

Contents

| | |
|---|----|
| 1 Introduction | 1 |
| References | 3 |
| 2 Review | 5 |
| References | 8 |
| 3 Methodology | 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 |
| 4 Experimental Work | 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 |
| 5 Consolidation of Results | 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

6 Conclusions 49

Appendix A: Chess Problem Composing Steps. 51

Appendix B: Two Columns of DSNS Strings in a Spreadsheet 55

**Appendix C: The 90 DSNS-Generated Compositions Evaluated
by the Human Experts 65**

**Appendix D: The Human Expert Evaluations of the 90
DSNS-Generated Compositions 69**

**Appendix E: Unedited Expert Commentary on the DSNS-Generated
Problems 73**

**Appendix F: Unedited Microsoft Visual Basic 6 Source Code
of Chesthetica v9.95's Composing Subroutine. 87**

Index 119



<http://www.springer.com/978-3-319-28078-3>

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