Preface

There is a growing awareness that most specification and verification methods have reached their limits. Model-checking (in spite of the striking progress due to symbolic methods) can check finite-state systems up to a certain size, and deductive methods, due to the heavy user interaction required, can handle only systems of small complexity. If there is hope that industrial-size designs can be handled by formal methods, it must be based on the two premises of *compositionality* and *abstraction*.

Under compositionality, we include any method by which the properties of a system can be inferred from properties of its constituents, without additional information about the internal structure of these constituents. The two main questions that have to be addressed in forming a viable compositional theory are:

- How to decompose a global specification into local specifications which will be satisfied by the individual components?
- Having shown that the local specifications are satisfied by their respective components, how to infer the global specification from this?

One of the recently suggested methods for combining algorithmic (model-checking) with deductive (proof-theoretic) verification methods is by the use of compositional methods, in which the local specifications are verified by algorithmic methods and the specification decomposition and re-composition are done using deductive technology.

This particular suggestion, as well as many others, was considered at the Symposium "Compositionality: The Significant Difference" (COMPOS'97), organized at Hotel Intermar, Bad Malente, Germany, September 8–12, 1997. The idea for organizing this symposium was suggested by Ben Moszkowski.

The present volume constitutes the proceedings of this symposium. It reflects the current state-of-the-art in compositional reasoning about concurrency. Apart from the contributions written by the speakers, this volume also contains a contribution by Mads Dam. In order to put all those contributions into proper perspective, one of the organizers, W.-P. de Roever, has written a survey for these proceedings describing the main issues in compositional reasoning and the history of their evaluation, as reflected in the current literature.

The local organization was in the able hands of Änne Straßner. We express our genuine gratitude to her for her efforts.

Last but not least, we would like to thank the speakers for their active and responsive participation, for giving such excellent talks, and for putting so much effort in writing their contributions. This made this symposium a memorable event not only for its participants but also for its organizers.

September 1998   W.-P. de Roever,   H. Langmaack,   A. Pnueli