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Anders P. Ravn Hans Rischel (Eds.)

Formal Techniques in Real-Time and Fault-Tolerant Systems

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Preface

Embedded systems have become a hot topic in computer science because technology has made computers very powerful and very inexpensive. Thus it becomes possible and economically feasible to embed sophisticated computational models for the control of physical systems even in common appliances, automobiles, etc. Such applications must conform to physical laws dictated by their construction and their intended use, i.e., the computations must interact with a dynamical system which has timing constraints on when certain actions must occur. The computations have hard real-time constraints. Furthermore, some of the applications must continue to work even in the presence of intermittent or permanent faults in the electronics, thus they must be fault tolerant.

Engineering of embedded systems must thus rely on models for real-time and fault-tolerant computing. Mathematical foundations for developing, understanding and applying such models are the topic of this school and symposium. It is the fifth in a line of international schools and symposia; the previous ones were held in Warwick 1989, at Nijmegen 1992, at Lübeck 1994, and in Uppsala 1996. The proceedings of the symposia are published in LNCS 331, 571, 863, and 1135.

The lectures at the school are given by Albert Benveniste (IRISA, Rennes, France), Gérard Le Lann (INRIA Le Chesnay, France), Jan Peleska (Bremen, Germany), Jørgen Staunstrup (Lyngby, Denmark), and Frits Vaandrager (Nijmegen, The Netherlands). Invited presentations at the symposium are given by Connie Heitmeyer (Naval Res. Lab., USA), John Knight (Virginia, USA), Amir Pnueli (Weizmann Inst., Israel), and Joseph Sifakis (VERIMAG, France). We thank the lecturers and speakers for their contributions.

The program committee selected 22 papers for presentation. In addition the symposium has 5 tool demonstrations with short presentations in this volume.

This school and symposium is supported by the Technical University of Denmark, in particular the Department of Information Technology, and by the Danish Technical Research Council. The school is also supported by The Danish Research Academy via The Graduate School in Microelectronics. Local publicity has been supported by DELTA and IFAD. We are very grateful for this support which has made this event possible.

We shall also like to thank the steering committee for valuable advice, and to thank Disa la Cour, Maria Hansen, and Karin S. Mogensen for their enthusiastic practical support.

Lyngby, July 1998 Anders P. Ravn, Hans Rischel

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