### 10. Bibliography

# 10.1. Bibliographical Notes

• Web page www.imm.dtu.dk/~dibj/domains/ lists the published papers and reports mentioned in the next two subsections.

# 10.1.1. Published Papers

- I have thought about domain engineering for more than 20 years.
- But serious, focused writing only started to appear since [10, Part IV] with [8, 7] being exceptions:

  - ≈ [14] covers the concept of domain facets;
  - ∞ [29] explores compositionality and Galois connections.
  - ≈ [12, 28] show how to systematically, but, of course, not automatically, "derive" requirements prescriptions from domain descriptions;

- ≈ [20] analyses the **TripTych**, especially its domain engineering approach, with respect to Maslow's <sup>34</sup> and Peterson's and Seligman's notions of humanity: how can computing relate to notions of humanity;
- \* the first part of [22] is a precursor for the present paper with its second part presenting a first formal model of the elicitation process of analysis and description based on the prompts more definitively presented in the current paper; and
- ≈ [23] focus on domain safety criticality.

<sup>&</sup>lt;sup>34</sup> Theory of Human Motivation. Psychological Review 50(4) (1943):370-96; and Motivation and Personality, Third Edition, Harper and Row Publishers, 1954. <sup>35</sup> Character strengths and virtues: A handbook and classification. Oxford University Press, 2004

The present paper basically replaces the domain analysis and description section of all of the above reference — including [10, Part IV].

#### **10.1.2. Reports**

We list a number of reports all of which document descriptions of domains. These descriptions were carried out in order to research and develop the domain analysis and description concepts now summarised in the present paper. These reports ought now be revised, some slightly, others less so, so as to follow all of the prescriptions of the current paper. Except where a URL is given in full, please prefix the web reference with: http://www2.compute.dtu.dk/~dibj/.

- 1 A Railway Systems Domain: http://euler.fd.cvut.cz/railwaydomain (2003)
- 2 Models of IT Security. Security Rules & Regulations: it-security.pdf (2006)
- 3 A Container Line Industry Domain: container-paper.pdf (2007)
- 4 The "Market": Consumers, Retailers, Wholesalers, Producers: themarket.p (2007)

- 5 What is Logistics?: logistics.pdf (2009)
- 6 A Domain Model of Oil Pipelines: pipeline.pdf (2009)
- 7 Transport Systems: comet/comet1.pdf (2010)
- 8 The Tokyo Stock Exchange: todai/tse-1.pdf and todai/tse-2.pdf (2010)
- 9 On Development of Web-based Software. A Divertimento: wfdftp.pdf (2010)
- 10 Documents (incomplete draft): doc-p.pdf (2013)

#### 10.2. References

- [1] J.-R. Abrial. The B Book: Assigning Programs to Meanings and Modeling in Event-B: System and Software Engineering. Cambridge University Press, Cambridge, England, 1996 and 2009.
- [2] A. Badiou. Being and Event. Continuum, 2005. (Lêtre et l'événements, Edition du Seuil, 1988).
- [3] G. Birkhoff. *Lattice Theory*. American Mathematical Society, Providence, R.I., 3 edition, 1967.
- [4] T. Bittner, M. Donnelly, and B. Smith. Endurants and Perdurants in Directly Depicting Ontologies. *AI Communications*, 17(4):247–258, December 2004. IOS Press, in [53].
- [5] T. Bittner, M. Donnelly, and B. Smith. Individuals, Universals, Collections: On the Foundational Relations of Ontology. In A. Varzi and L. Vieu, editors, Formal Ontology in Information Systems,

- Proceedings of the Third International Conference, pages 37–48. IOS Press, 2004.
- [6] D. Bjørner. Programming Languages: Formal Development of Interpreters and Compilers. In *International Computing Symposium 77 (eds. E. Morlet and D. Ribbens)*, pages 1–21. European ACM, North-Holland Publ.Co., Amsterdam, 1977.
- [7] D. Bjørner. Michael Jackson's Problem Frames: Domains, Requirements and Design. In L. ShaoYang and M. Hinchley, editors, ICFEM'97: International Conference on Formal Engineering Methods, Los Alamitos, November 12–14 1997. IEEE Computer Society. Final Version.
- [8] D. Bjørner. Domain Engineering: A "Radical Innovation" for Systems and Software Engineering? In Verification: Theory and Practice, volume 2772 of Lecture Notes in Computer Science, Heidelberg, October 7–11 2003. Springer-Verlag. The Zohar Manna

- International Conference, Taormina, Sicily 29 June 4 July 2003. Final draft version.
- [9] D. Bjørner. Software Engineering, Vol. 2: Specification of Systems and Languages. Texts in Theoretical Computer Science, the EATCS Series. Springer, 2006. Chapters 12–14 are primarily authored by Christian Krog Madsen.
- [10] D. Bjørner. Software Engineering, Vol. 3: Domains, Requirements and Software Design. Texts in Theoretical Computer Science, the EATCS Series. Springer, 2006.
- [11] D. Bjørner. Domain Theory: Practice and Theories, Discussion of Possible Research Topics. In *ICTAC'2007*, volume 4701 of *Lecture Notes in Computer Science (eds. J.C.P. Woodcock et al.)*, pages 1–17, Heidelberg, September 2007. Springer.
- [12] D. Bjørner. From Domains to Requirements. In *Montanari* Festschrift, volume 5065 of Lecture Notes in Computer Science

