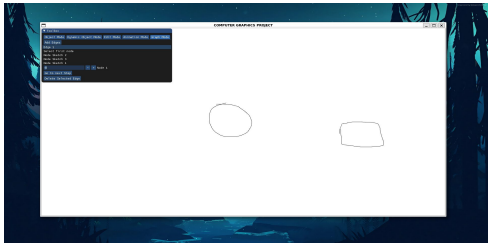
Animating sketches



Editing and removing sketches



Adding relations between sketches



Sneak peek

Recreating a scene where turning the gas stove knob boils water rapidly

CONCLUSION

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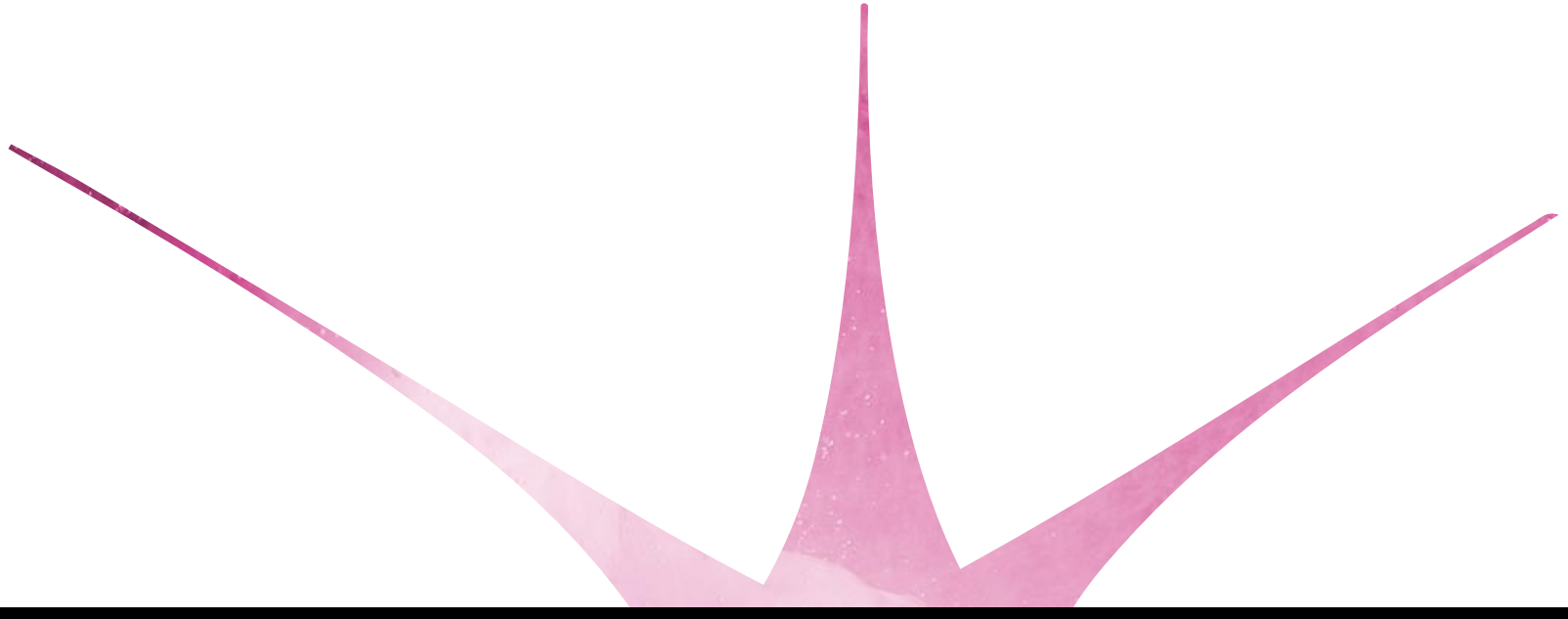
Concluding our work



CONCLUSION

Convergence of Art and Tech

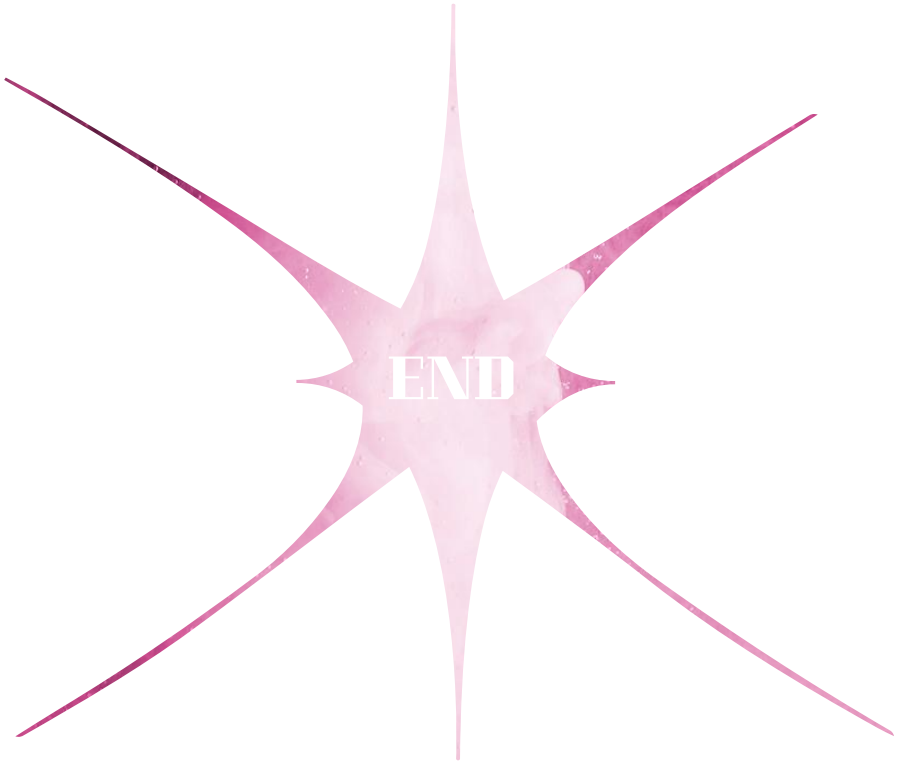
Fusion of "Kitty" inspiration with sketch animation research resulted in a dynamic canvas for seamless sketching, animating, and interaction.

Navigating Challenges for Growth

Overcoming obstacles like global color schemes and recursion complexities provided invaluable learning experiences, guiding future improvements.

Potential Unveiled

Despite challenges, achieved seamless sketch manipulation, interactive connections, and orchestrated animations, hinting at vast possibilities for future enhancements.



THANK YOU