Robustness in Language and Speech Technology

Jean-Claude Junqua and Gertjan van Noord (editors)
(Panasonic Speech Technology Laboratory and University of Groningen)

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This book stems from the Sixth Summer School on Language and Speech Communication, held in Barcelona, Spain, in 1998, sponsored by ELSNET (The European Network of Excellence in Human Language Technologies) and the EU TMR (Training and Mobility of Researchers) program. The summer school, whose special theme was "Robustness: Real life applications in language and speech," is the third such summer school to give rise to a book in this Kluwer series, following on from edited collections by Young and Bloothooft (1997) and van Eynde and Gibbon (2000).

One slightly odd feature of the book, however, is that only 3 of the 10 courses given at the summer school are represented by chapters in the book; the remaining 6 technical chapters are invited contributions from other researchers. The chapter titles and authors, with an indication of whether the chapter originated from one of the courses, are as follows:

1. Introduction: Junqua and van Noord

2. Acoustic features and distance measure: de Veth, Cranen, and Boves

3. Speaker compensation in automatic speech recognition: Tapias (course: "Robust speech recognition")

4. Robustness in statistical language modeling: Bellegarda

5. Improving robustness by modeling spontaneous speech events: Heeman and Allen

6. Regular approximation of context-free grammars: Mohri and Nederhof

7. Weighted grammar tools: The GRM library: Mohri

8. Robust parsing and beyond: Chanod (course: "Finite-state parsing")

9. Robust parsing of word graphs: van Noord (course: "Robust efficient parsing for spoken dialogue processing")

10. Balancing robustness and efficiency: Rosé and Lavie

All of the chapters are at an introductory level and should be accessible to a computational linguistics researcher who is not a specialist in the particular area. Even though the material on speech processing requires some mathematical background

to understand fully, the main formulae are usually glossed and the text is illustrated where appropriate with graphs, histograms, and block diagrams so the less mathematical reader should come away with at least a broad understanding of the most important points. Although the book is targeted at the nonspecialist, there is a difference in overall style between, roughly, the earlier chapters on speech and those on language processing. Thus, chapters 2–4 consist of surveys and empirical comparisons of a number of different techniques, whereas the succeeding chapters place more emphasis on the authors' own work and less on comparing and contrasting competing approaches.

The publisher's publicity suggests that the book contains material that could be used in graduate or undergraduate courses. Some of the chapters might be suitable, but the book would be too expensive for most students. For teaching purposes, it might be worth waiting to see if ELSNET starts to sell the book at a discounted price, as they have done with the previous two summer school books.

The book contains very few typos and is in the main well written, except that the English in one chapter is unidiomatic. The chapter by Tapias refers the reader to potentially useful ancillary material (proofs and MATLAB programs) on ELSNET Web pages, but I was unable to find them there.

If this were the only recently published book that brought together robust language and speech processing in an accessible way, then I would have no hesitation in recommending it as a convenient reference. However, the book faces stiff competition from excellent books by Rayner el al. (2000) and Wahlster (2000), both on speech-to-speech translation. Each of these books forms a more coherent and satisfying whole, since they describe a single complete application system, making it easier for the reader to picture how the various pieces of robust processing technology fit together. Moreover, these books are only two-thirds of the price of Junqua and van Noord's, and if I were to buy only one book in this area it would be one of them.

References

Rayner, Manny, David Carter, Pierrette Bouillon, Vassilis Digalakis, and Mats Wirén. 2000. *The Spoken Language Translator*. Cambridge University Press, Cambridge, UK.

van Eynde, Frank and Dafydd Gibbon, editors. 2000. *Lexicon Development for Speech and Language Processing*. Kluwer Academic Publishers, Dordrecht.

Wahlster, Wolfgang, editor. 2000. *Verbmobil: Foundations of Speech-to-Speech Translation*. Springer, Berlin.

Young, Steve and Gerrit Bloothooft, editors. 1997. *Corpus-Based Methods in Language and Speech Processing*. Kluwer Academic Publishers, Dordrecht.

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