

# Prototyping Distributed Systems

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The modeling, the properties and functionalities checking of the large and small scale distributed systems requires deep analysis and relationship definitions of the distributed systems' components. Describing the collaborating computational components controlling physical entities of concurrently running units involves prototyping and executable semantics programming [3]. Also comparisons of various type of complex systems (cyber-physical systems, embedded systems, high performance computation systems and others) need systematic designing steps and well defined prototypes.

General structural description is considered when modeling, and specific examples are taken from CPS systems [2] and embedded systems [1]. The systems' prototyping implementation covers main aspects, features and approaches of practical functionalities point of view in order to establish a general model of the chosen distributed system. Several important notions, definitions of computation distribution world, relationships are clarified when prototyping.

The comparisons with distributed systems are important due to the earlier expertise and experience in multi-layered distributed system description with semantics given in executable ways [3]. Case studies description applied on specific concurrent computation situation and their connections with other distributed systems is considered in the paper.

## References

- [1] Lee, E. A., Seshia, S. A.: Introduction to Embedded Systems – A Cyber-Physical Systems Approach, LeeSeshia.org, 2011.
- [2] Tricaud, C., YangQuan Ch.: Optimal Mobile Sensing and Actuation Policies in Cyber-physical Systems, Springer Verlag, 2012.
- [3] Zsók V., Koopman, P., Plasmeijer, R.: Generic Executable Semantics for *D-Clean*, In: Porkoláb Z. et al. (eds.): *Proceedings of the Third Workshop on Generative Technologies*, WGT 2011, ETAPS 2011, Saarbrücken, Germany, March 27, 2011, ENTCS Vol. 279, No. 3, Elsevier, December 2011, pp. 85–95.