11 WSD in NLP Applications

Philip Resnik
University of Maryland

*When is word sense disambiguation useful in practice? This chapter considers applications of word sense disambiguation in language technology, looking at established and emerging applications and at more and less traditional conceptions of the task.*

11.1 Introduction

In discussing the role of word sense disambiguation in natural language processing, it is helpful to make the distinction between an *enabling technology* and an *application*. An enabling technology produces a result that is not useful by itself; an application performs a task that has direct value to the end user, to which an enabling technology can contribute. To take an everyday example, an electricity adapter converting between 220 volts and 110 volts is an enabling technology, since by itself it has no direct connection with a user’s needs. Its value emerges in combination with a larger application of technology, such as an electric razor that works in both the United States and Europe. As Agirre and Edmonds (Chapter 1) point out, word sense disambiguation (WSD) is an enabling technology, as are other common NLP tasks like part-of-speech tagging and parsing. These can be distinguished from language applications like machine translation and the automatic transcription of speech.

A voltage converter has a well defined task: converting electric current from $N$ volts to $M$ volts within some clearly specified tolerance. This task is the same whether the converter is used with an electric razor, an espresso maker, or a television set. In contrast, there is no universally accepted characterization of the WSD “task”, and in fact it has been argued...
that defining WSD in an application-independent way makes little sense (see Chap. 2). In this chapter on applications, therefore, I begin in Section 11.2 with the basic question of why people believe WSD should matter in applications at all. In Sections 11.3 and 11.4, I consider how different conceptions of word sense relate to a variety of specific applications, and in Section 10.5 I briefly summarize and conclude with prospects for the future.

11.2 Why WSD?

Why do so many NLP researchers and developers remain convinced that WSD should matter in NLP applications? There seem to be three main species of argument.

Argument from Faith

A belief in the importance of WSD for applications is a part of the canon in natural language processing. It is passed from teacher to student and easily accepted on intuitive grounds – it just seems obvious that if bank can refer to either a financial institution or a riverbank, a search engine query must be more likely to pull back the wrong documents, an MT system must be more likely to arrive at the wrong translation, and so forth, unless the intended meaning of the word is picked from an enumerated list of the meanings it can have. Ide and Véronis (1998:1), in their valuable overview of sense disambiguation and its history, begin by saying that WSD is “obviously essential for language understanding applications such as message understanding, man-machine communication, etc.” and “at least helpful, and in some instances required” for applications such as machine translation and information retrieval where deep understanding may not be the goal. Like many firmly held beliefs, this idea is supported by widely quoted scriptural references, most notably Bar-Hillel’s (1960) famous “the box is in the pen” example, where it is taken as self evident that accurate translation of this sentence requires distinguishing among explicit senses of pen (‘writing utensil’ versus ‘enclosure where small children play’).¹

¹ The example is strained for speakers of American English, where the unambiguous playpen would have to be used. Surprisingly, given the example’s longevity, British informants find it unnatural also.