

# **Generative Art with Diffusion, Flow Field, Perlin Noise**

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Cmpe 49G Project 3

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# 1 Introduction

## 1.1 Generative Art and Perlin Noise

Generative art refers to any art practice where the artist creates a process, such as a set of natural language rules, a computer program, a machine, or other procedural invention, which is then set into motion with some degree of autonomy contributing to or resulting in a completed work of art [1]. We are going to simulate some kind of diffusion here actually, we will put a number of colorful particles on to the some white or any desired colored page, and these particles will be affected from flow field that is generated by perlin noise, and as the particles move around we they will paint the page and we will have generative art. It is important to use perlin noise while creating flow field instead of solely randomness. Because `random()` will generate a number with uniform distribution in a given range, so each call would be independent. Naturally number sequence is chaotic when the difference between consecutive numbers are big which is case for random selection. On the other side, perlin noise creates a smooth more natural number pattern because each number has dependency between previous ones, this is very helpful for generating the flow field making particles to move in a meaningful way.

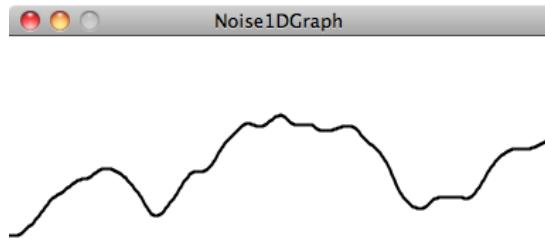


Figure 1: Perlin

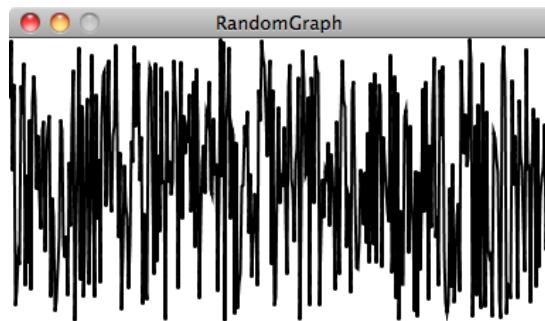
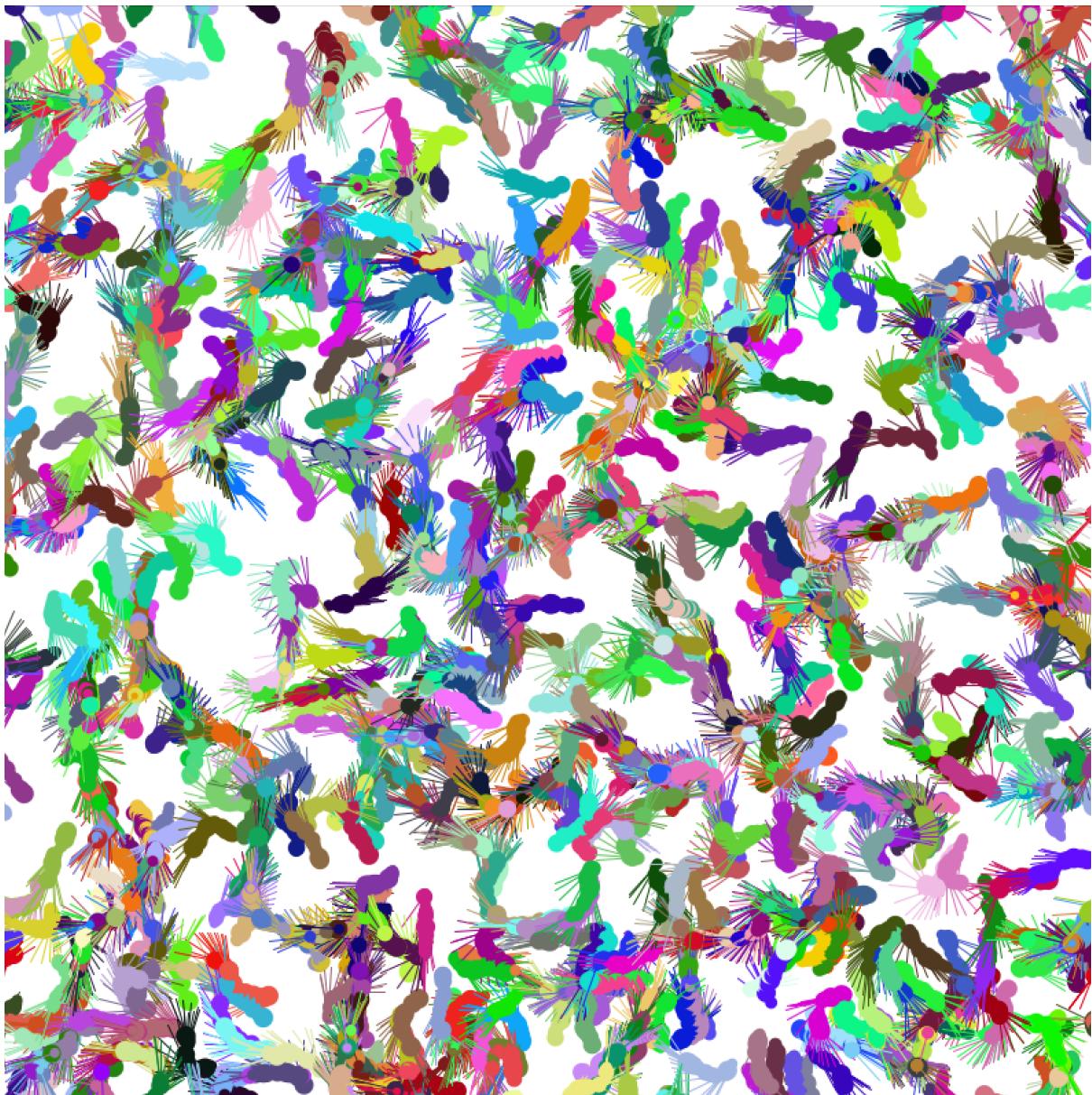


