Briefly Noted

The Structure of Multimodal Dialogue II

M. Martin Taylor, Françoise Néel, and D. G. Bouwhuis (editors)
(Defence and Civil Institute of Environmental Medicine, Toronto, LIMSI-CNRS, Orsay, and IPO, Eindhoven)

Amsterdam: John Benjamins Publishing Company, 2000, xviii+522 pp; hardbound, ISBN 90-272-2190-1 and 1-55619-762-4, Dfl 250.00, $125.00

That the terms "dialogue" (e.g., between humans) and "interaction" (e.g., between user and computer) can be used interchangeably is implicitly assumed throughout this collection of papers edited by Taylor, Néel, and Bouwhuis. That a dialogue typically involves the use of multiple "modes" of communication and that it has its own internal structure are of obvious import to those who work in application domains that require the collaboration of human users either with software systems or with one another through the use of mediating software systems. This collection, therefore, will be of interest to researchers who want to know about early attempts to apply the metaphor of multimodal human-human communication to collaborative domains such as these.

This volume is a long-delayed follow-up publication from a workshop held under the same title in Aquafredda di Maratea, Italy, in 1991.[1] The material in this volume is clearly not recent—the editors report that the authors were requested to bring the papers up to date, but since practically all of the works referenced by the papers in this volume predate 1994, it seems that their request was not made in the years prior to publication. This is also reflected in the absence of the notion of a communicative agent (although, due to its now-rampant overuse, some might welcome this) and the lack of reference to the work on embodied agents that emerged in the last decade and is clearly relevant (for example, Cassell et al. [1994] and much research since then). However, the publication of this volume does make previously difficult-to-find material more readily available and does provide an interesting historical context for contemporary research.

The application of the metaphor of human-human communication to human-computer interaction is hardly new—descriptions and discussions predate the 1980s (e.g., Nickerson 1977)—but it does invoke a certain amount of theoretical baggage. Those papers in this volume that contain discussions that address (however obliquely) such issues are perhaps of more enduring interest than those that describe implementations. Of particular interest are attempts to define the notions of a *mode*, a *modality*, and a *medium* of communication—such as those by Maybury and Lee, Teil and Beluk, and Taylor and Waugh. Such terms are used to distinguish among "manners" or "ways" of communicating, and part of the difficulty in defining them (evidenced in this volume by a lack of consensus) is that their meanings are indexical—their definitions depend upon an underlying theory (or at least model) of communication. One such underlying theory of choice in this volume is Layered Protocol Theory, which is distinctly information-theoretic in flavor (unfortunately, the description of this theory does not appear until chapter 25 of the 28 chapters). Another possible underlying theory, which is not explicitly adopted here, is proposed by Allwood in the introductory material (and is described in more detail in Allwood [1995]). Speech Act Theory receives scant attention.

Only a subset of the papers take on the topic of dialogue structure that is suggested by the title *The Structure of Multimodal Dialogue II*. Moreover, the editors' caveat that the collection is intended to inspire the interaction of cross-disciplinary ideas cannot excuse the poor quality of certain papers. This volume is certainly not a must-have, but some readers might find certain papers a complement to an existing collection of research literature concerned with the use of multiple modes of communication in collaborative domains.—*Melanie A. Baljko, University of Toronto*

1 When referenced in the research literature, the workshop is often confusingly referred to as the "Second Venaco Workshop," after the first workshop held in Venaco, Corsica, in 1989; the follow-up publication from that workshop is Taylor, Néel, and Bouwhuis (1989).

References

Allwood, Jens. 1995. An activity based approach to pragmatics. Gothenburg Papers in Theoretical Linguistics 76, University of Göteborg, Department of Linguistics.

Cassell, Justine, Mark Steedman, Norm Badler, Catherine Pelachaud, Matthew Stone, Brett Douville, Scott Prevost, and Brett Achorn. 1994. Modeling the interaction between speech and gesture. In *Proceedings of the 16th Annual Conference of the Cognitive Science Society*, Georgia Institute of Technology, Atlanta, GA.

