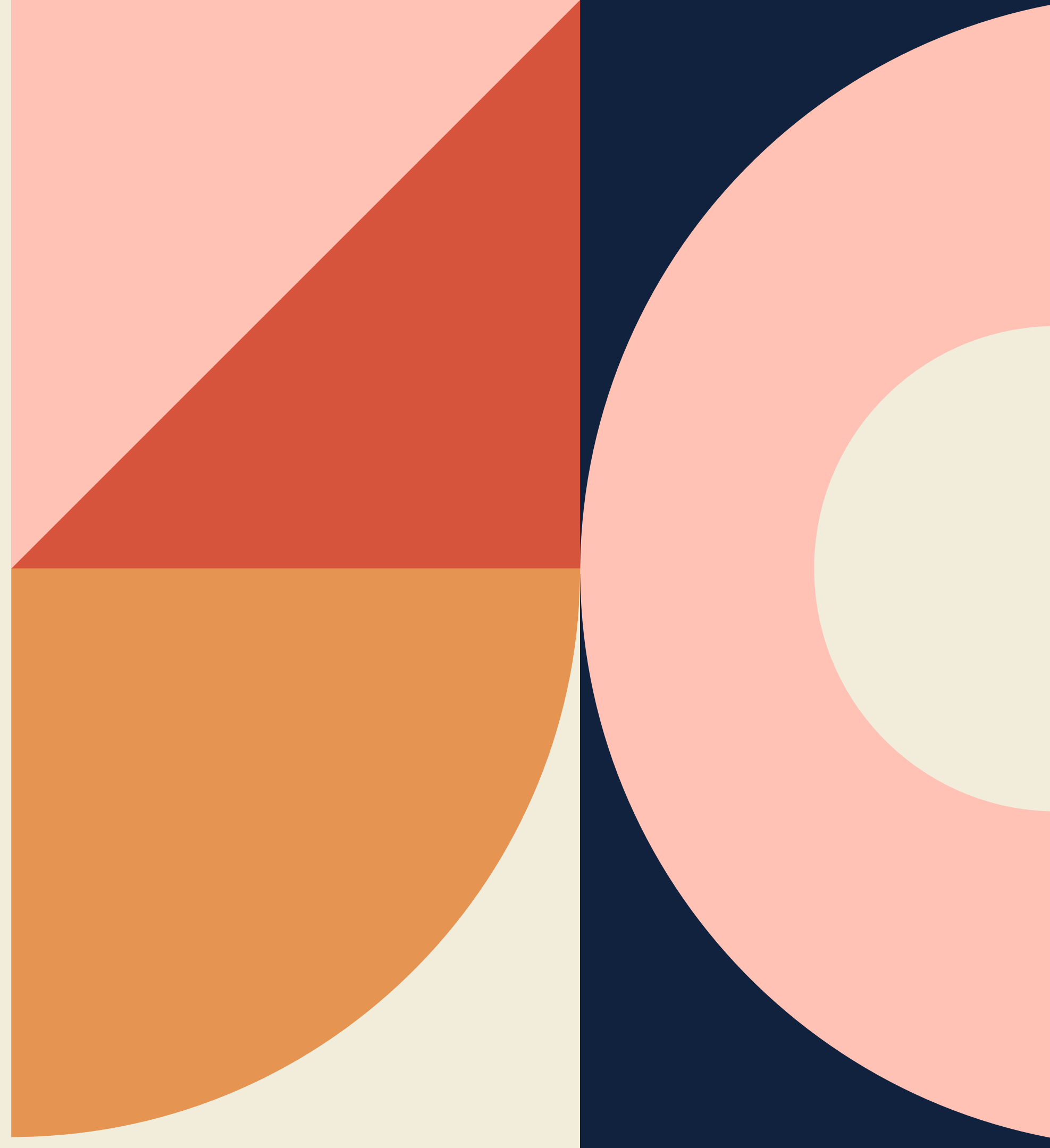# VISUAL LEARNING AND HAND SIGNS RECOGNITION

Maxence Cabiddu - SFSU

Summary

01

INTRODUCTION

GOALS

METHODOLOGY

A knn algorithm for high dimensionalities
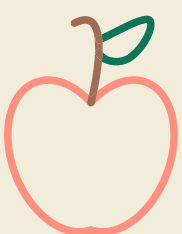
- ☑ Find a dataset
- ☑ Use a simple knn algorithm
- ☑ Create high dim. algorithm
  - ☑ Backward map
  - ☑ Forward map
  - ☑ Binary search
  - ☑ Combine all together
  - ☑ Is it fast ?
- ☑ Compare it with others algorithm

