

Computational Linguistics and its Use in Real World: the Case of Computer Assisted-Language Learning

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Surprising as it may be, one of the biggest markets for products of computational linguistics (CL) has been largely overlooked: the classroom. While machine translation has attracted a considerable amount of research, hence resources, CALL,¹ a domain with a comparable potential, has hardly ever received the attention it deserves. Actually there seems to be a communication problem and a mutual lack of interest concerning the work done in the neighbouring disciplines.

Computational linguists don't show much interest for CALL, and CALL experts ignore the work done by computational linguists. Strangely enough, even within the ITS, CAI, CBI OR ICAI communities, little, if any reference is made to work done in CALL (4, 10, 13, 15, 18, 24, 25, 26, 28, 30, 33, 35). This being so, it is hardly surprising to see that the domain is never mentioned in textbook on Artificial Intelligence or Psycholinguistics. Yet there are a number of publications in psychology that deal with related issues such as *learning theory* (12), *language learning* (5, 6, 11, 14, 20), *language teaching* (6, 16, 19, 27), *educational technology*, i.e. programmed instruction (9, 12, 31), *theory of writing* (3), *algorithmization* of the learning process (17), *learning strategies*, i.e. learning how to learn (23), etc.

It is also worth mentioning that no cross fertilization has taken place between the CALL community and people working in the Machine Learning paradigm (7, 21).² While there are fundamental differences in terms of goals and methods, there are also some important overlaps. Books on more sophisticated CALL systems are still scarce (13, 32), so is the work that shows how current NLP technology could be used in the classroom (1, 22, 34)

Yet CALL is a field with considerable potential. It is both a challenge and a chance to bring NLP

technology from the research laboratories to the real world. While computational linguists will certainly have to play an important role in providing linguistic resources (grammars, lexicon) and processing tools, it is not clear yet how to decide on the adequacy of the tools (browser, editors). Also, there are good chances that within this context new problems arise, while old solution turn out not to be good at all, in which case the following two questions arise: what is the nature of these new problems?, and in what terms do these new problems have to be rethought? Other related issues of interest are the following:

- what can current NLP technology contribute to computer-assisted language learning?
- how can this technology meet the demands of pedagogical theory for communicative language teaching in a natural environment?
- what can NLP-based systems teach us about language acquisition, linguistic theory and NATURAL language processing in general?
- what effect can a domain like CALL, or the involved disciplines have on the development of NLP technology?
- what lessons have been, or can be learned by looking at the available CALL systems?

In order to get a clearer picture of these problems, and in order to draw the community's attention to the fact that there is a REAL need and potential for integrating NLP technologies in CALL systems, we propose a panel discussion between specialists in the concerned disciplines (linguistics, artificial intelligence, psychology, language teaching). The expected results of such a discussion are not only an increase of resources (manpower) in the CALL domain, but also an increase of awareness, that is, a sharpening of the researchers' understanding of what the problems are that people encounter when processing language. All too often we look at language only from the point of view of the machine, i.e. how can languages be processed by computers. In doing so we tend to forget the obvious : natural languages are used by people.

¹ Unlike *ITS* (Intelligent Teaching Systems), *CAI* (Computer Assisted Instruction), *CBI* (Computer Based Instruction) and *ICAI* (Intelligent Computer Aided Instruction), which use language for communicating domain specific knowledge, CALL has language learning as its primary goal. Obviously, NLP-technology may be relevant for all these systems, but in different ways.

² For a slightly outdated bibliography on CALL, see (2).

In building CALL systems we will realize that there are many problems in the area of natural language processing that have been either overlooked, or been posed in inadequate terms. Yet, if we really want to get a real understanding of the functioning of natural languages, —how they are used, how they are learned?— we have to look at the constraints of the system for which they have been designed: man. This is the price we have to pay if we want to produce programs that are of interest not only in the research labs but also into the arena of real world.

Strangely enough, in the past we had neither the right tools, nor a decent theory (see 8, 27, 31), yet people were optimistic and went ahead. Today we are much better off. We do have very powerful tools (fast computers with well designed graphical interfaces, browsers, CD-Roms, authoring languages), and a whole set of quite promising theories, yet we hesitate. But, what are we waiting for?

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