

MENULAY - AN AUTOMATIC PROGRAM GENERATION MODULE
FOR A USER INTERFACE MANAGEMENT SYSTEM

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SUMMARY

MENULAY is a high-level preprocessor for specifying graphical and functional relationships in the user interface of interactive programs. The tool is of particular relevance to applications programmers developing menu-driven software, especially systems which make use of a pointing device such as a graphics tablet. It allows the programmer to use efficient interactive graphics techniques to design menu layouts. MENULAY also permits the specification of the actions and responses that are to result from user interactions with elements of the menu. Networks of menus may be defined, with arbitrary branching from one screen to another. An important aspect of MENULAY is that its output is in the form of commented high-level code which the programmer can compile with application-specific routines in order to arrive at a complete working system.

MENULAY is a preprocessor. The code and tables which it generates are used by the runtime module of the user interface management system. The runtime package relieves the applications programmer of details such as visual feedback, hit detection, event invocation, and display updates. MENULAY is a tool that facilitates specifying and formatting the data and procedures used by this runtime package. Being thus freed from low-level details, the user of MENULAY is better able to concentrate on application-specific design and programming. As a result, increased experimentation with, and refinement of, the user interface is rendered economically viable. The limitations imposed by the system are minimal. Since the output is readable documented C code, it may be modified by the programmer in order to make adjustments or implement extensions not foreseen by the menu system designer.

Other user interface management systems, such as TIGER [Kasik 82], do a similar task of standardizing user interfaces and taking much of the bookkeeping and low-level input processing away from the applications programmer. MENULAY, however, goes further in that it greatly facilitates experimentation with the graphical layout and interaction dialogue specification. While the dialogue design tool FLAIR [Wong 82] currently supports a greater repertoire of input techniques (such as voice recognition), it does not appear to be as flexible in its integration with the programmer's own code.

Experience with the MENULAY package has been gained through the development of a number of applications programs and prototypes, including a sketch editor, a figure and flowchart editor, an interactive graphical tool for the teaching of musical notation, numerous computer-assisted instruction lessons and the design of successive versions of MENULAY itself.

MENULAY does not try to be everything at once. The authors maintain that the ideal user interface management system consists of a number of separate tools or modules, of which MENULAY is but one example. Other examples include sketch editors, text editors and interactive debuggers.

A detailed description of MENULAY and its underlying user interface management system is found in [Buxton 83a]. A videotape showing the use of MENULAY is available as [Buxton 83b].

REFERENCES

- [Buxton 83a] Buxton, W., M.R. Lamb, D.M. Sherman & K.C. Smith, "Towards a Comprehensive User Interface Management System". To appear in *Computer Graphics*, Vol. 17(3), Proceedings of the 1983 SIGGRAPH Conference, Detroit, July 1983.
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