04

The algorithm

Fast nearest neighbor

LABEL, PIXEL1, PIXEL2, PIXELN

0,   200,   125,   8

1,   110,   225,   55

Y	POINT_SET
0	200,125,8
1	110,225,55

ORDERED_SET

110,125,8
200,225,55

BMAP

1
0

FMAP

1,0,0
0,0,0

EXEMPLE:

I = 0
J = 0

O[I][F[I][J]] = P[I][J]   P[I][B[I][J]] = O[I][J]
O[0][F[0][0]]   P[0][B[0][0]]

O[0][1] = 200   P[0][1] = 110
P[0][0] = 200   O[0][0] = 110
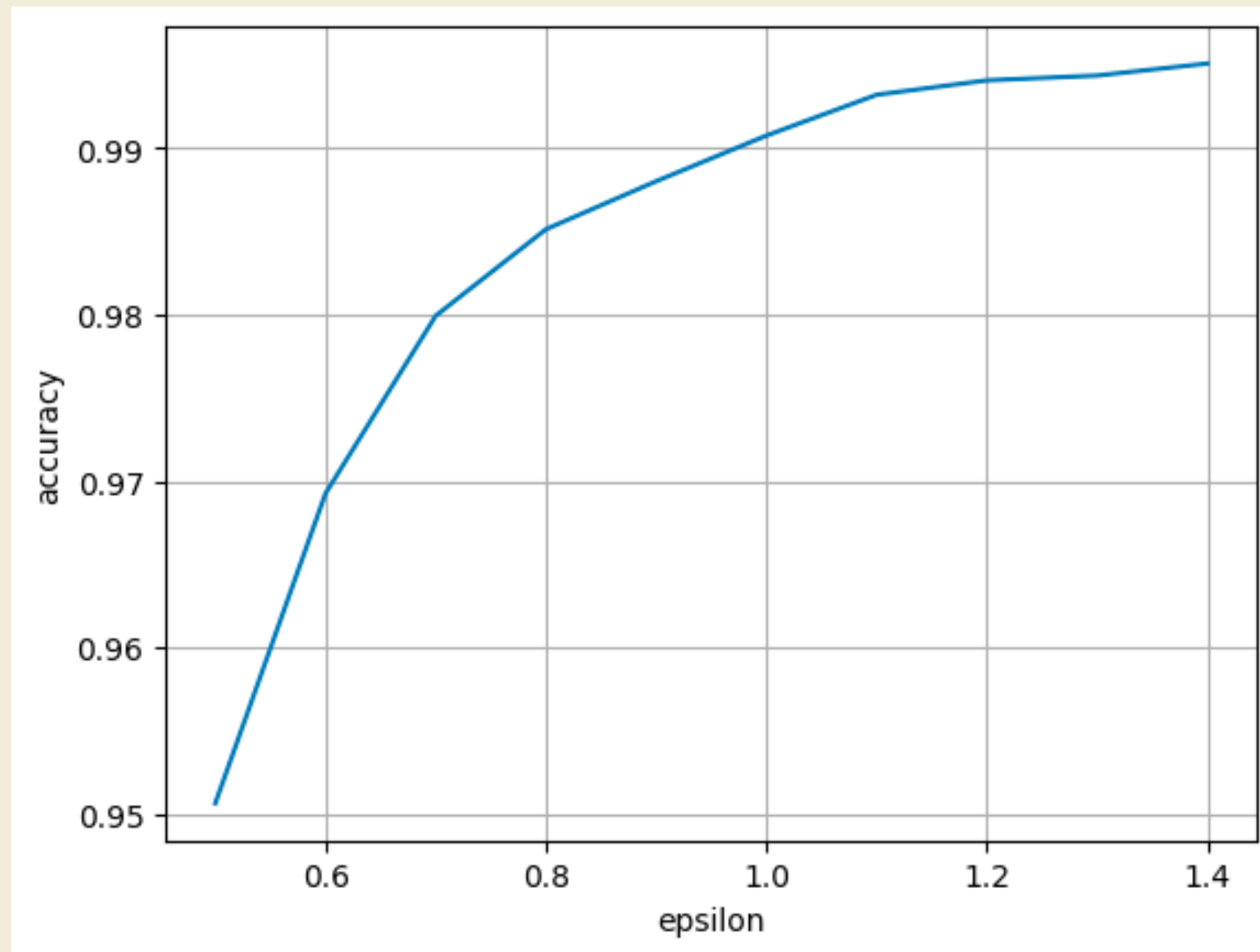
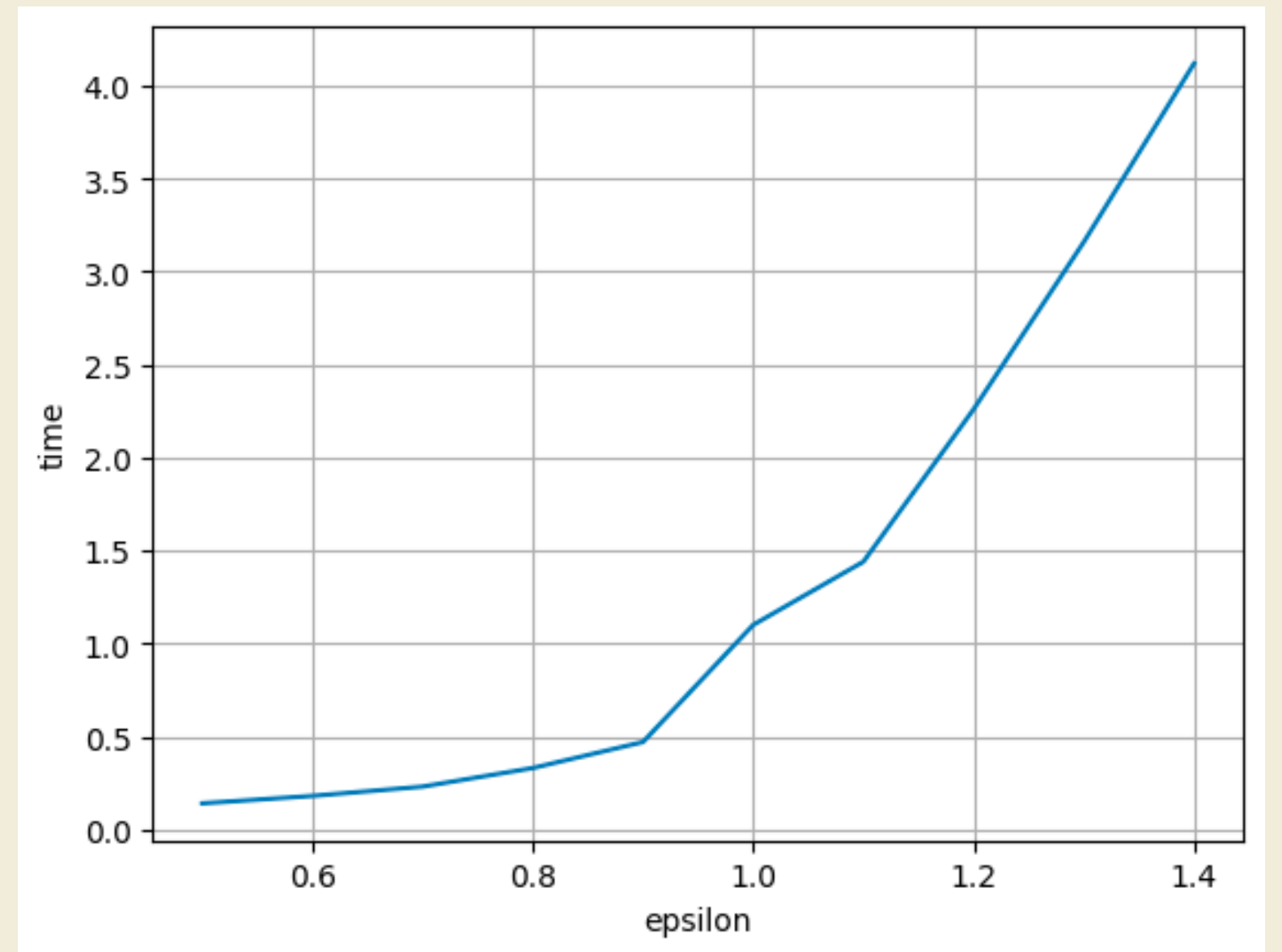O[0][1] = P[0][0]   P[0][1] = O[0][0]

