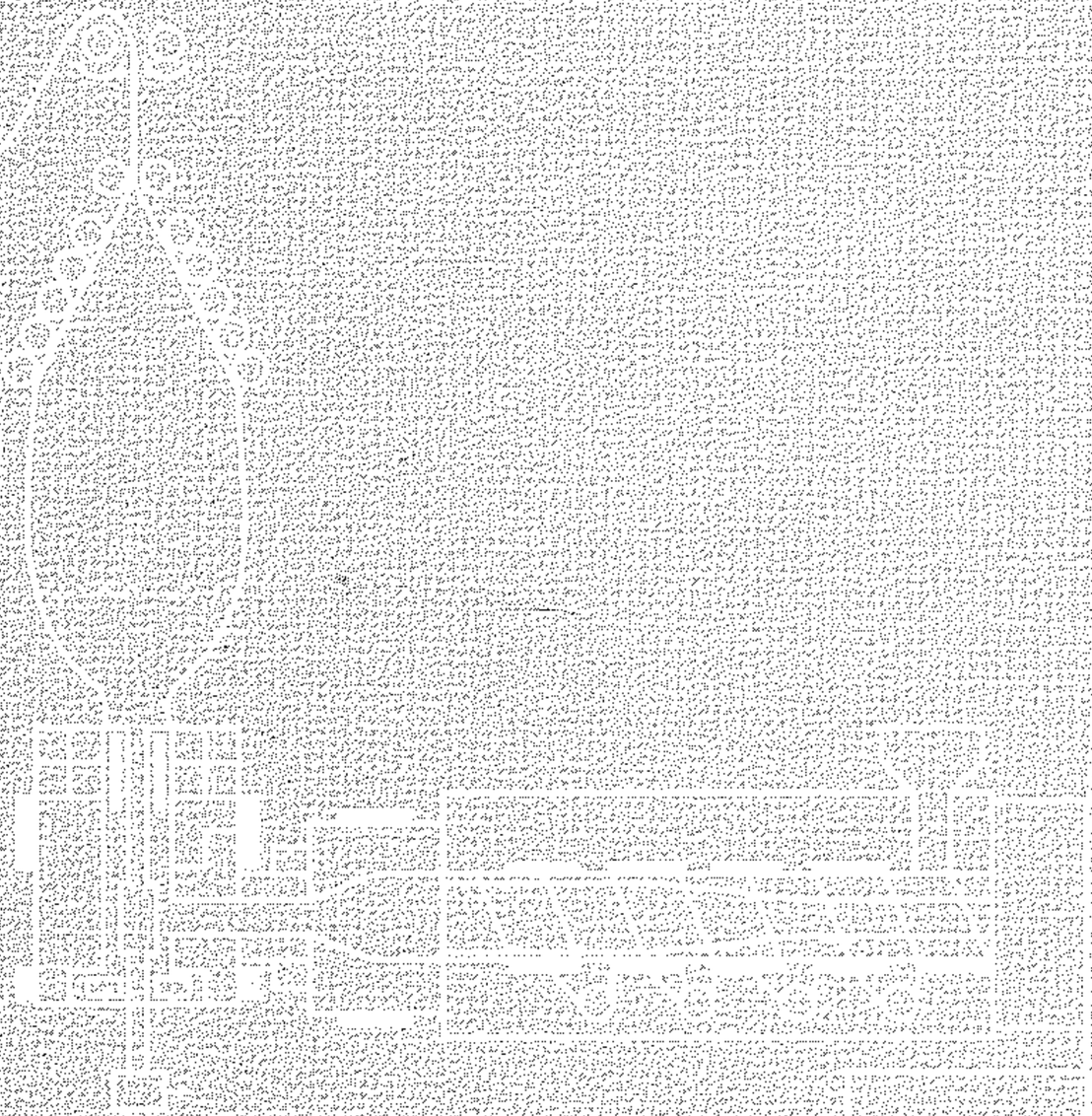
Andrew P. Featherstone,
Jeremy G. VanAntwerp and Richard D. Braatz

IDENTIFICATION AND CONTROL OF SHEET AND FILM PROCESSES



Advances in Industrial Control

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Andrew P. Featherstone, Jeremy G. VanAntwerp
and Richard D. Braatz

Identification and Control of Sheet and Film Processes

With 63 Figures

Springer

CONTENTS

Sheet and film processes include coating, papermaking, metal rolling, and polymer film extrusion. The products of these processes include paper, bumper stickers, plastic bags, windshield safety glass, and sheet metal. The total capitalization of industries that rely on these processes is well over $500 billion worldwide. These processes are notorious for being difficult to control.

The goal of this book is to present the theoretical background and practical techniques for the identification and control of sheet and film processes. The reasons why many existing industrial control systems perform poorly for sheet and film processes are explained. Identification and control algorithms which provide consistent and reliable product quality are described and illustrated. These algorithms include an experimental design technique that ensures that informative data are collected during input-output experimentation, model identification techniques that produce a process model and an estimate of its accuracy, and control techniques that take into account actuator constraints as well as robustness to model uncertainties.

The algorithms covered in this book are truly the state of the art. Variations on some of the algorithms have been implemented on industrial sheet and film processes. Other algorithms are in various stages of implementation. All of the algorithms have been applied to realistic simulation models constructed from industrial plant data; many of these studies are included in this book.

Advances in Industrial Control aims to report and encourage the transfer of technology in control engineering. The rapid development of control technology has an impact on all areas of the control discipline. The series offers an oppor
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