

# 4-comma: Recursive Fractals and Firefly

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Fig. 1. This is my 4-comma, where a scientist character is trying to photograph a rare bird with his knowledge and application of recursive fractals in nature which he applied to a camouflage outfit. He waits for 7 hours and is irritated that it didn't work, but unbeknownst to him, the rare bird has decided to use his hat as a perch.

Additional Key Words and Phrases: AI generative art, Adobe Firefly, Adobe Photoshop, hybrid creative pipeline, creative exploration, AI-assisted iterations, digital workflow, artistic control, image refinement

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**1 Abstract**

Through an integrated workflow combining digital drawing techniques in Photoshop with strategic elements generated through Adobe Firefly's AI, I developed a hybrid creative pipeline that maintains artistic control while leveraging AI-assisted iterations to enhance my comic's visual narrative. This creates a universal methodology that is adaptable to diverse artistic approaches.

**2 Introduction and Related Works**

My interest in AI generative art as a creative tool has developed over the course of my college education due to its quick evolution and endless opportunities to supplement artistic exploration. I intend to use AI generations to supplement my design so I can evaluate artistic options and make critical decisions more efficiently. Multiple studies have looked at "how creative AI tools such as image generative AI tools can be applied in various creative stages" (Huang). Manga is an effective medium to highlight this process due to its simplistic base, and versatility to various artistic styles. I believe Adobe Firefly and Photoshop work as effective mediums due to their easy user interface, diverse tool sets, and accessibility. "Creatively oriented artificial intelligence (AI)... are subject to continuous improvement..." however there are common limitations such textual generation, logical discrepancies, and lack of uniqueness (Angelova). There are countless available graphics editors like Photoshop and both closed-sourced and open-sourced AI models to explore this method of creative exploration. For example, "While closed-source Gen AI models still exhibit superior performance compared to their open-source counterparts...this gap is steadily narrowing" (Chun et al). Understanding your needs and the available options of the current market will help you find the best programs to use.

**3 Methodology**

The creative process begins with planning your composition in Photoshop, where you'll design and layout the content for each individual cell. An alternative approach is to hand-draw your content on paper and digitize it through scanning, allowing for digital refinement afterward. Once your initial design is complete, upload it to Adobe Firefly using the reference option for composition. This powerful AI tool enables you to generate multiple variations of your artwork, exploring countless different creative directions [Figure 2]. The generation process can vary in duration based on your specific requirements, the complexity, and the fine tuning of your settings. Use the generated images to update your artwork back in your editing software. You can iterate through the process multiple times to achieve consistent styling and maintain visual harmony. While Photoshop is commonly used for this workflow, other digital art software can also be employed for the initial creation and manipulation phases. Through repeated experimentation with Firefly's controls, you'll develop a deeper understanding of how to achieve your desired artistic style. This iterative process ensures that all cells maintain stylistic cohesion while allowing for creative evolution. The combination of traditional techniques and AI-assisted generation provides flexibility in achieving your artistic vision.



Fig. 2. Image generations from Adobe Firefly. The prompt I used was "a man in glasses in a camouflage suit hiding in the bushes with a camera and binoculars", for cell 1 and "a bird with red feathers, big eyes and a big beak with a plume like a crown" for the bird in Cell 4. **[Red]** Initial attempts for cell 1 generations did not show much difference from straight generations without reference. Even generating with the distinction of 'art' instead of 'photo' produces near-realistic images. **[Yellow]** Stylistic exploration: Art, Simple, Fauvism, Modern Art, Comic Book, Digital art (Increased Impact of my Composition reference based on sketches: results in more abstracted images and patterns.) **[Green]** Stylistic exploration: Art, Simple, Fauvism, Modern Art, Comic Book, Digital art (**medium impact of Composition reference, see step 1 of Fig. 4.**) **[Blue]** Stylistic exploration: Same filters utilized as the Green group only using the secondary prompt.

#### 4 Result and Future Work

I created a hand-drawn piece that matched my artistic vision yet explored more artistic avenues within a reduced time limit, allowing for more development. Outside of shifting to grayscale, the outcome matched my initial ideas. The process helped create a detailed environment, eliminate unnecessary elements, and the appeal of the characters. Firefly proved valuable for creative exploration, though I'd dedicate more time with manipulating the controls. The process showed me that investigating different approaches is crucial for artistic development. I plan to continue using Firefly for future projects, focusing on thorough exploration of its features to enhance my work.



Fig. 3. Here is the creative progression for the bird character featured in cell 04 from the initial sketch to the finished image [Step 4 and 5 cropped for viewing convenience].

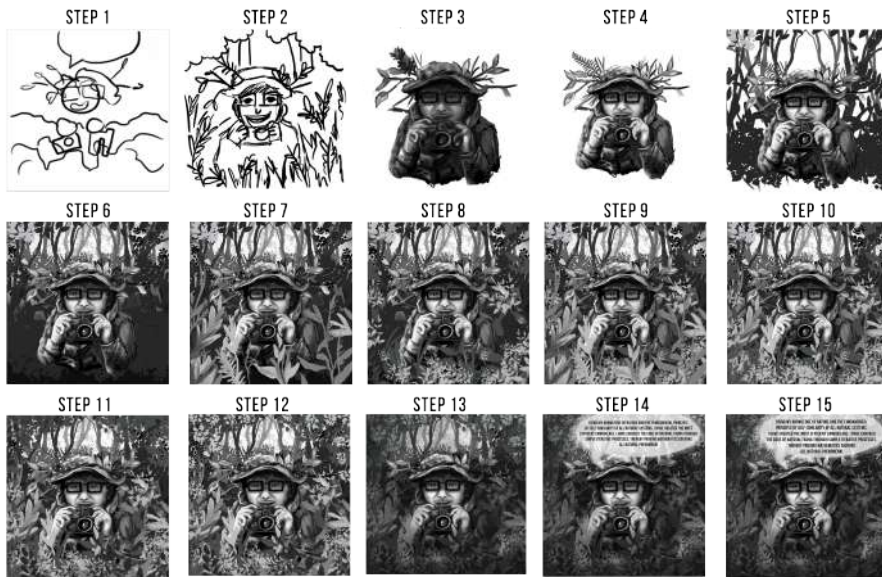


Fig. 4. Here is the progression for cell 1 including initial sketching, character development, environmental detailing, and text implementation. Note that the other three cells were alterations of this cell.

## 5 Conclusion

This method of integrating artistic practices with AI assistance has shown that automation has the potential to enhance rather than replace creativity. The iterative process between Photoshop and Firefly, and other similar programs, demonstrates how AI can spark new possibilities and accelerate creative decision-making while maintaining artistic integrity.

## 6 Bibliography

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VIZA 626 Class Website: <https://sites.google.com/view/viza626/>