

List of Figures

Figure 1. Addressing by indexing [Brooksheat, 2012]	22
Figure 2. Addressing by natural language order [Auge, 1909]	23
Figure 3. B-tree	24
Figure 4. Natural Language Addressing in a spreadsheet	25
Figure 5. Example of multi-way trie [Pfenning, 2012]	38
Figure 6. The 31 most common English words [Liang, 1983].....	39
Figure 7. Linked trie for the 31 most common English words [Liang, 1983].....	39
Figure 8. Trie for the elements of Table 1 [Sahni, 2005]	40
Figure 9. Burst trie with BSTs used in containers [Heinz et al, 2002].....	42
Figure 10. Evolutionary scheme of DB-models [Angles & Gutierrez, 2008].....	45
Figure 11. Genesis of the Access Methods and their modifications extended variant of [Gaede & Günther, 1998; Mokbel et al, 2003] presented in [Markov et al, 2008].....	49
Figure 12. Running example: the toy genealogy	55
Figure 13. RDF triple	63
Figure 14. Normalized triple store	68
Figure 15. RDF Hybrid schema (the table-per-property approach)	70
Figure 16. Illustration of Königsberg bridge problem [Euler, 1736]	73
Figure 17. Labeled graphs	74
Figure 18. A sample graph	75
Figure 19. Example of location A=(66,101,101,114)	88
Figure 20. Example of natural language path A=(Beer)	89
Figure 21. Example of content located by path “Beer”	89
Figure 22. Final variant of the sample graph.....	93
Figure 23. Word Length for English (extracted from [Sigurd et al, 2004])	97

Figure 24. Time in milliseconds for writing in text file and NL-ArM archive	98
Figure 25. Time correlation between text file and NL-ArM for writing	99
Figure 26. Size in bytes of the text file and the NL-ArM archive	101
Figure 27. Relation between text file and NL-ArM for writing	102
Figure 28. Time in miliseconds for writing by Firebird and NL-ArM	106
Figure 29. Time relation for writing by Firebird and NL-ArM	106
Figure 30. Logarithmic time relation for writing	107
Figure 31. Ratios for NL-ArM row and column oriented writing	109
Figure 32. Ratios for the offset from 1 to 1000000	110
Figure 33. Time in milliseconds (ms) for reading by Firebird and NL-ArM	112
Figure 34. Time relation for reading by Firebird and NL-ArM	112
Figure 35. A simple ontology	116
Figure 36. Logical structure of the WordNet	121
Figure 37. Answer by WordNet system to a query for the word "accession"	122
Figure 38. Synsets of the word "accession" in WordNet data file for nouns	123
Figure 39. Synsets of the word "accession" in WordNet data file for verbs	123
Figure 40. Record for the word "accession" in the index of nouns	124
Figure 41. Record for the word "accession" in the index of verbs	124
Figure 42. Records for the word "accession" in the sense index	124
Figure 43. Synset the word "accession" from the data file for nouns	126
Figure 44. WordNet and NL-versions of the synset of the word "accession"	129
Figure 45. WordArM results for the case of WordNet as thesaurus	129
Figure 46. OntoArM results for the case of WordNet with 45 layers	142
Figure 47. OntoArM panel for manual querying words cut and CUT	142
Figure 48. OntoArM report to query from Figure 47 a)	143
Figure 49. OntoArM panel for manual updating definitions	147
Figure 50. Illustration of the experimental storing algorithm	155
Figure 51. Interrelations between computer configurations	161
Figure 52. Screenshot of the report of RDFArM for BSBM 50K	170
Figure 53. Benchmark results for BSBM 50K	170

Figure 54. Screenshot of the report of RDFArM for homepages-fixed.nt	171
Figure 55. Benchmark results for homepages-fixed.nt	172
Figure 56. Screenshot of the report of RDFArM for BSBM 250K	173
Figure 57. Benchmark results for BSBM 250K	174
Figure 58. Screenshot of the report of RDFArM for geocoordinates-fixed.nt	175
Figure 59. Benchmark results for geocoordinates-fixed.nt	176
Figure 60. Screenshot of the report of RDFArM for BSBM 1M	177
Figure 61. Benchmark results for BSBM 1M	179
Figure 62. Screenshot of the report of RDFArM for BSBM 5M	179
Figure 63. Benchmark results for BSBM 5M	182
Figure 64. Screenshot of the report of RDFArM for infoboxes-fixed.nt	184
Figure 65. Benchmark results for infoboxes-fixed.nt	185
Figure 66. Screenshot of the report of RDFArM for BSBM 25M	186
Figure 67. Benchmark results for BSBM 25M	187
Figure 68. Screenshot of the report of RDFArM for BSBM 100M	188
Figure 69. Benchmark results for BSBM 100M	189
Figure 70. Benchmark results for BSBM 100M and 200M on Configuration C	190
Figure 71. Visualization of Nemenyi test results	198
Figure 72. A screenshot from the RDFArM program	201
Figure 73. Storing time for one instance of BSBM 250K	202
Figure 74. Storing time for one instance of BSBM 1M	202
Figure 75. Storing time for one instance of BSBM 25M	202
Figure 76. Storing time for one instance of BSBM 100M	203
Figure 77. Comparison of time used by processors for BSBM 25M	203
Figure 78. Comparison of time used by processors for BSBM 100M	203
Figure 79. Comparison of log n and average time in ms for storing one triple from BSBM 100M.....	204
Figure 80. The OntoPop's platform [Amardeilh, 2006]	212
Figure 81. Information model of ICON	215
Figure 82. Taxonomy of ICON internal information resources	218

Figure 83. Using OntoArM for storing ontologies of text documents (following [Witte et al, 2010]).....	220
Figure 84. Illustration of Collect/Report Paradigm via example of Bingo game	225
Figure 85. Cloud Collect/Report Scheme for Storing and Accessing Big Data.....	228
Figure 86. The front panel of system INFOs	235
Figure 87. The WordArM panel for working in automated mode	237
Figure 88. Content of WordArM input file with two informative lines	237
Figure 89. Content of WordArM output file with two informative lines	238
Figure 90. The WordArM panel for working in manual mode	239
Figure 91. Manual input of the concept and its definition.....	240
Figure 92. Manual output of the concept and its definition.....	240
Figure 93. Simultaneous work with concepts defined in different languages.....	241
Figure 94. Content of OntoArM Onto-Write panel with informative lines.....	243
Figure 95. Content of OntoArM Onto-Read panel with informative lines	244
Figure 96. Manual input of the RDF-triple	245
Figure 97. Manual reading the RDF-triple	246
Figure 98. A part from reading from all layers	246
Figure 99. Content of RDFArM RDF-Write panel with informative lines	250
Figure 100. Content of RDFArM RDF-Read panel with informative lines	250
Figure 101. A sample function for converting the natural language text in path	263
Figure 102. A sample code of procedure for storing information using NL-addressing.....	264
Figure 103. A sample code of procedure for reading information using NL-addressing.....	265
Figure 104. A sample function for executing a program.....	266
Figure 105. A sample JAVA interface for NLAWrite program)	266
Figure 106. A sample JAVA interface for NLARead program.....	267
Figure 107. A sample JAVA interface for executing a program.....	267
Figure 108. A visualization of a Growing pyramidal network	268
Figure 109. Screenshot from the ICON Ontological Editor.....	269
Figure 110. Protégé graphical representation of the sample graph	275
Figure 111. Main features of Oracle Berkeley DB.....	287