A Brief History of Interval Analysis

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In this talk, we discuss the origin and early history of interval analysis. We describe Moore's early work and the work of others that Moore influenced directly. We discuss highlights and milestones in the development of interval analysis. Some topics are:

- The origins of interval arithmetic
- Alternatives to intervals (circular arithmetic, ellipsoids, parallelopipeds)
- Extended interval arithmetic
- The development of means for using interval arithmetic
  - subroutines, precompilers, compilers, languages
- Moore's early work
  - concepts, terminology, and properties of interval arithmetic
  - theorems
  - application of interval analysis to various problem areas
- Early reports, papers, and books
- People who influenced the development of interval analysis
- Interval analysis in Germany
- The development of tools for use in interval computations
  - evaluation of irrational functions
  - representation of interval functions (centered forms, etc.)
  - Taylor expansions, automatic differentiation
  - slopes, generalized interval arithmetic
- The development of interval methods in various specific problem areas
  - linear algebra (Gaussian elimination, preconditioning, eigensolutions, etc.)
  - nonlinear equations (methods, existence and uniqueness, etc.)

- optimization
- ordinary differential equations (initial value and boundary value problems)
- partial differential equations