Figure 2: Random

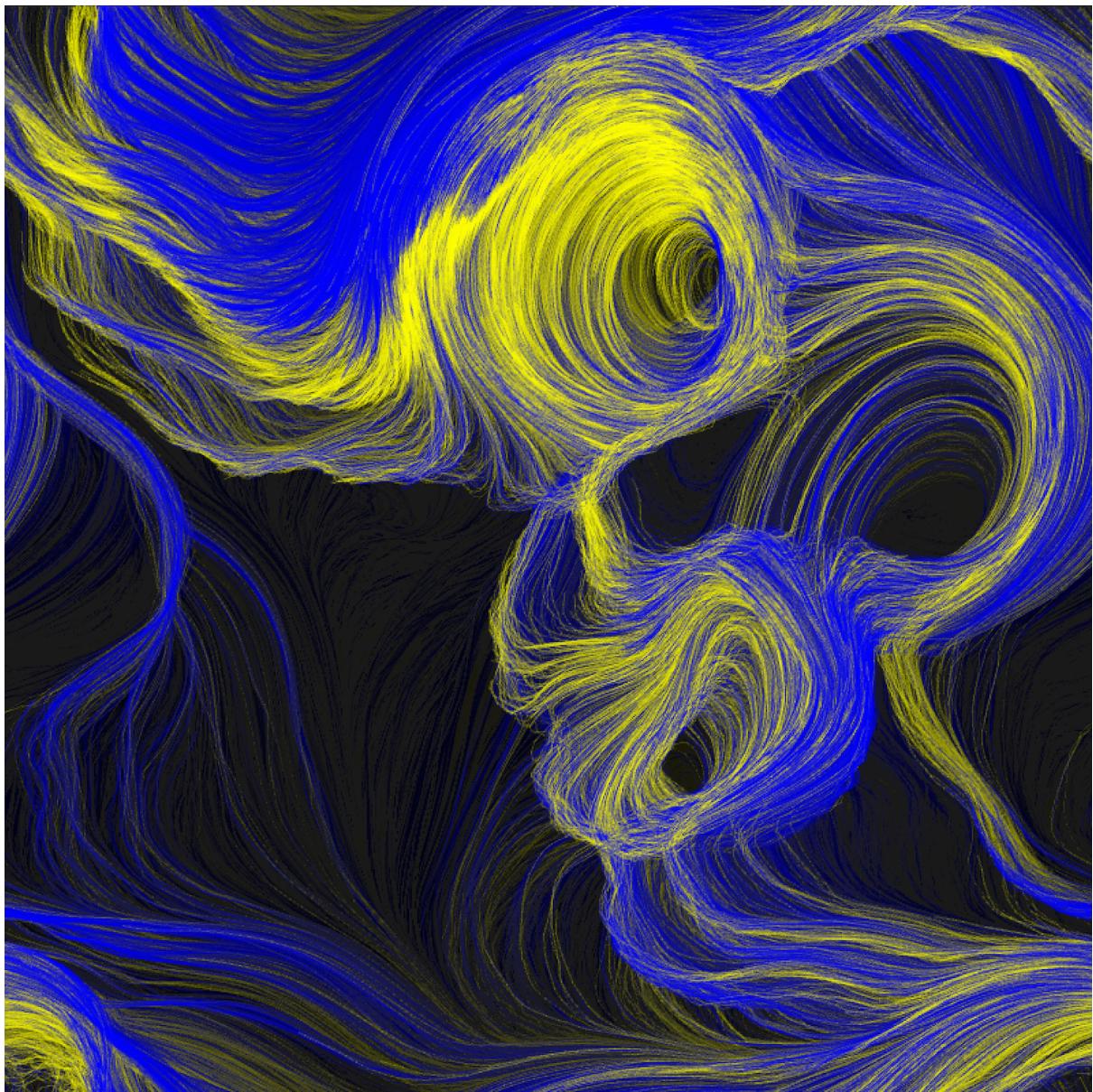
# 2 Portfolio

## 2.1 Art Piece 1: Buffon's Dream



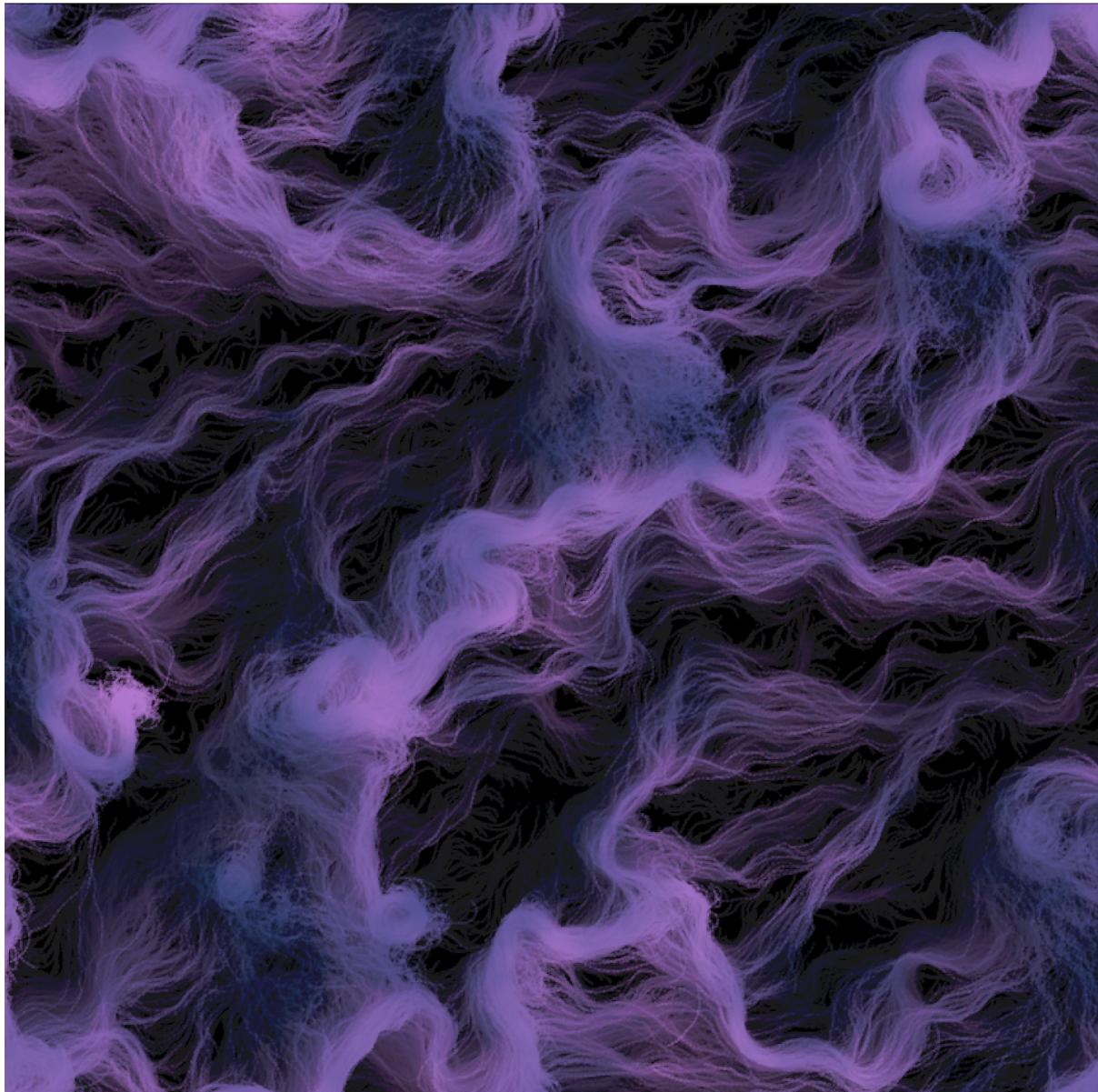
**Story:** Georges-Louis Leclerc, Comte de Buffon, a French naturalist and mathematician, envisioned a dream while working on his famous needle problem.

## 2.2 Art Piece 2: The Fenerbahce Tornado



**Captivating Essence:** This artwork portrays Fenerbahce's success like a mighty tornado, symbolizing the unmatched greatness of Turkey's best sports club.

### 2.3 Art Piece 3: A Symphony of Sweet Poisoning



**Story:** Sweet addiction insidiously poisons the body, exploring the delicate interplay between allure and toxicity.

## 2.4 Art Piece 4: Rainy Last Dinner



**Story:** Last Dinner but rainy.

## References

- [1] Wikipedia. *Generative art*. 2023. URL: [https://en.wikipedia.org/wiki/Generative\\_art](https://en.wikipedia.org/wiki/Generative_art).