

# Introduction to Computer Assisted proofs in Analysis

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## Abstract:

The goal of these lectures is to present an introduction to the theory and the practice of computer assisted proofs in analysis. That is, we plan to discuss how to use computers to verify systematically bounds. The main tool is the "interval arithmetic" introduced by R. Moore in the 60's. We plan to discuss the theory and the practice and to present some practical programs that actually carry out the computations indicated.

1. Introduction to Interval Arithmetic. The IEEE standard.
2. Interval analysis in function space. Spaces of polynomials, Sobolev spaces, Splines.
3. Practical implementations. Controlling the IEEE standard. Modern computer languages. Some publicly available packages.