

Information Technology and Communication

L. Johnson, *Centre for Information Technology, Brunel University, Uxbridge*

My research is interdisciplinary, but with computing as a focus. In particular, I have been attempting to contribute to our understanding of how to design and develop human-computer systems; this is essentially the study of computer applications in industry, medicine, education and engineering. The distinctive feature of my research is that it unifies what are thought to be separate – the unifying notions come from my work in expert systems. In the expert systems field, I have devised (Johnson, 1985a; 1985b) and applied a methodology dealing with the whole spectrum of the design and development process, thus contributing to our understanding of how to obtain a characterization of knowledge suitable for the generation of sophisticated computer explanations of problem solving, knowledge and reasoning. This has involved the devising of new computer knowledge architectures.

The problem of human-computer interaction is pursued from the perspective found in Ogborn and Johnson (1984) and this gives a particular accent on the knowledge elicitation process (Johnson and Johnson, forthcoming). The central tenet of the approach is that the primary 'object' to be designed in a human-computer system is an interaction. This interaction should embody characteristics related to the problem-solving strategies of users and these are best implemented through the techniques of artificial intelligence. One aim of knowledge elicitation is to obtain this characterization – irrespective of whether the system is

a knowledge base system or not, thus contributing to our understanding of systems analysis.

In the next few years I will have applied the methodology and techniques in an Alvey demonstrator project 'Business Applications of Expert Systems'. In addition, together with Dr N.E. Johnson, I should have made a significant clarification in our understanding of VLSI design methodologies and how these may be integrated into expert system components of CAD units. In the medical field a group of hospitals and universities are investigating the management of critically ill patients; they are using the notions expressed in the papers referenced and I hope to contribute fully to all projects that may arise.

References

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