

A Collaborative Filtering Based Movie Recommendation System

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$$K_{\text{diamond}} = \begin{bmatrix} 0 & 0.25 & 0 \\ 0.25 & 0 & 0.25 \\ 0 & 0.25 & 0 \end{bmatrix}$$

$$K_{\text{diag}} = \begin{bmatrix} 0.38 & 0.04 & 0.04 \\ 0.04 & 0 & 0.04 \\ 0.04 & 0.04 & 0.38 \end{bmatrix}$$

Figure 1: Kernels used for diffusion.



(a) Diamond kernel K_{diamond}



(b) Directional kernel K_{θ} for $\theta = 100^\circ$.

Abstract—This is the abstract

I. INTRODUCTION

Here is the introduction.

II. METHODS

Hello I am figures and algorithms

Input: Image I , mask M , kernel K and threshold ϵ

Result: Reconstructed image I_r

$K \leftarrow \frac{K}{\sum_i \sum_j K_{i,j}}$ (normalize K to preserve energy);

$I_{prev} \leftarrow 0_{\text{size}(I)}$;

$I_r \leftarrow I$;

while $\|I_r - I_{prev}\|_F > \epsilon$ **do**

$I_{prev} \leftarrow I_r$;

$I_r \leftarrow \text{convolve}(I_r, K)$;

$I_r \leftarrow I_r \circ \mathbf{1}_{M=0} + I \circ \mathbf{1}_{M \neq 0}$;

end

Algorithm 1: Diffusion algorithm for inpainting. We denote element-wise multiplication with the \circ operator. The $\mathbf{1}_{M=0}$ function represents a matrix with elements (i, j) set to 1 when $M_{i,j} = 0$ and 0 otherwise.

1) *Constructing a directional kernel:* I am a subsubsection

2) *Per-patch diffusion using K_{θ} :* I am another subsubsection.

Figure 2: Step-by-step illustration of the diffusion process with different kernels. Each step represent 20 iterations.

| Algorithm | MSE | Runtime |
|--|------------------------------|-----------------------|
| Directional Diffusion (16×16) | 0.00055 \pm 0.00051 | 8.7 \pm 2.13 |
| Directional Diffusion (32×32) | 0.00057 \pm 0.00053 | 2.4 \pm 0.04 |
| Diffusion (K_{diamond}) | 0.00061 \pm 0.00057 | 0.5 \pm 0.06 |
| Sparse-coding (DCT) | 0.0015 \pm 0.0012 | 12.8 \pm 4.67 |
| Sparse-coding (Haar wavelet) | 0.0024 \pm 0.0021 | 13.0 \pm 3.72 |
| Singular Value Decomposition | 0.0019 \pm 0.0018 | 0.7 \pm 0.09 |

Table I: Mean squared error and runtime (in seconds) across different algorithms for the text mask. The best result is highlighted in bold.

III. RESULTS

This is results.

Example of list:

- 1) Sparse-coding with a DCT dictionary [?].
- 2) Sparse-coding with a Haar wavelet [?].
- 3) Singular Value Decomposition [?].
- 4) Regular diffusion with a K_{diamond} kernel.
- 5) Directional diffusion with patches of size 16×16 .
- 6) Directional diffusion with patches of size 32×32 .

blablabla:

$$\text{MSE}(I, I^{\text{rec}}) = \frac{1}{512 \cdot 512} \sum_{i,j} (I_{i,j} - I_{i,j}^{\text{rec}})^2$$

Hello I am a table

IV. DISCUSSION

why?

because sky is high!

V. CONCLUSION

U are close