2020-03-22

Contents

Chapter 1

Life, thin and light-off time and time again
Frivolous tireless

Chapter 2

Introduction

2.1 1.1

scalar

vector
xx X X_1 X_2

matrix
A

tensor
A “A” A (i, j, k) $A_{(i,j,k)}$

0

/ /

2.2 1.2

- “ ” “ ” n n “ ”
-
- 3×3
- 1×1 1×3

2.3 1.3

m n n m

2.4 1.4

$\vec{a} = [-5, 6, 8, -10]$ $\vec{x} = (x_1, x_2, ..., x_N)$

- 1 $\vec{a}$ 1 29

$$\|\vec{x}\|_1 = \sum_{i=1}^{N} |x_i|$$

- 2 $\vec{a}$ 2 15

$$\|\vec{x}\|_2 = \sqrt{\sum_{i=1}^{N} |x_i|^2}$$

- $\vec{a}$ 5

$$\|\vec{x}\|_{-\infty} = \min |x_i|$$

- $\vec{a}$ 10

$$\|\vec{x}\|_{+\infty} = \max |x_i|$$

- p

$$L_p = \|\vec{x}\|_p = \sqrt[p]{\sum_{i=1}^{N} |x_i|^p}$$

$A = [-1, 2, -3; 4, -6, 6]$ $A_{m \times n}$ a_{ij}

$$\|A\|_p := \sup_{x \neq 0} \frac{\|Ax\|_p}{\|x\|_p}$$

,

- **1** , A 1 $[5, 8, 9]$ 9

$$\|A\|_1 = \max_{1 \le j \le} \sum_{i=1}^{m} |a_{ij}|$$

- **2** $A^T A$ A 2 10.0623

$$\|A\|_2 = \sqrt{\lambda_{max}(A^T A)}$$

$\lambda_{max}(A^T A)$ $A^T A$ - A 1 [616] 16

$$\|A\|_\infty = \max_{1 \le i \le n} \sum_{j=1}^{n} |a_{ij}|$$

- svd —— A 10.9287
- **L0** 0 L0 0 A 6
- **L1** L0 A 22

- **F** L2 A 10.0995

$$\|A\|_F = \sqrt{(\sum_{i=1}^{m} \sum_{j=1}^{n} |a_{ij}|^2)}$$

- **L21** F 2 L1 1 L1 L2 A 17.1559
- **p**

$$\|A\|_p = \sqrt[p]{(\sum_{i=1}^{m} \sum_{j=1}^{n} |a_{ij}|^p)}$$

2.5 1.5

- 0

- C $C^T C$
- n
- E E
-
-
-

Chapter 3

Literature

Here is a review of existing methods.

Chapter 4

Methods

We describe our methods in this chapter.

Chapter 5

Applications

Some *significant* applications are demonstrated in this chapter.

5.1 Example one

5.2 Example two

Chapter 6

Final Words

We have finished a nice book.