05

RESULTS

Accuracy for dataset of 27701 train rows and 6926 test rows is more than 99% with epsilon = 1
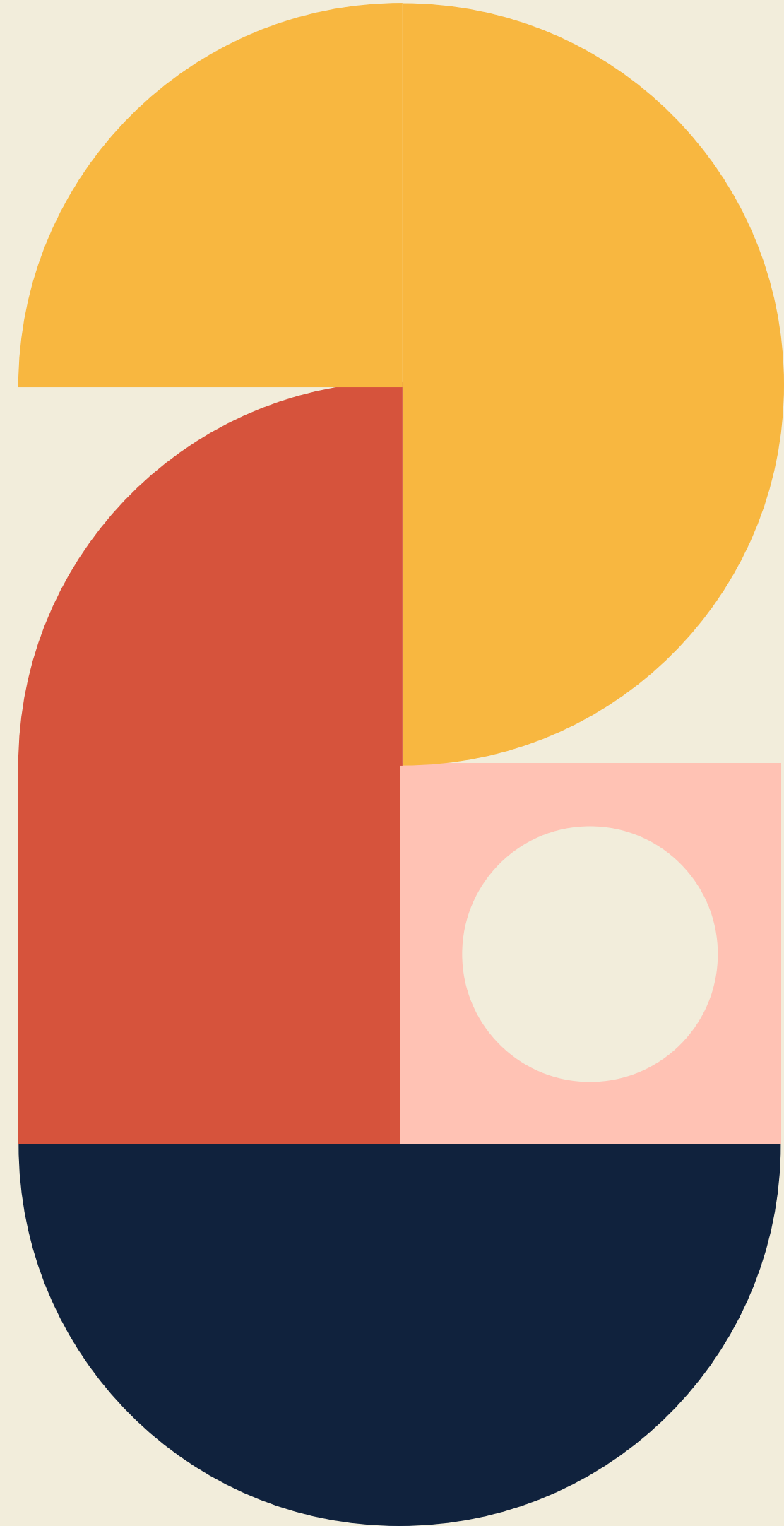
ACCURACY BY EPSILON

TIME BY EPSILON

06

EVOLUTION

It is possible to do more ?

07

CONCLUSION

08

SOURCES

"A Simple Algorithm for Nearest Neighbor
Search in High Dimensions Sameer"
A. Nene and Shree K. Nayar.

"Visual Learning and Recognition of 3-D Objects
from Appearance"
HIROSHI MURASE and SHREE K. NAYAR