Nickerson, Raymond S. 1977. On conversational interaction with computers. In *User-Oriented Design of Interactive Graphic Systems*. ACM, New York, pages 101–113. Reprinted in Ronald M. Baecker and William A. S. Buxton, editors, *Readings in Human-Computer Interaction: A Multidisciplinary Approach*. Morgan Kaufmann, Los Altos, CA, pages 681–693.

Taylor, M. Martin, Françoise Néel, and Don G. Bouwhuis. 1989. *The Structure of Multimodal Dialogue*. Elsevier Science Publishers, North Holland.

Handbook of Natural Language Processing

Robert Dale, Hermann Moisl, and Harold Somers (editors)
(Macquarie University, University of Newcastle, and UMIST)

New York: Marcel Dekker, Inc., 2000, xviii+943 pp; hardbound, ISBN 0-8247-9000-6, $195.00

"Comprehensive in scope, this up-to-date handbook thoroughly explores the design and application of natural language text-based processing systems based on generative linguistics, empirical corpus analysis, and artificial neural networks—emphasizing the design and implementation of the language input/output components of computational systems for increased fluency and flexibility.

"Adopting a historically based structure to the approaches of NLP, each self-contained section of the [book] provides an introductory overview of the approach discussed, details of fundamental concepts and procedures appropriate to the approach, and specific applications in which the approach has been used successfully."—*From the publisher's announcement*

The contents of the volume are as follows:

Part I: Symbolic approaches

"Symbolic approaches to natural language processing" by Robert Dale
"Tokenisation and sentence segmentation" by David D. Palmer
"Lexical analysis" by Richard Sproat
"Parsing techniques" by Christer Samuelsson and Mats Wirén
"Semantic analysis" by Massimo Poesio
"Discourse structure and intention recognition" by Karen E. Lochbaum, Barbara J. Grosz, and Candace L. Sidner
"Natural language generation" by David D. McDonald
"Intelligent writing assistance" by George E. Heidorn
"Database interfaces" by Ion Androutsopoulos and Graeme Ritchie
"Information extraction" by Jim Cowie and Yorick Wilks
"The generation of reports from databases" by Richard I. Kittredge and Alain Polguère
"The generation of multimedia presentations" by Elisabeth André
"Machine translation" by Harold Somers
"Dialogue systems: From theory to practice in TRAINS-96" by James Allen, George Ferguson, Bradford W. Miller, Eric K. Ringger, and Teresa Sikorski Zollo

Part II: Empirical approaches

"Empirical approaches to natural language processing" by Harold Somers
"Corpus creation for data-intensive linguistics" by Henry S. Thompson
"Part-of-speech tagging" by Eric Brill
"Alignment" by Dekai Wu
"Contextual word similarity" by Ido Dagan
"Computing similarity" by Ludovic Lebart and Martin Rajman
"Collocations" by Kathleen R. McKeown and Dragomir R. Radev
"Statistical parsing" by John A. Carroll
"Authorship identification and computational stylometry" by Tony McEnery and Michael Oakes
"Lexical knowledge acquisition" by Yuji Matsumoto and Takehito Utsuro
"Example-based machine translation" by Harold Somers
"Word-sense disambiguation" by David Yarowsky

Part III: Artificial neural network approaches

"NLP based on artificial neural networks: Introduction" by Herman Moisl
"Knowledge representation" by Simon Haykin

"Grammar inference, automata induction, and language acquisition" by Rajesh G. Parekh and Vasant Honavar
"The symbolic approach to ANN-based natural language processing" by Michael Witbrock
"The subsymbolic approach to ANN-based natural language processing" by Georg Dorffner
"The hybrid approach to ANN-based natural language processing" by Stefan Wermter
"Character recognition with syntactic neural networks" by Simon Lucas
"Compressing texts with neural nets" by Jürgen Schmidhuber and Stefan Heil
"Neural architectures for information retrieval and database query" by Chun-Hsien Chen and Vasant Honavar
"Text data mining" by Dieter Merkl
"Text and discourse understanding: The DISCERN system" by Risto Miikkulainen

