Errors and Intelligence in Computer-Assisted Language Learning: Parsers and Pedagogues

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As is immediately clear from its name, Computer-Assisted Language Learning (CALL) is a field in which computers and language play key roles. To conclude from this that CALL would be a prominent area of computational linguistics, however, would be hugely mistaken. Handbooks and journals of computational linguistics, including this one, do not usually have articles on CALL. Nerbonne (2003) is a rare exception. Conversely, journals devoted to CALL (e.g., *CALL, ReCALL, CALICO*) contain many articles that readers of this journal would consider far outside the domain of computational linguistics. They are devoted, for instance, to the use of email or chatting in language teaching.

Nevertheless, I think there is every reason for computational linguists to be interested in CALL. And the book under review is a very good starting point, for the part of CALL that is likely to be of most interest to computational linguists that is the topic of this book. Often this is called **intelligent CALL** (ICALL), but the authors prefer to call it **parser-based CALL**. Parser-based CALL is informed on the one hand by second-language acquisition theories and teaching practice, on the other by natural language processing and artificial intelligence. The purpose of this book is to give an overview of the relevant issues and the state of the art in each of these issues in a way that is accessible to practitioners of all of these fields. Computational linguists without a background in language acquisition will therefore get a good foundation in all the relevant domains to become fully updated on (the most interesting part of) CALL, but they will have to put up with (or skip) basic introductions to, for instance, the theory of formal grammar.

The book consists of a brief introduction, four chapters (which the authors consistently call "parts") giving an overview of the current state of parser-based CALL, and a conclusion with an outlook. The introduction identifies the subject field and gives an overview of the structure of the book.

Chapter 2, "NLP in CALL," is by far the longest (74 pages). It starts with an argument about the highly interdisciplinary nature of the field and the influence of different currents of psychology. Three sections (37 pages together) are devoted to an outline of the history of computational linguistics and an overview of parsing. The final section (30 pages) is an overview of parser-based CALL projects. This section has a wide coverage with many references, while at the same time providing a useful classification of systems and the issues they focus on.

Chapter 3, "Error Analysis and Description" (31 pages), is devoted to the analysis of student input. Regular parsers are not optimal for use in a CALL context, because they start from the assumption that the input is correct. In the case of CALL, identifying errors is a central issue. Even spelling checkers and grammar checkers, though designed to recognize errors, are not readily usable in CALL because learner errors are not the

same as errors made by native speakers. The section on error analysis (19 pages) is the heart of this chapter. It covers both the relevant developments in second language acquisition theory and a detailed description of the identification of errors in a system by one of the authors. A final section is devoted to corpus linguistics and the use of learner corpora.

Chapter 4, "Feedback" (56 pages), takes the reader on a rather long general tour before arriving at CALL. After sections on feedback in general, in human–computer interaction, in general learning, and in language learning, as well as the general problem of language generation (together 20 pages), it is only Section 4.6 that treats "Feedback in CALL." This section and the next (together 36 pages) give an overview of the issues including the problem of giving feedback that is used and understood by the learner and the requirements on system design. The discussion is again based on a detailed description of a system by one of the authors.

Chapter 5, "Student Modelling" (41 pages), devotes again a long section to general issues (21 pages) before the topic in the title is explored from the perspective of parser-based CALL. In this case, this is understandable because most of the problems encountered in the latter are specific versions of problems of Intelligent Tutoring Systems for areas other than a second language.

Chapter 6, "The Past and the Future" (15 pages), starts in the by-now-familiar way with some general thoughts about the problems of predicting future developments before sketching some of the current lines of development.

On the whole, the book is a very useful overview of a field of application that, as I have argued elsewhere (ten Hacken 2003), is very much in line with modern trends in computational linguistics because it aims for the solution of real-life, practical problems rather than abstract, general problems such as understanding natural language. Research students and academics will find a wealth of well-organized information and references for further study. The fact that the authors often take their own work as a basis for illustrating certain general ideas should not be held against them because of their prominent position in the field. In some cases computational linguists can skip the first section(s) of a chapter because they will already know the topic to a higher standard than achieved here, but this is the price for having an accessible introduction for all of the surrounding fields of research.

One problem with this book is that it shows signs of a rushed production process. We can live with inconsistencies in section numbering, but inaccuracies in the references are more disturbing. For a book that is unique in its kind and could have been a highly useful reference work it is particularly disappointing that the index is poor and no detailed table of contents is provided. This makes it difficult to access the wealth of information contained in the book efficiently. Despite these problems, the book is a must-read for any computational linguist intending to start work in the field of CALL.

References

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