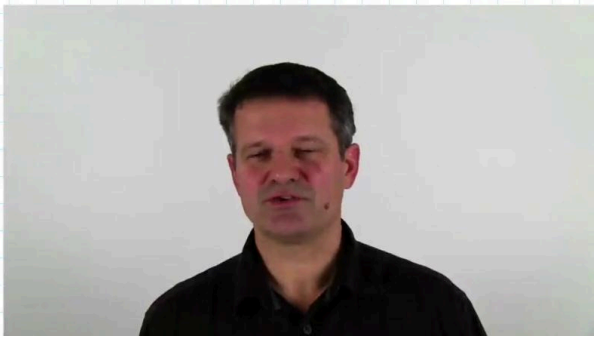
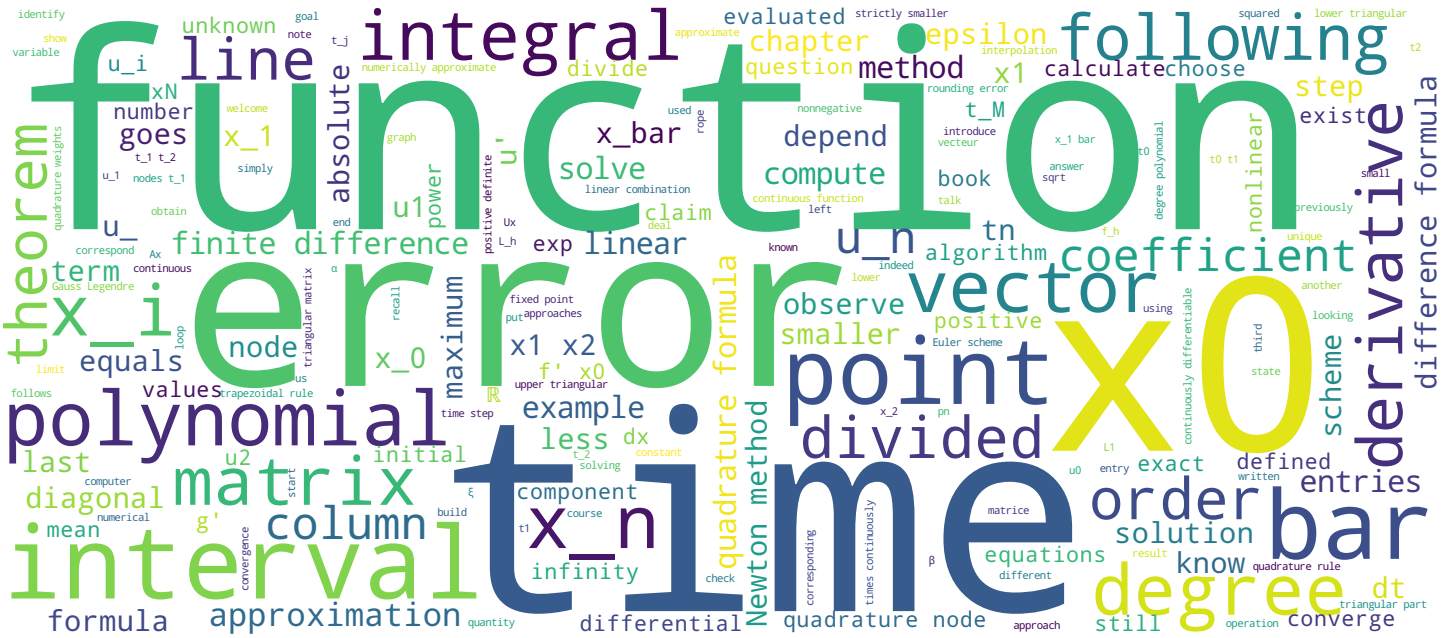
Chap. 3 : Intégration numérique - Formules de quadrature

- Généralités : approcher numériquement $\int_a^b f(x)dx$
- Formules de quadrature
  - poids d'intégration
  - points d'intégration
- Formule du rectangle, du trapèze, de Simpson
- Formules de Gauss-Legendre





Video

EPFL

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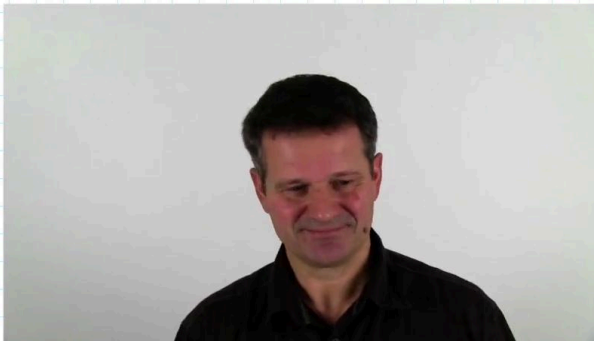

Hello and welcome to chapter 3: "Numerical integration and quadrature formulas" Today we will deal with the following problems. First we will define the problem. The goal is to numerically approximate the integral of a continuous function f on the interval [a,b]. Say the function f is exp(x^2), there is no explicit primitive for this function. We will introduce the quadrature formula, we will talk about quadrature weights, quadrature nodes, we will build the rectangle rule (or mid-point rule), the trapezoidal rule, which are straight forward rules. Next Simpson's rule which is a bit more complicated, but more accurate. And finally, the interesting topic, the Gauss-Legendre quadrature rules.

Notes

Summary

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