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Tools and Methods of Competitive Engineering

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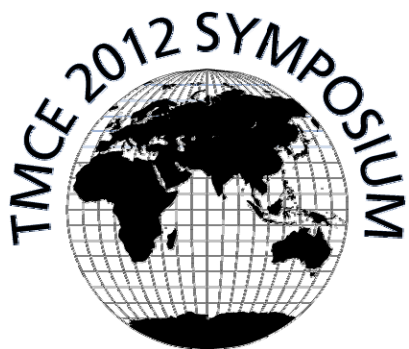
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Tools and Methods of Competitive Engineering

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Foreword

Every TMCE Symposium features a kind of duality. This is the result of the intension of the Program Committee to pay balanced attention to the latest theories, methodologies, systems and tools that can enhance the potentials and efficiency of competitive engineering, and to a novel, or just emerging, domain of research and development that may play an important role in the enhancement of the competitiveness of product and service engineering in the near future. For TMCE 2012, the domain of mobile communication and ubiquitous computing technologies has been selected as an additional domain of interest. Actually, mobile and ubiquitous technologies have already proved their 'raison d'etre' and demonstrated their possible impacts on global product development and production processes. Studying the related phenomena, generating disciplinary insights and discoveries, and exploring knowledge for practical enhancement are important for academic research, industrial product development and commercial application.

Mobile and ubiquitous technologies include multiple families of information mining, sensing, transmission and communication, networking, conversion, reasoning and actuator technologies, which lend themselves to the realization of smart, context sensitive, and adaptive systems and services. They facilitate the implementation of new functioning paradigms, such as cooperative problem solving, situated reasoning, and self-reconfiguration. They have been used to support geographically distributed, knowledge-intensive and collaborative product development and production processes. The influence of these technologies will even be higher in the near future when they reach their next stage of maturity and the methodological principles of designing and engineering complex, distributed, smart, and proactive systems will be known. They are paving the way to the next-generation of cyber-physical systems.

So as in the preceding years, the Program Committee commenced with a very large number of submitted abstracts, out of which only those were accepted as basis of full-length papers that focused either on the traditional assets of competitive engineering or on the possible engineering applications of mobile communication and ubiquitous computing technologies. The submitted full-length papers and short/extended technical notes were carefully studied by the Program Committee, and some 140 manuscripts were sent to peer reviewers. A lot of constructive comments were fed back to the authors by the peers and by the Program Committee. In the end, 92 technical papers have been accepted for publication in these printed Proceedings in full length. In addition, six invited survey and tutorial papers have been included. The contributed forum papers and technical notes have been included in full length in the digital (flash drive) Proceedings of TMCE 2012. Each of the published survey, research, and application papers offers some novel scientific and/or engineering work and results. A large part of them will be republished in special issues of international design and engineering journals after the necessary adaptations.

We offer these Proceedings to industrial product designers, engineers and managers, as well as to academic researchers, educators and students as a high quality state of the art survey of virtual engineering and as a useful reference in terms of the theories, methodologies, systems and best practices. Many papers also point towards probable and promising future research opportunities and possible developments. For this reason, these Proceedings can also be

useful for research funders, governmental policy makers, industrial managers and consultants. We think the contributing authors did an excellent job and we are very grateful for their contribution, as well as for their helpful cooperation in the paper review and revision process. Without their outstanding scientific work and results, the International TMCE 2012 Symposium could not be so successful and these Proceedings could not be so valuable.

We are also very grateful for the constructive comments and proposals of the peer reviewers. Their names are mentioned in the Members of the International Paper Review Panel section. We are especially indebted to our colleagues who contributed to the Symposium not only as members of the Organizing Committee, but also as lead authors and co-authors. Their names are mentioned in the last section of this Foreword. Finally, we highly appreciate the support of the premium sponsor, the Parametric Technology Corporation Germany, Germany, the co-premium sponsor, the Shaeffler KG., Germany, the sponsor, the Emerald Eye R & C Company, the Netherlands, the Delft University of Technology, Delft, the Netherlands, and the Karlsruhe Institute of Technology, Karlsruhe, Germany.



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