

# CONTENTS

INTRODUCTION	1
SENSING	4
The visual transduction process	5
The nature of the photon stream	6
The role of individual light quantum in seeing	9
Seeing color	22
The auditory transduction process	26
The neural code	28
Signaling intensity	31
RECOGNIZING PATTERNS	39
Physiological evidence	41
Artificial systems	51
Temporal process—the icon	53
Information accural	61
A model	65
Contextual effects	76
Contextual effects on recognizing alphabetic strings	79
Processing visual scenes	88
Speech perception	92
Attentional phenomena	95
Summary	100
	vii

UNDERSTANDING LANGUAGE	102
The hearsay system	103
Example	107
The role of syntax in language understanding	116
The augmented transition network as a model of the syntactic component	117
The ATN and comprehension difficulty	123
Garden path sentences and the ATN analysis	127
An ATN model of relative clause processing	130
Expectancy and the ATN model	135
ATN and the hearsay system	137
The role of semantics in language understanding	146
The role of context in language understanding	153
The Bransford and Johnson experiments	153
The problem of reference	157
Conversational postulates	163
Schema theory of comprehension	164
Summary	169
REMEMBERING	171
The nature of primary memory activations	172
Access of information in primary memory: how long	173
Storage limitations	176
The nature of primary memory activation	181
Confusion errors	181
Interference effects	181
Scanning experiments	182
Generation and manipulation of memory activations	187
Maintaining primary memory activations	195
Summary	201
The nature of secondary memory	202
Secondary memory is structured	204
Depth of processing	213
Contextual effects in remembering	215
Retrieving from secondary memory	217
The structure of secondary memory	221
Summary	235

REASONING	237
Analogical reasoning	238
Functional reasoning	248
Solving problems	250
The general problem solver	254
The hobbits and the orcs problem	256
The role of expectations on problem solving	260
Summary	265
REFERENCES	266
GLOSSARY	276
ILLUSTRATION CREDITS	295
INDEX	301