DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
ODENSE UNIVERSITY

COMPUTER SCIENCE COLLOQUIUM

MSB-first Digit Serial Arithmetic

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Tuesday, February 14, 1995, at 2:15 PM
The Seminar Room

Abstract: We develop a formal account of digit serial number representations by describing them as strings from a language. A prefix of a string represents an interval approximating a number by enclosure. Standard On-line representations are shown to be a special case of the general digit serial representations. Matrices are introduced as representations of intervals and a finite-state transducer is used for mapping strings into intervals. Homographic and bi-homographic functions are used for representing basic arithmetic operations on digit serial numbers, and finally a digit serial representation of floating point numbers is introduced.

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