Call for Chapter Submission to a Book on
Model-Based Testing for Embedded Systems

in a new series on *Computational Analysis, Synthesis, and Design of Dynamic Systems*
to be published by *CRC Press*

Objectives:

With the ever increasing penetration of software-intensive embedded systems into technical, business, and social areas, not only the requirements on system functionality and features, but also the requirements on system quality and reliability have increased. By the same token, with the increasing requirements, the complexity of systems is growing—combined with an increasing error-proneness that is further exacerbated by shortened development times. In order to remain competitive, an early and continuous consideration and assurance of system reliability and quality had become of increasing importance in industrial software development.

Model-based approaches help not only in an effective quality assurance, but also allow evaluation and control of the coverage, cost, and risk related to the testing efforts. Both—the effectiveness and the efficiency of testing—can be handled by model-based approaches towards integrated system and test development. Currently, model-based testing considers selected aspects of system models in isolation, for example, structural or behavioral. This renders the methods of limited applicability. In order to scale with respect to the size and conceptual complexity of modern systems, the different methods must be applied in concert and complementary to one another.

This book aims at presenting model-based testing from a number of different perspectives that combine various aspects of embedded systems, embedded software, and their models. The integration of different system aspects and different system models becomes critical as system complexity increases. It is also important for systems that are partially developed in software and partially in hardware or that are developed by different vendors with off-the-shelf components.

The benefit of this book is to provide an overview on the theory and practice concerning the test specification and validation of complex software-intensive embedded systems. The detailed examples from industry provide the reader with solutions that are applicable in their daily testing practice.

The main topics to be covered include but are not limited to:

- A comprehensive elaboration on different model-based testing (MBT) approaches with a clear classification of its different aspects resulting in an MBT taxonomy
- Specifics of embedded system testing
- Various test development levels (e.g., component, system, integration)
- Different test types (i.e., white, grey, black box)
- Selected test processes
- MBT applicability to multiple domains
- Overviews and surveys

Furthermore, the book will:

- Present recent MBT approaches proposed by academia and industry
- Provide a global view of the current practices in MBT and helps the engineers to choose the most appropriate solution for their specific problems
- Describe novel test solutions for dealing with the heterogeneity of embedded systems integrating components from multiple application domains (e.g., mechanical, automotive, telecommunication)
- Present examples of solutions applicable in the daily test practice

This book will help in better understanding problems regarding system and software quality, as well as the entire test process in many different companies. It is intended for both the industry-related professionals and academic experts, in particular those interested in quality assurance.

Schedule:

Issue:	**Due to:**	**Task Responsibility:**
Chapter abstract (1 page)	15.06.2009	Contributor
Chapter submission due	15.09.2009	Contributor
Chapter acceptance and feedback review	15.11.2009	Editor
Revised chapter due	01.02.2010	Contributor
Chapter final acceptance	01.04.2010	Editor
Book draft	01.05.2010	Editor
Book ready to be printed	01.06.2010	Editor

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