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Sihoon Choi exercises updated

 History

 0 contributors





Raw

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969 lines (969 sloc) 396 KB

Table of Contents

- 1 Matrix-vector multiplication
 - 1.1 Exercise: Write a function that uses for loops to multiply a matrix and a vector.
 - 1.2 Exercise: Create your own Vandermonde matrix
- 2 Norms, inner products, and orthogonality
 - 2.1 Exercise: Create an orthonormal version of the Vandermonde matrix
- 3 Rank, Inverses, and Linear Systems
 - 3.1 Exercise: See how the rank changes if redundant equations are selected.
- 4 Eigen and Singular Value Decompositions

Linear Algebra

Linear algebra is required for all engineers, but the conceptual aspects are often not taught or have been forgotten, so it is useful to have a refresher on some key concepts.

Matrix-vector multiplication

First, some definitions:

- Dot product or "inner product":

$$\vec{a} \cdot \vec{b} = \sum_i a_i b_i$$

- Matrix/vector multiplication:

$$\vec{A} \vec{x} = \sum_j A_{ij} x_j = b_i$$

- Matrix/matrix multiplication:

$$\vec{A} \vec{B} = \sum_j A_{ij} B_{jk}$$

Exercise: Write a function that uses for loops to multiply a matrix and a vector.

Input:

```
A = np.array([[0, 1], [2, 3]])
B = np.array([0, 1])
```

```
for i in range(A.shape[0]):
    sum = 0
    for j in range(A.shape[1]):
        sum += A[i][j] * B[j]
```

