

# Table of Contents

## Preface

## Chapter 1: Cutting and Drilling Technologies

|                                                                                                                                                                                               |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>Cutting Process of Rolled Ti-6Al-4V in Drilling of Countersunk Hole</b><br>S. Tamura, T. Kikuchi, K. Inazawa, H. Kondo and T. Matsumura                                                    | 3  |
| <b>Drilling Characteristics of Plastic Materials with Adaptive Control of Feed Rate</b><br>M. Okada, T. Iwahara, N. Kaneda, H. Uematsu and M. Nikawa                                          | 13 |
| <b>Multi-Quality Decision Using Preference Selection Index Method in Laser Trepan Cutting of Thin Electrical Steel</b><br>H.T. Nguyen, V.T. Nguyen, V.C. Nguyen, K.V. Nguyen and J.R. Ho      | 21 |
| <b>Influence of Axis Configuration in 5-Axis Control Machining Center on Geometric Error of Cubic Machined Surfaces</b><br>Y. Maeda, S. Sakamoto, H. Kato, R. Sato and Y. Ihara               | 31 |
| <b>Electrochemical Machining of Micro Hole under Magnetic Field Assistance</b><br>C.H. Yang, B.H. Yan, S.Y. Lin and H.P. Tsui                                                                 | 39 |
| <b>Study on Improvement of Machining Accuracy of Corner-R with Square Endmill -Effect of Constant Number of Simultaneous Cutting Edge-</b><br>Y. Igarashi, T. Ishiyama, K. Tamaki and T. Sawa | 47 |

## Chapter 2: Wear Resistance and Fatigue Behavior of Steel

|                                                                                                                                                                                                                                                                                                          |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>Fundamental Study on Influence of Residual Stress Distribution on Fatigue Strength in ns Pulsed Laser Peening for Welded High-Strength Steel</b><br>S. Okura, H. Pan, Y. Okamoto, A. Okada, Y. Sakino and T. Kato                                                                                     | 59 |
| <b>Influence of Heat Treatment on Tool Wear of High-Carbon Steel (C55)</b><br>R. Mineta and T. Sawa                                                                                                                                                                                                      | 67 |
| <b>Improvement of Prediction Reliability of Tool Edge Contour Position in Turning — Influence of Boundary Wear on Process of Dividing Roughness Curve into Feed Marks in Estimating Roughness Components</b><br>K. Taniyasu, R. Tanaka, I. Espinoza Torres, I. Martínez Ramírez, K. Sekiya and K. Yamada | 73 |
| <b>Effect of Cutting Temperature on Material Deformation and Residual Stress after Face Milling</b><br>R. Hanaki, T. Inoue, K. Somaya, H. Usuki, Y. Aoki and M. Hagino                                                                                                                                   | 81 |

## Chapter 3: Cutting Fluids

|                                                                                                                                                 |    |
|-------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>Study on Evaluation of Cutting Fluid Using End Face Cutting in Lathe Machining</b><br>Y. Obata and T. