

# CONTENTS

<i>Foreword</i>	ix
<i>Preface</i>	xi
<b>Chapter 1 Introduction</b>	<b>1</b>
<b>Chapter 2 Information Retrieval Background</b>	<b>9</b>
Computers in Information Retrieval	10
Mechanized Documentation since 1965	11
Aspects of Mechanization	12
Key Questions	15
Relevance of Linguistics	17
Experiments in Information Retrieval	18
Experimental Methodology	21
Performance Measures	22
Current State of Experiments	24
Information Retrieval Models	26
Recent Developments	27
Present State of Play	29
<b>Chapter 3 Linguistics</b>	<b>31</b>
Theoretical Linguistics	31
Views of Grammar	34

Components of Grammars	36
Computational Linguistics	39
ALPAC Findings	41
Contributions to Information Science	43
<b>Chapter 4 Language in Documentation</b>	<b>45</b>
Linguistic Components of Information Retrieval Systems	45
Natural and Indexing Languages	46
Input Texts and Index Descriptions	47
Linguistic Problems	50
Units of Input and Description	51
Information Retrieval Needs and Linguistic Solutions	53
Analysis, Description, and Searching	54
Strong and Weak Approaches	56
Linguistic Implications	60
Available Linguistic Tools	60
Characteristics of Indexing Languages: Coyaud	63
Some Examples	65
Specification and Classification in Indexing Languages: Sharp	70
Postcoordination	74
Relations in Indexing Languages: Šreider <i>et al.</i>	76
<b>Chapter 5 Syntax</b>	<b>79</b>
Syntax in Natural Language	79
Phrase Structure and Dependency	81
Automatic Phrase-Structure Analysis	85
Parsing Strategies	87
Transformational Grammar	91
Form of Deep Structures	95
Transformational Parsing	97
Approaches Emphasizing Rule Form	97
Approaches Emphasizing the Deep-Surface Distinction	99
Syntax in Information Retrieval	103
Input Text Syntax	105
Partial Parsing	106
Statistical Syntax	110
Exploiting Syntactic Information	111
Index Description Syntax	112
Postcoordinate Syntax	113
Syntax in Searching	114

The SYNTOL Project	115
Syntax in Information Retrieval: Conclusion	118

## Chapter 6 **Semantics** 120

Semantics in Natural Language	120
Semantic Notation	121
Semantic Component of a Transformational Grammar	123
Semantic Aspects of Information Retrieval	125
Semantic Input Analysis	128
Derivative and Assignment Indexing	129
Extraction Procedures	131
Statistical Extraction	134
Statistical Extraction: Conclusion	137
Semantic Indexing Procedures	139
Keyword Normalization	141
Term Assignment	141
Indexing for Substitution and Expansion	143
Term Weighting	146
Index Languages	148
Dictionary, Thesaurus, Classification	149
Vocabulary Formation	151
Vocabulary Requirements	152
Automatic Dictionary Formation	155
Index Language Classification	156
Automatic Term Classifications	159
Classification Base	162
Classification Procedures	163
Term Associations	164
Term Structures	165
Experiments with Automatic Term Structures	166
Value of Automatic Term Structures	168
Semantics in Searching	170
Automatic Classification in Linguistics	171
Semantics in Information Retrieval: Conclusion	173

## Chapter 7 **Fact Retrieval** 174

Fact Retrieval and Document Retrieval	174
Early Systems	177
Semantic Networks	182
Theorem Proving and Fact Retrieval	189

Chapter 8	<b>Conclusion</b>	195
	<b>References</b>	201
	<i>Author Index</i>	227
	<i>Subject Index</i>	234