MICROTECHNOLOGY AND MEMS

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Design and Manufacturing of Active Microsystems

Springer

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Preface

Microsystems technology, which is considered to be a key technology for the 21^{st} century, integrates signal processing with miniaturized sensors and actuators. This opens up a whole range of new applications going beyond purely microelectronics systems. For some time now, microsystem products have emerged as an important part of our everyday lives as witnessed by their successful application in various fields such as car-making, biomedical engineering and communications technology.

Whereas the field of microsensors is already highly advanced, microactuators are still in the basic development phase. Consequently, there is large demand for basic research and experimental development in the field of microactuators. This demand has been picked up at the Technische Universität Braunschweig in the late 1990s and has led to the establishment of the Collaborative Research Center "Design and Manufacturing of Active Micro Systems" in 1998. Five institutes belonging to the Department of Mechanical Engineering of the Technische Universität Braunschweig, institutes of the Leibniz Universität Hannover, laboratories of the Fraunhofer-Institut für Schicht-und Oberflächentechnik, the Physikalisch-Technische Bundesanstalt, and the Laserzentrum Hannover have jointly developed fundamentals for the design and manufacturing of active microsystems over a period of twelve years. The applicability of the methods and technologies developed has been verified on the basis of several prototypes of miniaturized stepper motors. This book summarizes the results obtained through the fruitful cooperation within the Collaborative Research Center (SFB 516).

Special thanks go to the German Research Foundation, which funded the Collaborative Research Center over twelve years. We are grateful to all authors for their participation and their contribution to this book. Last but not least we would like to thank all people who have helped to complete this book, especially Jan Torben Runte, Paul Frakes, and Robert John Ellwood for proofreading and many useful ideas.

Braunschweig (Germany),
December 2010

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