ICM-9308-56 User Interfaces for Symbolic Computation: a Case Study, Norbert Kajler.

ABSTRACT Designing user interfaces for Symbolic Computation tools like Maple, Mathematica, Reduce, etc, implies solving some challenging difficulties, including the display and manipulation of mathematical formulas, efficient and user-friendly manipulation of possibly large expressions, deep extensibility of the user interface, etc. This also implies dealing with some complex communication issues in order to efficiently integrate under a common user interface a set of tools from different origins running across a distributed architecture. This includes transparent management of remote computations, hiding command language variations, and programmability of the whole environment so that one can solve complex problems by sequentially and/or concurrently applying any needed tools. Very few of these problems are addressed by the user interfaces of commercially available packages. To improve user interfaces and integration of Symbolic Computation tools, a prototyping system named CAS/PI as been implemented. Its main characteristics are to be highly flexible and extensible, and to be based on pre-existing software engineering technologies. Using CAS/PI, each of the previously stated problem may be solved in a generic way, allowing further experimentations and optimizations.