Where Mathematics, Computer Science, Linguistics, and Biology Meet: Essays in Honour of Gheorghe Păun

Carlos Martín-Vide and Victor Mitrana (editors)
(Rovira i Virgili University and University of Bucharest)

Dordrecht: Kluwer Academic Publishers, 2001, xv+446 pp; hardbound, ISBN 0-7923-6693-X, $176.00, £112.00, Dfl 360.00

"There are not many scientific fields as interdisciplinary as formal language theory. In this volume, it is presented as the very intersection point of Mathematics, Computer Science, Linguistics, and Biology. This book is a collection of papers which closely examines classical topics in computer science inspired by formal languages, as well as showing new concepts and problems motivated in linguistics and biology. The papers are organized into four sections: Grammars and Grammar Systems, Automata, Languages and Combinatorics, and Models of Molecular Computing. They clearly prove the power, wealth, and vitality of the theory nowadays and sketch some trends for its future development. The volume is intended for an audience of computer scientists, computational linguists, theoretical biologists, and any other people interested in dealing with the problems and challenges of interdisciplinarity."—*From the publisher's announcement, with minor corrections*

"Our volume has two goals. One is to present some recent results in active areas of the three domains that converge in the new field. The other one is to celebrate the 50th birthday of Gheorghe Păun, who, from formal language theory, promoted the new research area and made seminal contributions to it.... All the papers are contributed by Gheorghe Păun's collaborators, colleagues, friends, and students in the five continents, who wanted to show in this way their recognition to him for his tremendous work. We have collected 38 papers by 75 authors here. (Another set of 38 papers by 65 authors will be published soon in the future.)"—*From the editors' preface*

Recent Advances in Natural Language Processing II: Selected Papers from RANLP '97

Nicolas Nicolov and Ruslan Mitkov (editors)
(University of Sussex and University of Wolverhampton)

Amsterdam: John Benjamins (Current issues in linguistic theory, volume 189), 2000, xi+422 pp; hardbound, ISBN 1-55619-966-X and 90-272-3695-X, $84.00

"This volume brings together [31] revised versions of a selection of papers presented at the Second International Conference on 'Recent Advances in Natural Language Processing' (RANLP'97) held in Tzigov Chark, Bulgaria, 11–13 September 1997."—*From the editors' foreword*

Intelligent Help Systems for UNIX

Stephen J. Hegner, Paul McKevitt, Peter Norvig, and Robert Wilensky (editors)
(Umeå University, University of Ulster, NASA Ames Research Center, and University of California, Berkeley)

Reprinted from *Artificial Intelligence Review*, 14(1–5), 2000.
Dordrecht: Kluwer Academic Publishers, 2001, xii+420 pp (no index); hardbound, ISBN 0-7923-6641-7, $190.00, £135.00, €220.00

This collection of papers concerns artificial-intelligence (AI) and cognitive-science techniques applied to the problem of providing help systems for the UNIX operating sys-

tem. The research described here involves the representation of technical computer concepts, but also the representation of how users conceptualize such concepts. These systems range from menu-based to natural language interfaces, some providing active help, intervening when they believe the user to have misconceptions, and some based on empirical studies of what users actually do while using UNIX. Further papers investigate planning and knowledge representation where the focus is on discovering what the user wants to do, and figuring out a way to do it as well as representing the knowledge needed to do so. There is a focus on natural language dialogue where consultation systems can become active, incorporating user modeling, natural language generation, and plan recognition, modeling metaphors and users' mistaken beliefs.

The articles are derived from papers originally presented at a workshop entitled "Knowledge Representation in the UNIX Help Domain," organized by Peter Norvig, Wolfgang Wahlster, and Robert Wilensky at the University of California, Berkeley, USA, in December 1987. The area of intelligent help systems for UNIX provides such a fruitful example domain of application for many AI techniques that this work is still timely, more widely and particularly now where we have many spoken dialogue systems applied to such fixed domains. Each article here has been reviewed by the editors and has been subsequently revised; furthermore, all authors have been asked to include a section on recent developments in their work.—*Adapted from the publisher's announcement and the editors' introduction*