

contents

<i>Preface</i>	1
I. INTRODUCTION	5
1 Terminology	12
1.1 Body-related Behavior	12
1.2 Body-related Models	15
1.3 Body-related Similarity	17
2 Objectives	19
3 Contributions	21
3.1 Human Pose Estimation	22
3.2 Human Pose Retrieval	24
4 Outline	26
II. BODY-RELATED MODELS	29
1 Scholarly Approach	32
2 Point-based Models	35
2.1 Implicit Modeling of Relational Constraints	35
2.2 Explicit Modeling of Relational Constraints	41
3 Line-based Models	52
4 Plane-based Models	58

III. THE POSES OF PEOPLE IN ART DATA SET	69
1 Related Work	72
2 Collection Procedure	76
3 Annotation Principles	81
3.1 Exhaustiveness Criterion	82
3.2 Consistency Criterion	83
3.3 Accuracy Criterion	87
4 Annotation Interface	87
5 Descriptive Statistics	89
6 Data Split Format	92
7 Applications	92
IV. SEMI-SUPERVISED HUMAN POSE ESTIMATION	99
1 Related Work	101
1.1 Strategies for Human Pose Estimation	103
1.2 Human Pose Estimation in Art History	107
2 Methodology	109
2.1 Transformer-based Detection	109
2.2 Semi-supervised Domain Adaptation	113
3 Data Sets	116
4 Evaluation	118
4.1 Ablation Studies	118
4.2 Qualitative Analysis	122
V. VIEW-INVARIANT HUMAN POSE RETRIEVAL	127
1 Related Work	129
1.1 Strategies for Human Pose Retrieval	130
1.2 Strategies for Human Pose Classification	133
2 Methodology	136
2.1 View-invariant Human Pose Embedding	136
2.2 One-shot Human Pose Classification	140
3 Data Set	143
4 Evaluation	146
4.1 Filtering Process	147
4.2 Quantitative Analysis	152
4.3 Qualitative Analysis	156

VI. APPLICATION SCENARIOS	169
1 Analytical Process	171
2 The Crucified in Christian Iconography	173
2.1 Aggregate Level	174
2.2 Individual Level	181
3 The Iconography of the Fall of Man	183
3.1 Aggregate Level	185
3.2 Individual Level	189
VII. CONCLUSIONS	195
1 Answers to the Research Questions	198
2 Limitations and Future Work	201
2.1 Human Pose Estimation	202
2.2 Human Pose Classification	203
<i>Acknowledgments</i>	205
<i>List of Tables</i>	207
<i>List of Figures</i>	211
<i>List of Notations</i>	223
<i>List of Abbreviations</i>	225
<i>Appendix</i>	227
<i>Bibliography</i>	245