NEW REVIEWERS FOR COMPUTING REVIEWS WANTED

Now that Computing Reviews is close to having an adequately automated data base, I am anxious to greatly increase and broaden the base of reviewers. SIG members in particular are being actively approached via this notice. Computing professionals who serve as reviewers for CR have a unique method of improving the whole field through their reviews which are read by the computing community.

There is a brochure available from aCM Headquarters containing the full new 1982 category system, the index, the mapping from the old category system to the new one, and the Reviewer Information Form. I know that the latter is detailed to fill out, but accurate information on it will enable us to make good matches between your interests and the item to be reviewed. This brochure has been sent to many different groups of people. However, anyone who has not received a copy and is interested in applying to become a reviewer can either examine the January 1982 issue of Computing Reviews, or fill out the form below and send it to ACM Headquarters.

Jean E. Sammet
Editor-in-Chief

Send your name and address to:

ACM Headquarters
CR Brochure
11 West 42 Street
New York, NY 10036

to receive more detailed information.

Name:
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SIG

BOOKS

PLANNING AND UNDERSTANDING
A Computational Approach to Human Reasoning

Robert Wilensky
University of California
Berkeley, California

This book, representing original research in the areas of Artificial Intelligence and Natural Language Processing, brings together two areas of cognition: common sense problem solving, and natural language understanding. To do so, three theories are presented: a theory of plan generation, a theory of plan-based understanding, and a theory of the structure of plans that underlies both theories of processing. This research had led to the development of several computer programs, including PAM (Plan Applier Mechanism), a story understanding systems, and PANDORA (Plan Analysis with Dynamic Organization, Revision, and Application). In particular, the theories and programs described in the book are unique in that they attempt to relate artificial intelligence and natural language processing in a new way. The theory stresses the complexity of the structure of plans rather than the problem of searching for the solution in a problem space. In addition, the theory examines commonplace situations rather than esoteric ones, goal interactions as opposed to plan production, and simulation and goal detection in place of more conventional bug detection and plan modification techniques. The treatment of these topics presumes that the audience has some degree of sophistication in matters relating to Artificial Intelligence and Cognitive Science. However, since very little specific knowledge is required, it should be readable by any cognitive scientist or AI researcher even without technical expertise in Natural Language Processing or AI planning.

Contents

Addison-Wesley Publishing Co., Inc.
Publication Date: November 1982
©1983, approx. 200 pp. illus.
Hardbound ISBN 0-201-09590-4
$25.00

Languages as a Cognitive Process Volume 1: Syntax Terry Winograd Stanford University

This textbook introduces a computational approach to the structure of human language. It presents a number of major linguistic theories within a cognitive computational framework. The fundamental ideas of computation are presented as they apply to language processing, and all of the prominent current approaches to syntax are explained within the framework (including transformational grammar, augmented transition networks, systemic grammar, case grammar, functional grammars and generalized phrase structure grammars.) The ideas are developed step-by-step, so students with no previous linguistic background can learn all of the relevant ideas through the text and exercises. There is also a survey of the existing computer systems for parsing natural language and an outline of English syntax.

The major theme of the book is that the structure of language can be best understood by seeing it as the result of a cognitive process' - a computational being carried out by a speaker/hearer of the language, making use of a body of stored knowledge about the language. This general perspective is used to integrate a wide variety of linguistic theories.

Contents

Viewing Language as a Knowledge-based Process•Word Pattern and Word Classes•Context-free Grammars and Parsing•Transformational Grammar• Augmented Transition Network Grammars•Feature and Function Grammars•Computer Systems for Natural Language Parsing•Appendices•Bibliography• Indices

Addison-Wesley Publishing Co.,Inc.
1982, 654 pp., illus.
Hardbound ISBN 0-201-08571-2
$27.95

Belief System Representations in Artificial Intelligence: A Validation Based on Linguistic Theories of Implicit Utterances Katharina Morik (In German)

This interdisciplinary study examines the influence of subjective knowledge on linguistic phenomena and presents criteria for validating Artificial Intelligence belief systems in terms of their ability to represent such knowledge.

Problems traditionally associated with the considerations of world knowledge within linguistic theory may be accounted for in part by the lack of suitable means of representing this knowledge. In order to use the concepts of techniques of knowledge representation offered by Artificial Intelligence for the scientific study of language and language use, it is necessary to show their validity.

Through the examination of implicit utterances, this work shows in which theoretical contexts world knowledge must be postulated and which properties are to be associated to it in order to handle phenomena such as presuppositions, coherency, and the recognition of indirect speech acts adequately. Subjectivity is pointed out as an essential characteristic of non-encyclopedic world knowledge. For further characterization of subjective world knowledge corresponding psychological studies are referred to. Thus, requirements for knowledge representation systems are drawn from the examination of linguistic phenomena, and in addition plausibility for these requirements is supported by consideration of psychological studies.

Artificial Intelligence representation of belief systems is comprehensively described as the conceptualization of subjective knowledge and evaluated accordingly. The evaluation criteria given poses a verification context that extends beyond Artificial Intelligence. Weaknesses of existing systems as well as the possibility of linguistic verification of belief systems can be demonstrated.

Tubingen: Niemeyer Verlag
ISBN 3-484-31905-4
269 pp.

BOOK REVIEW

The Handbook of Artificial Intelligence Volume 2 A. Barr & E.A. Feigenbaum, eds. Volume 3 P.R. Cohen & E.A. Feigenbaum, eds.

Reviewed by:
Keith Price

The Handbook of Artificial Intelligence, Volumes 2 and 3, continue the work started in Volume 1 (see review in **SIGART #81, July 1982**). Volume 2 primarily covers applications oriented work (expert systems) with chapters on programming languages and automatic programming. Volume 3 contains a long chapter on vision and shorter chapters on learning, theorem proving, planning and models of cognition.

These 3 books are an attempt to review all areas of AI research and to provide a starting reference for researchers starting in AI and those already in the field. All survey books are dated by the time they are published and these are no exception. The bibliography is extensive, but there are few references after 1980. Volume 3 contains a complete index for all three volumes.