Moses, Joel
Macsyma: A personal history. (English) Zbl 1231.68291

This article appears in a special issue of the Journal of Symbolic Computation, in honor of Keith Geddes on his 60th birthday. A small part of the article discusses the relationship between Macsyma and Maple, but the article is really about the life and death of the computer algebra system (CAS) Macsyma, with added observations on organization, primarily of computer systems, but also of corporations.

As a CAS funded by ARPA, Macsyma in its heyday was at the forefront of a number of cutting-edge developments, either developing them or making them quickly available via its node on the ARPANET. Moses’ PhD work was on symbolic integration, so there is naturally quite a bit of discussion on that. Work on Macsyma provided the impetus for several PhD students, and we learn how the distinction between sparse and dense polynomial implementation brought its ARPANET node to a screeching halt. This surprise led eventually to new algorithms, such as Moses and Yun’s EZ GCD algorithm.

As Macsyma was built on LISP, the article provides a number of insights on both the development of LISP compilers and AI. Moses recounts some of the trials of hardware constraints and vendors, including DEC’s surprise change from PDP-10 to VAX. It also describes the birth and growth of what was to become SIGSAM, ACM’s Special Interest Group on Symbolic and Algebraic Manipulation, and recounts some of the history of the CAS’s of the time. Several insights are given for why symbolic computation was of such high interest at the time, the AI winter, and the demise of commercial Macsyma.

A short, concluding section attempts to extrapolate Moses’ experience with both managing the Macsyma project and as an administrator in academia to the crisis in US manufacturing.

Reviewer: John Perry (Hattiesburg)

MSC:
68W30 Symbolic computation and algebraic computation
68N01 General topics in the theory of software
68T35 Theory of languages and software systems (knowledge-based systems, expert systems, etc.) for artificial intelligence

Keywords:
Macsyma; artificial intelligence; LISP; gcd; computer algebra systems; Maple

Software:
ALGOL 60; Maple; REDUCE; SCHOONSCHIP; MACSYMA; IBM Scratchpad

Full Text: DOI

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