Chapter 1 Introduction

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Personal statement

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Course information

- Prerequisite courses: **Linear Algebra**, Mathematical Analysis, Data Structure and Algorithm;
- Book: Timothoy Sauer, Numerical Analysis 3rd Edition;
- Contents: 5 chapters: 2, 3, 4, 5 and 12;

Course requirements

- No homework, but 2 tests each of which costs 140 mins;
- Date of 1st test: To be determined.
- Date of 2nd test: 2021-12-10 (Friday, 15th week).

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- 5 experiments (each for Chapter 2, 3, 4, 5 and 12);
- 1 team with at most 2 students.

Introduction to Numerical Analysis

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  1. encodes finite real numbers ($2^{64} \approx 18.446 \times 10^{18}$ real numbers);
  2. for a range of real numbers ($\pm 2.23 \times 10^{-308}$ to $\pm 1.80 \times 10^{308}$), it have an approximate representation;
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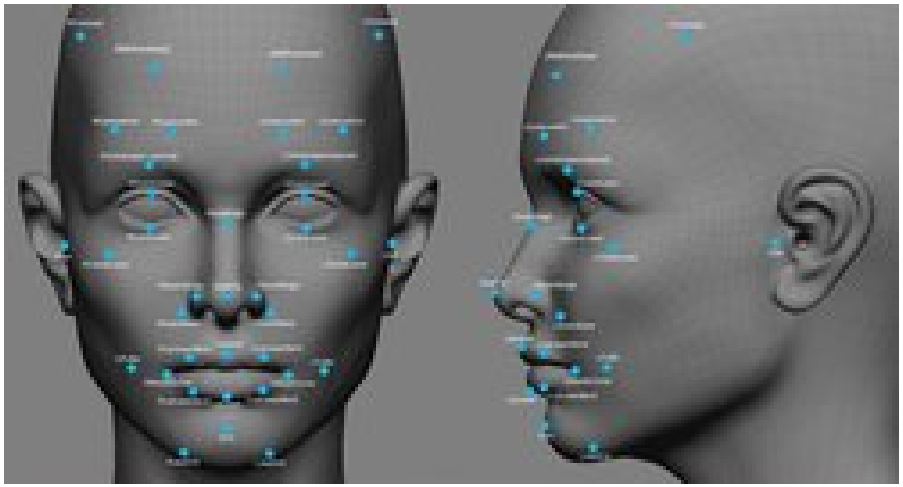
  3. supports addition, subtraction, multiplication and division of two real numbers.
- Problems:
  1. Solve a linear equation;
  2. Find an eigenvalue of a matrix;
  3. Generate a function that matches some given points;
  4. Evaluate an integral;
  5. Solve an ordinary (or partial) differential equation.

Applications: Search engine

Applications: Deep learning

Applications: Pattern recognition



Applications: Investment analysis

Thank you!