reader enquiring at any more than a superficial level. So many topics receive a mention that few, but the obvious, receive a satisfactory explanation. Perhaps precisely because this books sets out to treat so many of the implementation issues for so many readers, it may not maintain the interest of any of the intended audience for all of its duration.

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Computers and conversation edited by Paul Luff, Nigel Gilbert and David Frohlich, Academic Press, London 1990, pp 284, £14.50, ISBN 0-12-459560-X.

This book is an attempt to bring the findings and methodology of conversation analysis to bear on human-computer interface design. The book, one in Academic Press' "Computers and people series", grew out of a symposium held at the University of Surrey in 1989. It is aimed primarily at those working in human–computer interaction (HCI), and includes both theoretical and applied papers, most of which are well written.

Conversation analysis (CA) is a research discipline with strong sociological roots. It is concerned with the organization of conversation in everyday interaction, including the structure of conversation openings and closings, and descriptive rules governing turn-taking, change of topic and repair. An introductory chapter by Robin Wooffitt makes the book accessible to those with little or no background in CA. Wooffitt both emphasizes the sociological aspects of CA and illustrates its findings with examples from the structure of lists of an analysis of teasing. Further useful introductory information concerning some of the findings of CA arises throughout the text (in, for example, the contribution of Norman Thomas and Button), and notes on transcription are included as an appendix.

The book lacks a clear organizational structure, and the sound introduction is followed by what I found to be a confusing discussion of the relationship between HCI and software engineering. In "Towards a sociology of human-computer interaction: a software engineer's perspective", Hugh Robinson argues for a sociology of HCI based on ethnomethodological ethnography. The chapter does not flow neatly from the previous introduction, with the link to CA being weak and only explored in the latter sections of the paper.

The track returns to firmer ground with a discussion by Norman and Thomas of the roles that CA can play in HCI design. They emphasize that both the methods and the findings of CA have applicability in HCI design: human–computer interactions may be constructively analysed with the methods of CA (i.e. in the context of conversational openings, closings, repair, etc.); and the general findings of CA (such as, for example, on the expectations of people in the structuring of repair conversations) can inform HCI design. The authors admit that the insights from CA as presently formulated are no better than previous HCI guidelines, but hope that this could be restricted by an adequate framework describing HCI.

A note of debate is introduced to the volume via Graham Button's contribution, "Going up a blind alley: conflating conversation analysis and computational modelling". Button argues that it is inappropriate to use the rules developed within CA as rules within diaglogue systems to control human–computer conversations. The arguments are reminiscent of those put forward by some connectionists arguing against symbolic accounts of cognitive processes, and might be summarized by claiming that the rules that CA develops correspond to emergent regularities. They play no causal role, and as such computational models which follow such rules are misguided. Button's point seems valid, but is blunted by the earlier remarks of Norman and Thomas, who acknowledge that the role of CA in HCI is not to mimic human conversational behaviour, but "rather to provide for the design of interaction in ways which are 'in accordance with expectations' about interaction" (their emphasis). The cautious line is continued by Paul McIlvenny, who complains that "research in empirical investigations of communicative action" has disembodied conversation analysis, and

that "looking at the dynamics of human interaction is essential for computer modelling and design, but this does not necessarily imply developing a mechanistic double or copy."

These methodological discussions are followed by two chapters on the theory of repair. David Good examines the nature of repair in a conversation between a clinical psychologist and a thought disordered schizophrenic. Whilst the content of the patients replies appears irrelevant, he does adhere to conventional conversational structures. Pirkko Raudaskoski continues the theme in a more applied context, describing and evaluating an interface to a simple message recording system. Whilst the system is clearly naive in many respects, it makes use of, and responds to, several standard repair strategies.

Again, the thread of the book turns, this time with Anthony Finkelstein and Hugo Fuks' chapter on "Conversation analysis and specification". Here, the authors sketch preliminary work which aims to use analysis of discourse generated at specification meetings to model the software engineering process. In truth, the paper provides only the germs of an approach, making the content difficult to judge. For this, we await future work, where Finkelstein and Fuks hope to provide "a detailed analysis of the structure of elicitation and verification strategies."

In an applied paper more in line expectations, David Frohlich and Paul Luff argue the case for "Applying the technology of conversation to the technology for conversation" by considering a particular system, The Advice System, and showing how the system has been shaped by the inclusion of the findings of CA. The authors support their decision to employ CA findings over other approaches to discourse (such as scripts, discourse grammars and speech act theory) by emphasizing the "interactional" nature of conversation. They then go on to describe The Advice System in detail, illustrating how the current context limits what can be said next, as well as the system's diaglogue control policies for opening, turn-taking, repair, preclosing and closing.

Tutoring systems are in many respects opposite to advice systems, and in the following chapter it is within the context of tutoring systems that Alison Cawsey argues that global planning is as important as local coherence if a system is intended to instruct. Central to her system is the ability to respond to interruptions, elaborating on misunderstood points before returning to a partially specified global plan.

In the final paper, "Organising computer talk", Nigel Gilbert, Robin Wooffitt and Norman Fraser appeal to many standard techniques from computational linguistics to argue that the findings of CA can be usefully applied to the design of computer systems. First, they provide a fragment of a grammar for some adjacency pairs (such as question/answer pairs, which may be embedded or interrupted) and illustrate how chart parsing techniques might be applied to generate the structure of a dialogue composed of such pairs. They then counter some arguments against the application of CA findings in computer systems (the problems of indexicality and the role of CA rules) by appealing to the techniques and progress of computational linguistics. The paper illustrates well the need for researchers in related disciplines to talk, and listen, to each other.

To sum up, the volume amounts to an impressive argument for the use of the techniques and findings of conversation analysis in the design of human-computer interfaces. Though I have some qualms about the organizational structure of the book, my major criticism is perhaps that it doesn't go far enough in developing complete practical systems; the papers focus on individual tasks and domains, and they cry out for a unifying final chapter. At the same time, however, it does leave the reader with some idea of how the individual ideas might be elaborated and integrated.

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