- (eds. Pierpaolo Degano, Rocco De Nicola and José Meseguer), pages 1–30, Heidelberg, May 2008. Springer.
- [13] D. Bjørner. On Mereologies in Computing Science. In Festschrift: Reflections on the Work of C.A.R. Hoare, History of Computing (eds. Cliff B. Jones, A.W. Roscoe and Kenneth R. Wood), pages 47–70, London, UK, 2009. Springer.
- [14] D. Bjørner. Domain Engineering. In P. Boca and J. Bowen, editors, Formal Methods: State of the Art and New Directions, Eds. Paul Boca and Jonathan Bowen, pages 1–42, London, UK, 2010. Springer.
- [15] D. Bjørner. Domain Science & Engineering From Computer Science to The Sciences of Informatics, Part I of II: The Engineering Part. Kibernetika i sistemny analiz, (4):100–116, May 2010.
- [16] D. Bjørner. Believable Software Management. Encyclopedia of Software Engineering, 1(1):1–32, 2011.

- [17] D. Bjørner. Domain Science & Engineering From Computer Science to The Sciences of Informatics Part II of II: The Science Part. Kibernetika i sistemny analiz, (2):100–120, May 2011.
- [18] D. Bjørner. Domains: Their Simulation, Monitoring and Control A Divertimento of Ideas and Suggestions. In Rainbow of Computer Science, Festschrift for Hermann Maurer on the Occasion of His 70th Anniversary., Festschrift (eds. C. Calude, G. Rozenberg and A. Saloma), pages 167–183. Springer, Heidelberg, Germany, January 2011.
- [19] D. Bjørner. Domain Analysis: A Model of Prompts (paper<sup>36</sup>, slides<sup>37</sup>). Research Report 2013-6, DTU Compute and Fredsvej 11, DK-2840 Holte, Denmark, Fall 2013.
- [20] D. Bjørner. Domain Science and Engineering as a Foundation for Computation for Humanity, chapter 7, pages 159–177. Com-

<sup>&</sup>lt;sup>36</sup>http://www.imm.dtu.dk/~dibj/da-mod-p.pdf

<sup>&</sup>lt;sup>37</sup>http://www.imm.dtu.dk/~dibj/da-mod-s.pdf

- putational Analysis, Synthesis, and Design of Dynamic Systems. CRC [Francis & Taylor], 2013. (eds.: Justyna Zander and Pieter J. Mosterman).
- [21] D. Bjørner. A Rôle for Mereology in Domain Science and Engineering. Synthese Library (eds. Claudio Calosi and Pierluigi Graziani). Springer, Amsterdam, The Netherlands, October 2014.
- [22] D. Bjørner. Domain Analysis: Endurants An Analysis & Description Process Model. In S. Iida, J. Meseguer, and K. Ogata, editors, Specification, Algebra, and Software: A Festschrift Symposium in Honor of Kokichi Futatsugi. Springer, May 2014.
- [23] D. Bjørner. Domain Engineering A Basis for Safety Critical Software. Invited Keynote, ASSC2014: Australian System Safety Conference, Melbourne, 26–28 May, December 2014.
- [24] D. Bjørner. Manifest Domains: Analysis & Description. Research Report, 2014. Part of a series of research reports: [26, 27], Being

- submitted.
- [25] D. Bjørner. Domain Analysis: Endurants a Consolidated Model of Prompts. Research Report, DTU Compute and Fredsvej 11, DK-2840 Holte, Denmark, May 2015.
- [26] D. Bjørner. Domain Analysis & Description: Models of Processes and Prompts. Research Report, To be completed early 2014. Part of a series of research reports: [24, 27].
- [27] D. Bjørner. From Domains to Requirements A Different View of Requirements Engineering. Research Report, To be completed mid 2015. Part of a series of research reports: [24, 26].
- [28] D. Bjørner. The Role of Domain Engineering in Software Development. Why Current Requirements Engineering Seems Flawed! In *Perspectives of Systems Informatics*, volume 5947 of *Lecture Notes in Computer Science*, pages 2–34, Heidelberg, Wednesday, January 27, 2010. Springer.

- [29] D. Bjørner and A. Eir. Compositionality: Ontology and Mereology of Domains. Some Clarifying Observations in the Context of Software Engineering in July 2008, eds. Martin Steffen, Dennis Dams and Ulrich Hannemann. In Festschrift for Prof. Willem Paul de Roever Concurrency, Compositionality, and Correctness, volume 5930 of Lecture Notes in Computer Science, pages 22–59, Heidelberg, July 2010. Springer.
- [30] D. Bjørner and C. B. Jones, editors. The Vienna Development Method: The Meta-Language, volume 61 of LNCS. Springer, 1978.
- [31] D. Bjørner and C. B. Jones, editors. Formal Specification and Software Development. Prentice-Hall, 1982.
- [32] R. Casati and A. Varzi. Parts and Places: the structures of spatial representation. MIT Press, 1999.

