

# Contents

<b>1</b>	<b>Introduction</b> . . . . .	1
	References . . . . .	3
<b>2</b>	<b>Review</b> . . . . .	5
	References . . . . .	8
<b>3</b>	<b>Methodology</b> . . . . .	11
3.1	Overview . . . . .	11
3.2	The DSNS Approach Explained. . . . .	12
3.3	Using Different Domains . . . . .	16
3.4	Using Strings of Different Length . . . . .	17
3.5	Assumptions and Implications . . . . .	18
	References . . . . .	19
<b>4</b>	<b>Experimental Work</b> . . . . .	21
4.1	The Domain of Investigation . . . . .	21
4.2	The Experimental Tool . . . . .	23
4.3	The First Experiment: Same Domain . . . . .	24
4.4	The Second Experiment: Different Domains . . . . .	28
4.5	The Third Experiment: Variations in the Number of Objects and Attributes . . . . .	33
4.6	The Fourth Experiment: Human Expert Assessment . . . . .	36
4.7	The Fifth Experiment: Comparing TG1500p and Comp3.5 . . . .	39
4.8	The Sixth Experiment: Comparisons Against the State-of-the-Art. . . . .	40
4.9	Human Versus Computer Composition . . . . .	42
	References . . . . .	43
<b>5</b>	<b>Consolidation of Results</b> . . . . .	45
5.1	General Findings . . . . .	45
5.1.1	On the DSNS . . . . .	45
5.1.2	Extended Findings . . . . .	46

5.2	Limitations of the DSNS and Its Possible Application in Other Domains . . . . .	47
<b>6</b>	<b>Conclusions . . . . .</b>	<b>49</b>
	<b>Appendix A: Chess Problem Composing Steps. . . . .</b>	<b>51</b>
	<b>Appendix B: Two Columns of DSNS Strings in a Spreadsheet . . . . .</b>	<b>55</b>
	<b>Appendix C: The 90 DSNS-Generated Compositions Evaluated by the Human Experts . . . . .</b>	<b>65</b>
	<b>Appendix D: The Human Expert Evaluations of the 90 DSNS-Generated Compositions . . . . .</b>	<b>69</b>
	<b>Appendix E: Unedited Expert Commentary on the DSNS-Generated Problems . . . . .</b>	<b>73</b>
	<b>Appendix F: Unedited Microsoft Visual Basic 6 Source Code of Chesthetica v9.95's Composing Subroutine. . . . .</b>	<b>87</b>
	<b>Index . . . . .</b>	<b>119</b>

The Digital Synaptic Neural Substrate

A New Approach to Computational Creativity

Iqbal, A.; Guid, M.; Colton, S.; Krivec, J.; Azman, S.;

Haghighi, B.

2016, XV, 119 p. 13 illus., 4 illus. in color., Softcover

ISBN: 978-3-319-28078-3