

IFIP AICT 620

Svetan Ratchev (Ed.)



Smart Technologies for Precision Assembly

9th IFIP WG 5.5

International Precision Assembly Seminar, IPAS 2020

Virtual Event, December 14–15, 2020

Revised Selected Papers

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IFIP is the global non-profit federation of societies of ICT professionals that aims at achieving a worldwide professional and socially responsible development and application of information and communication technologies.

IFIP is a non-profit-making organization, run almost solely by 2500 volunteers. It operates through a number of technical committees and working groups, which organize events and publications. IFIP's events range from large international open conferences to working conferences and local seminars.

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 generally smaller and occasionally by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is also 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.

IFIP distinguishes three types of institutional membership: Country Representative Members, Members at Large, and Associate Members. The type of organization that can apply for membership is a wide variety and includes national or international societies of individual computer scientists/ICT professionals, associations or federations of such societies, government institutions/government related organizations, national or international research institutes or consortia, universities, academies of sciences, companies, national or international associations or federations of companies.

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Preface

Since its inception in 2003 the International Precision Assembly Seminar (IPAS) has created a strong international community which meets regularly to share new developments in a wide range of assembly theory and practice, report exciting research results and discuss high-impact industrial applications. The seminar also provides a forum for debating new ideas and formulating new lines of research.

This book includes a selected set of papers presented at the 9th IPAS, which was originally planned to take place in the beautiful winter surroundings of Kitzbühel, Austria between 15 and 17 March 2020. Due to the Covid-19 pandemic, it was instead held as a virtual seminar on 14 and 15 December 2020.

The main theme of the 9th IPAS seminar was the application of smart technologies for precision assembly with specific emphasis on human-centred assembly processes and systems. The book is structured into six sections: keynote paper, assembly design and planning, assembly operations, design of assembly cells and systems, human-centred assembly and assistive methods for assembly. The selected papers reflect on the dramatic impact of digital technologies in assembly with specific focus on how such technologies can be leveraged to improve assembly process performance and promote new types of human-in-the-loop assembly systems.

The seminar was sponsored by the International Federation of Information Processing (IFIP) WG5.5 and the International Institution of Production Engineering Research (CIRP). The organisers would 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 and enthusiastic and active participation in the seminar. We would like to thank Professor Hamideh Afsarmanesh, chair of the IFIP WG 5.5, and Prof. Dr.-Ing. Jörg Krüger, chair of the STC-A of CIRP, for their continuous support, encouragement and sponsorship of the seminar. Our special thanks also go to Nancy Martin for her exceptional handling of the administrative aspects of the seminar and for managing the communication with all delegates, organisers and publishers in what has been a very challenging time.

January 2020

Svetan Ratchev
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