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IFIP – The International Federation for Information Processing

IFIP was founded in 1960 under the auspices of UNESCO, following the First World Computer Congress held in Paris the previous year. An umbrella organization for societies working in information processing, IFIP's aim is two-fold: to support information processing within ist member countries and to encourage technology transfer to developing nations. As ist mission statement clearly states,

> *IFIP's mission is to be the leading, truly international, apolitical organization which encourages and assists in the development, exploitation and application of information technology for the benefit of all people.*

IFIP is a non-profitmaking organization, run almost solely by 2500 volunteers. It operates through a number of technical committees, which organize events and publications. IFIP's events range from an international congress to local seminars, but the most important are:

- The IFIP World Computer Congress, held every second year;
- Open conferences;
- Working conferences.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is small and by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is less rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

Any national society whose primary activity is in information may apply to become a full member of IFIP, although full membership is restricted to one society per country. Full members are entitled to vote at the annual General Assembly, National societies preferring a less committed involvement may apply for associate or corresponding membership. Associate members enjoy the same benefits as full members, but without voting rights. Corresponding members are not represented in IFIP bodies. Affiliated membership is open to non-national societies, and individual and honorary membership schemes are also offered.

Svetan Ratchev (Ed.)

Precision Assembly Technologies and Systems

6th IFIP WG 5.5
International Precision Assembly Seminar, IPAS 2012
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Preface

The book includes a selected set of papers presented at the 6th International Precision Assembly Seminar (IPAS 2012) held in Chamonix, France, in February 2012. The International Precision Assembly Seminar which was established in 2003 by the European Thematic Network Assembly-Net, has developed into the premier international event for presenting and discussing the latest research, new innovative technologies and industrial applications in the area of precision assembly.

By analogy with precision machining, precision assembly as a process covers a wide range of products where handling, positioning, manipulation and joining technologies are constrained by demand for relative accuracy of a small fraction of the features or part sizes. At the micro-scale, a distinctive feature of precision assembly is that surface forces are often dominant over gravity forces, which determines a number of specific technical challenges including high-accuracy positioning and manipulation techniques, micro-gripping methods that take into account the surface forces, high-precision micro-feeding techniques and micro-joining processes.

Precision assembly of complex high-value products is a key manufacturing process in sectors such as automotive, aerospace and defence, pharmaceutical and medical industries. Some of the common trends underlining the development of precision assembly systems in theses sectors include: increased demand for rapid ramp-up and downscale of production systems; increased demand for assembly systems which can react to disruptive events and fluctuations during the production process; and a drive toward after-sales service contracts for maintenance and equipment upgrade.

The book is structured into six chapters. Chapter 1 includes papers dedicated to micro-assembly processes and systems ranging from desktop factory automation and packaging of MEMS to self-assembly processes and platforms. Chapter 2 is focused on handling and manipulation and includes contributions in flexible gripper systems, fixturing and high-precision actuators. Chapter 3 includes a range of contributions in tolerance management and error-compensation techniques applied at different scales of precision assembly. Chapter 4 describes some of the latest developments in metrology and quality control, while Chap. 5 introduces contributions in intelligent assembly control. Finally, Chap. 6 concludes with contributions in process selection, modeling and planning.

The seminar was sponsored by the International Federation of Information Processing (IFIP) WG5.5, the International Academy of Production Research (CIRP) and the European Factory Automation Committee (EFAC). The seminar is supported by a number of ongoing research initiatives and projects including the European sub-technology platform in Micro and Nano Manufacturing MINAM 2.0 and the EU funded collaborative projects FRAME and COPERNICO.

The organizers should like to express their gratitude to the members of the International Advisory Committee for their support and guidance and to the authors of the papers for their original contributions. Special thanks go to Ruth Strickland and Rachel O'Shea from the Precision Manufacturing Centre at the University of Nottingham for handling the administrative aspects of the seminar, putting the proceedings together and managing the detailed liaison with the authors and the publishers.

Svetan M. Ratchev

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