CONTENTS

PREFACE xi

INTRODUCTION 1

PART 1 THE CORRESPONDENCE PROBLEM 8

CHAPTER 1 THE BASIC ELEMENTS PROBLEM 11
- 1.1 Theoretical Considerations 11
- 1.2 The Correspondence is not a Grey Level Operation 15
- 1.3 The Correspondence Tokens are not Structured Forms 20

CHAPTER 2 THE CORRESPONDENCE PROCESS 29
- 2.1 The General Scheme 29
- 2.2 Affinity 35
- 2.3 Higher Order Interactions 47
- 2.4 Application of the Competition Scheme to Examples 53
- 2.5 Affinity and Three Dimensional Interpretation 69
- 2.6 A Possible Application to Object Concept Incipiency 76

CHAPTER 3 THE MINIMAL MAPING THEORY OF MOTION CORRESPONDENCE 82
- 3.1 Introduction 82
- 3.2 The Optimal (Independent) Correspondence Strategy 83
- 3.3 Computational Feasibility 87
- 3.4 Computing the Minimal Mapping by a Simple Network 90
- 3.5 Preference for One-to-one Mappings 97
- 3.6 Properties of the Minimal Mapping 102
- 3.7 The Experimental Determination of q(v) 120
- 3.8 Extensions 123
- 3.9 On the Relations Between Chapters 2 and 3 128

PART II THREE-DIMENSIONAL INTERPRETATION 130

CHAPTER 4 THE INTERPRETATION OF STRUCTURE FORM MOTION 130
- 4.1 Structure from Parallel Projection 133
- 4.2 Criticism of Past Approaches 137
- 4.3 Reflective Constraints 142
- 4.4 The Structure from Motion Interpretation Scheme 145
- 4.5 The Perspective Case 153
- 4.6 Psychological Relevance 170

CHAPTER 5 THE PERCEPTION OF MOTION FROM STRUCTURE 176
5.1 The M.f.S Interpretation Scheme 177
5.2 Ames Phenomena and the Rivalry Between the S.f.M and the M.f.S Schemes 184

EPILOGUE 192

Appendix 1 The Structure form Motion Theorem 193

Appendix 2 Structure from Perspective Projections 199

FOOTNOTES 207

REFERENCES 216

INDEX 227