Domain Science & Engineering

A Review of 10 Years Work

The NUS October 2018 Seminars & Lectures

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9, 12, 19, 26 October, 2018: 16:00–18:00

- Dines Bjørner is visiting NUS SoC 5-27 October 2018.
- During his visit he will give **2 Seminars**, **8 MSc/PhD Lectures** and do some **Research**:
- **Domain Science & Engineering** Seminar Paper[1] Lecture "Slides"[2]
  - ⋘ **Week 1, Day 1, Tue.9.10, 16:00–18:00, Aud.: SR3 (COM1-02-12) Seminar 1:**
    - ⚭ **Lecture 1: Introduction**, 30 mins.
      - So that You know what I've been up to!
      - A prelude also to Lectures 2–5.
      - A basis for possible discussions with NUS colleagures.
    - ⚭ **Lecture 2: Domain Analysis & Description** (I), 60 mins. [1]
  - ⋘ **Week 1, Day 2, Fri.12.10, 16:00–18:00, Aud.: EC COM2-04-02:**
    - ⚭ **Lecture 3: Domain Analysis & Description** (II), 45+30 = 75 mins. [1]
    - ⚭ **Lecture 4: Domain Facets**, 15 mins. [2]
  - ⋘ **Week 2, Day 3, Fri.19.10, 16:00–18:00, Aud.: EC COM2-04-02:**
    - ⚭ **Lecture 5: From Domains to Requirements**, 30 mins. [3]
    - ⚭ **Lecture 6: Formal Model of Prompts**, 30 mins. [4]
    - ⚭ **Lecture 7: Axioms and Models of Mereology**, 30 mins. [5]
  - ⋘ **Week 3, Day 4, Fri.26.10, 16:00–18:00, Cerebro@COM1-0-05 Seminar 2:**
    - ⚭ **Lecture 8: A Basis in Philosophy**, 30+30 mins. [6]
    - ⚭ **Lecture 9: Conclusion**, 20 mins.
- **Research:**
  - ⋘ **A Possible Rôle for Philosophy in Computing Science**
  - ⋘ to be extracted from report[3]
- **Seminar Abstract:**

  By a **domain** *we shall understand a* **rationally describable** *segment of a* **human assisted** *reality, i.e., of the world, its* **physical parts**, **natural** *["God-given"] and* **artifactual** *["man-made"], and* **living species**: **plants** *and* **animals** *including, notably,* **humans**. *These are* **endurants** *("still"), existing in space, as well as* **perdurants** *("alive"), existing also in time. Emphasis is placed on* **"human-assistedness"**, *that is, that there is at least one (man-made)* **artifact** *and, therefore, that* **humans** *are a primary cause for change of endurant* **states** *as well as perdurant* **behaviours**.

  The seminar presents an overview of domain analysis and domain description calculi of a method for constructing domain descriptions – a phase preceding software systems requirements engineering.

[1] http://www.imm.dtu.dk/ dibj/2018/tosem/Bjorner-ACM-TOSEM.pdf
[2] http://www.imm.dtu.dk/ dibj/2018/nus/nus2018.pdf
[3] http://www.imm.dtu.dk/ dibj/2018/philosophy/filo.pdf

- **Lecture Abstract:**
  The lectures will introduce a number of issues of **Domain Science & Enginering** *as reflected in the papers listed below*

References

[1] Dines Bjørner. A Domain Analysis & Description Method – Principles, Techniques and Modelling Languages. Paper submitted for publication, Technical University of Denmark, Fredsvej 11, DK-2840 Holte, Denmark, May 16 2018. [4].

[2] Dines Bjørner. Domain Facets: Analysis & Description. Technical report, Technical University of Denmark, Fredsvej 11, DK-2840 Holte, Denmark, May 2018. Extensive revision of [7]. [5].

[3] Dines Bjørner. From Domain Descriptions to Requirements Prescriptions – A Different Approach to Requirements Engineering. Technical report, Technical University of Denmark, Fredsvej 11, DK-2840 Holte, Denmark, 2016. Extensive revision of [8][6].

[4] Dines Bjørner. Domain Analysis and Description – Formal Models of Processes and Prompts. Technical report, Technical University of Denmark, Fredsvej 11, DK-2840 Holte, Denmark, 2016. Extensive revision of [9]. [7].

[5] Dines Bjørner. To Every Manifest Domain a CSP Expression — A Rôle for Mereology in Computer Science. *Journal of Logical and Algebraic Methods in Programming*, (94):91–108, January 2018. [8].

[6] Dines Bjørner. A Philosophy of Domain Science & Engineering – An Interpretation of Kai Sørlander's Philosophy. Research Note, Technical University of Denmark, Fredsvej 11, DK-2840 Holte, Denmark, Spring 2018. [9].

[7] Dines Bjørner. Domain Engineering. In Paul Boca and Jonathan Bowen, editors, *Formal Methods: State of the Art and New Directions*, Eds. Paul Boca and Jonathan Bowen, pages 1–42, London, UK, 2010. Springer.

[8] Dines 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. [10].

[9] Dines Bjørner. Domain Analysis: Endurants – An Analysis & Description Process Model. In Shusaku Iida and José Meseguer and Kazuhiro Ogata, editor, *Specification, Algebra, and Software: A Festschrift Symposium in Honor of Kokichi Futatsugi*. Springer, May 2014. [11].

[4] http://www.imm.dtu.dk/~dibj/2018/tosem/Bjorner-TOSEM.pdf
[5] http://www.imm.dtu.dk/~dibj/2016/facets/faoc-facets.pdf
[6] http://www2.compute.dtu.dk/~dibj/2015/faoc-req/faoc-req.pdf
[7] http://www.imm.dtu.dk/~dibj/2016/process/process-p.pdf
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