

## ICKit: An Instrument Construction Kit for Software-Based Instruments

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With the advent of knowledge-based systems it has become increasingly clear that the assessment and acceptance of them by (naive) users crucially depends on their transparency. One solution to this problem are tools that allow a human communicating to knowledge based systems to probe their inner working in order to understand the state they are in or the decisions suggested by them.

Drawing from experience in other engineering disciplines (e.g. cockpit design in cars and planes) and building on top of some mechanisms built in the LOOPS environment (5) we have developed and implemented ICKit, a rich toolbox with mostly graphical, software-based instruments, gauges, scales, indicators, switches and buttons, to name just a few. This research follows the very general idea to build a *software oscilloscope* (cf. (2; 1)). The *software oscilloscope* consists of a large set of tools to inspect and visualize data and control flow in a running program.

ObjTalk (4; 3), an object-oriented programming language, is the vehicle as well as the target for the implementation. A large variety of instruments may be constructed from our "instrument construction kit". The properties of these instruments are specified by a multiple inheritance lattice of classes that specify (among others) the appearance and behavior of the instruments. The instruments assembled can easily be used by connecting and disconnecting them to/from one or several slots of any ObjTalk object. Once connected, they display the value(s) of the slot connected to.

The ease of construction and use of the software-based instruments generated by ICKit suggest that it is an appropriate tool to make knowledge based systems as well as other complex software (e.g. operating systems) transparent. The ICKit has been used (among others)

- to generate instruments in a simulated electronic laboratory.
- to design a panel of instruments which monitor the paging behaviour, cpu use and several other system parameters of an operating system.

### References

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