Language computations. Ed. by Eric Sven Ristad (DIMACS Series in Discrete Mathematics and Theoretical Computer Science, Vol. 17) Providence, RI: American Mathematical Society, 1994. Pp. xiv, 198.

This book is the official refereed conference record of the DIMACS Workshop on Human Language held at Princeton University on March 20–22, 1992. This workshop brought together linguists and computer scientists to foster a better understanding of the mental computations underlying the comprehension, production, and acquisition of language. Nine of the nineteen talks given at this workshop are represented in this volume, split over four categories: the phonetics/phonology interface, metrical phonology, learning frameworks and morphology. The intent was for linguists to state language problems in a computational manner and for computer scientists to present their analyses in a manner accessible to linguists. The papers in this book are, on the whole, faithful to this vision.

While this book does not give a general survey of language computations, it does include much original work whose methods and spirit should be applicable to computational problems in other areas in linguistics. Osamu Fujimura's 'C/D model: A computational model of phonetic implementation' (1–20) and András Kornai's 'Relating phonetic and phonological categories' (21–35) give new practical and theoretical frameworks, respectively, for linking continuous speech waveforms and discrete phonological representations, and expose some of the computational complexity residing in this seemingly simple interface. The papers on metrical phonology (Morris Halle & William Idsardi, 'General properties of stress and metrical structure' (37–69); B. Elan Dresher, 'Acquiring stress systems' (71–92); Luigi Burzio, 'Metrical consistency' (93–125)) are excellent presentations of the Universal Grammar-based procedures for stress assignment and acquisition championed by their respective authors. Both papers on learning frameworks are mathematically rich but may be difficult reading for non-specialists. Unfortunately, Ming Li & Paul Vitányi's 'Inductive reasoning' (127–148), on the unification of various induction principles within Kolmogorov complexity theory, hardly mentions linguistics at all. However, Jorma Rissanen & Eric Sven Ristad's 'Language acquisition in the MDL framework' (149–166) compensates with an application of the Minimum Description Length (MDL) Principle to learning stress-assignment. The final two papers, Eric Sven Ristad's 'Complexity of morpheme acquisition' (185–198) and Stephen Anderson's 'Parsing morphology: "Factoring" words' (167–183), respectively look at the computational complexity of morphological analysis in an autosegmental framework and describe those linguistic phenomena responsible for this complexity. The careful balance and interplay of linguistic and computational concerns in these last two papers make them the best embodiments in this collection of the spirit of the workshop, as well as excellent models for other such inter-disciplinary endeavors.

This book is a nice (if metrically skewed) compilation of the efforts of world-class linguists and computer scientists at communicating with and learning from each other. Though the Preface says that 'No article in this volume requires an expertise in either linguistics or computer science', there are undeniably times when some of both would help. This can be alleviated somewhat by consulting the background texts referenced in the Preface. Many readers will probably find this book an occasionally mystifying and intermittently infuriating ride. However, it is one well worth taking, if only to glimpse the directions which such efforts should take in the future. [*H. Todd Wareham, University of Victoria*]