



Manufacturing Automation: Metal Cutting Mechanics, Machine Tool Vibrations, and CNC Design

By Yusuf Altintas

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Metal cutting is a widely used method of producing manufactured products. The technology of metal cutting has advanced considerably along with new materials, computers, and sensors. This new edition treats the scientific principles of metal cutting and their practical application to manufacturing problems. It begins with metal cutting mechanics, principles of vibration, and experimental modal analysis applied to solving shop floor problems. Notable is the in-depth coverage of chatter vibrations, a problem experienced daily by manufacturing engineers. The essential topics of programming, design, and automation of CNC (computer numerical control) machine tools, NC (numerical control) programming, and CAD/CAM technology are discussed. The text also covers the selection of drive actuators, feedback sensors, modeling and control of feed drives, the design of real time trajectory generation and interpolation algorithms, and CNC-oriented error analysis in detail. Each chapter includes examples drawn from industry, design projects, and homework problems. This book is ideal for advanced undergraduate and graduate students, as well as practicing engineers.

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Editorial Review

Review

"..provides detailed, comprehensive coverage of topics that are important to researchers, professionals, and practitioners and that have not received adequate coverage in other publications...A must read for researchers in the area of machine tool design, as well as production engineers..Highly recommended." - S.D. El Wakil, CHOICE September 2012

About the Author

Yusuf Altintas is current NSERC Pratt and Whitney Canada Research Chair in the Department of Mechanical Engineering at the University of British Columbia. He is also the Director of the Manufacturing Automation Laboratory at the University of British Columbia. He is a Fellow of CIRP (1997), ASME (1998), SME (2007), Canadian Academy of Engineers (2007), Pratt and Whitney Canada (2008), University of Tokyo (2010) and Royal Society of Canada (2010). He is the author of the first edition of Manufacturing Automation: Metal Cutting Mechanics, Machine Tool Vibrations, and CNC Design (2000).

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