- [33] R. Casati and A. Varzi. Events. In E. N. Zalta, editor, *The Stanford Encyclopedia of Philosophy*. Spring 2010 edition, 2010.
- [34] R. Casati and A. C. Varzi, editors. *Events*. Ashgate Publishing Group Dartmouth Publishing Co. Ltd., Wey Court East, Union Road, Farnham, Surrey, GU9 7PT, United Kingdom, 23 March 1996.
- [35] D. Davidson. Essays on Actions and Events. Oxford University Press, 1980.
- [36] F. Dretske. Can Events Move? *Mind*, 76(479-492), 1967. reprinted in [34], pp. 415-428.
- [37] J. Fitzgerald and P. G. Larsen. *Modelling Systems Practical Tools and Techniques in Software Development*. Cambridge University Press, The Edinburgh Building, Cambridge CB2 2RU, UK, 1998. ISBN 0-521-62348-0.

- [38] B. Ganter and R. Wille. Formal Concept Analysis Mathematical Foundations. Springer-Verlag, January 1999. ISBN: 3540627715, 300 pages, Amazon price: US\$ 44.95.
- [39] C. W. George, P. Haff, K. Havelund, A. E. Haxthausen, R. Milne, C. B. Nielsen, S. Prehn, and K. R. Wagner. *The RAISE Specifica-tion Language*. The BCS Practitioner Series. Prentice-Hall, Hemel Hampstead, England, 1992.
- [40] C. W. George, A. E. Haxthausen, S. Hughes, R. Milne, S. Prehn, and J. S. Pedersen. *The RAISE Development Method*. The BCS Practitioner Series. Prentice-Hall, Hemel Hampstead, England, 1995.
- [41] P. Hacker. Events and Objects in Space and Time. *Mind*, 91:1–19, 1982. reprinted in [34], pp. 429-447.
- [42] D. Harel. Statecharts: A visual formalism for complex systems. Science of Computer Programming, 8(3):231–274, 1987.

- [43] C. A. R. Hoare. Communicating Sequential Processes. C.A.R. Hoare Series in Computer Science. Prentice-Hall International, 1985. Published electronically: http://www.usingcsp.com/csp-book.pdf (2004).
- [44] ITU-T. CCITT Recommendation Z.120: Message Sequence Chart (MSC), 1992, 1996, 1999.
- [45] D. Jackson. Software Abstractions: Logic, Language, and Analysis. The MIT Press, Cambridge, Mass., USA, April 2006. ISBN 0-262-10114-9.
- [46] I. Johansson. Qualities, Quantities, and the Endurant-Perdurant Distinction in Top-Level Ontologies. In D. A. B. R. N. M. R.-B. T. Althoff, K.-D., editor, *Professional Knowledge Management WM 2005*, volume 3782 of *Lecture Notes in Artificial Intelligence*, pages 543–550. Springer, 2005. 3rd Biennial Conference, Kaiserslautern, Germany, April 10-13, 2005, Revised Selected Papers.

- [47] J. Kim. Supervenience and Mind. Cambridge University Press, 1993.
- [48] L. Lamport. Specifying Systems. Addison-Wesley, Boston, Mass., USA, 2002.
- [49] D. Mellor. Things and Causes in Spacetime. British Journal for the Philosophy of Science, 31:282–288, 1980.
- [50] C.-Y. T. Pi. Mereology in Event Semantics. Phd, McGill University, Montreal, Canada, August 1999.
- [51] A. Quinton. Objects and Events. *Mind*, 88:197–214, 1979.
- [52] W. Reisig. Petrinetze: Modellierungstechnik, Analysemethoden, Fallstudien. Leitfäden der Informatik. Vieweg+Teubner, 1st edition, 15 June 2010. 248 pages; ISBN 978-3-8348-1290-2.

- [53] J. Renz and H. W. Guesgen, editors. *Spatial and Temporal Reasoning*, volume 14, vol. 4, Journal: AI Communications, Amsterdam, The Netherlands, Special Issue. IOS Press, December 2004.
- [54] G. Wilson and S. Shpall. Action. In E. N. Zalta, editor, *The Stanford Encyclopedia of Philosophy*. Summer 2012 edition, 2012.
- [55] J. C. P. Woodcock and J. Davies. *Using Z: Specification, Proof and Refinement*. Prentice Hall International Series in Computer Science, 1996.
- [56] C. C. Zhou and M. R. Hansen. *Duration Calculus: A Formal Approach to Real-time Systems*. Monographs in Theoretical Computer Science. An EATCS Series. Springer-Verlag, 2004.