

# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1	Motivations . . . . .	1
2	Overview . . . . .	2
3	Contributions . . . . .	4
4	Structure . . . . .	5
<b>2</b>	<b>Creativity</b>	<b>7</b>
1	Creativity theories . . . . .	7
1.1	Divergent Production . . . . .	8
1.2	Bisociation . . . . .	14
1.2.1	Humor . . . . .	15
1.2.2	Science . . . . .	16
1.2.3	Arts . . . . .	17
1.3	The Systems Model . . . . .	19
1.4	Boden's taxonomies . . . . .	23
1.5	Others . . . . .	26
1.6	Synthesis . . . . .	29
2	Computational Creativity . . . . .	30
2.1	Two accounts for characterizing Creativity . . . . .	30
2.1.1	Characterizing Creativity in AI . . . . .	31
2.1.2	Creativity assessment . . . . .	32
2.2	Creative systems . . . . .	36
2.2.1	What is a creative system? . . . . .	36
2.2.2	Some systems and models . . . . .	38
<b>3</b>	<b>Working with Concepts</b>	<b>47</b>
1	What is a concept? . . . . .	47
2	Building concepts . . . . .	49
2.1	Concept Formation . . . . .	49
2.2	Concept Invention . . . . .	50
3	Mixing concepts . . . . .	51
3.1	Conceptual Combination . . . . .	51
3.2	Conceptual Blending . . . . .	53

3.2.1	The Framework . . . . .	55
3.2.2	Some criticisms . . . . .	66
4	Metaphor and Analogy . . . . .	68
4.1	Structure Mapping Engine . . . . .	69
4.2	Conceptual Scaffolding and Sapper . . . . .	71
4.3	Others . . . . .	79
<b>4</b>	<b>A Model of Concept Invention</b>	<b>85</b>
1	A Creative General Problem Solver . . . . .	85
2	Description of the model . . . . .	89
3	Discussion . . . . .	96
<b>5</b>	<b>Divago</b>	<b>101</b>
1	Overview of the architecture . . . . .	101
2	Knowledge Base . . . . .	103
3	Mapper . . . . .	115
4	Blender . . . . .	117
5	Factory . . . . .	122
6	Constraints . . . . .	126
6.1	Integration . . . . .	127
6.2	Topology . . . . .	130
6.3	Pattern Completion . . . . .	131
6.4	Maximization/Intensification of Vital Relations . . . . .	132
6.5	Unpacking . . . . .	133
6.6	Web . . . . .	135
6.7	Relevance . . . . .	136
7	Elaboration . . . . .	136
8	Divago as a creative system . . . . .	140
<b>6</b>	<b>Experiments</b>	<b>141</b>
1	The Boat-House . . . . .	142
2	The Horse-Bird . . . . .	149
2.1	Evaluating the Optimality Pressures . . . . .	151
2.2	Finding the Pegasus . . . . .	154
3	Noun-Noun combinations . . . . .	161
3.1	Tuning . . . . .	164
3.2	Free generation . . . . .	166
3.3	Comparison to $\mathcal{E}^3$ . . . . .	171

4	The creature generation experiment . . . . .	173
4.1	Tuning . . . . .	174
4.2	Free generation . . . . .	178
5	The established Blending examples . . . . .	184
5.1	Experiments with isolated principles . . . . .	187
5.2	Experiments with combination of principles . . . . .	194
5.3	Some considerations . . . . .	196
6	Discussion . . . . .	198
<b>7</b>	<b>Conclusions and Future Directions</b>	<b>205</b>
<b>A</b>	<b>The effect of input knowledge</b>	<b>211</b>
<b>B</b>	<b>Established examples of Conceptual Blending</b>	<b>213</b>
<b>C</b>	<b>Programming the Frames</b>	<b>223</b>
1	Syntax and Overview . . . . .	223
2	Programming of the frames . . . . .	223
3	Examples . . . . .	225
<b>D</b>	<b>Instances in the house-boat experiment</b>	<b>231</b>
<b>E</b>	<b>Experiments, Databases and other documents</b>	<b>233</b>
	<b>Notes</b>	<b>235</b>
	<b>Bibliography</b>	<b>239</b>
	<b>Index</b>	<b>250</b>