Synchronous coordination of distributed components

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Stellingen

behorende by het proefschrift
Synchronous Coordination of Distributed Components.

1. Synchronous coordination systems are more expressive than asynchronous ones, but their implementations tend to be more complex and have lower performance. *(Chapter 2)*

2. True synchrony does not exist in distributed systems. However, we can approximate it by assuming certain properties of the nodes of such systems, e.g, the possibility to backtrack or the apriori agreement of a contract. *(Chapter 3)*

3. Solving constraints describing valid synchronous coordination patterns is an NP-complete problem in general. However, there has been tremendous progress in SAT solving, partially due to worldwide competitions of SAT solvers. This progress suggests that SAT solvers are good candidates for solving constraints imposed by synchronous coordination models. *(Chapter 5)*

4. Reo is a synchronous coordination language which also uses asynchronous constructs, such as FIFO1 buffers. We exploit these asynchronous constructs to improve the performance and increase the scalability of implementations of Reo. *(Chapters 6 and 7)*

5. Since Linda appeared many other coordination languages have emerged. Understanding the fundamental differences between existing coordination languages and their underlying assumptions is both challenging and useful when developing coordination systems.

6. Reconfiguration of coordination systems is a non-trivial process and prone to errors. Using dataflow patterns to trigger reconfigurations opens new possibilities to statically verify safety properties of these reconfigurations.

7. Developers of coordination systems need intuitive and simple, yet expressive, coordination models. Visual formalisms and visual animations provide more intuition to the developers than other models.

8. To develop and maintain complex systems one needs to divide them into smaller manageable parts. These smaller parts can be combined only in a *compositional* environment. Hence a good compositional framework is required when developing large systems.

9. Doing science requires not only developing new ideas, but also sharing these ideas and interacting with people. An elegant and clear writing style, along with an understanding of what the reader needs, are therefore important skills that one must learn when doing research.

10. *Mens sana in corpore sano.* The mind is only productive by keeping the body alive and active. Sports and exercise help to think clearly.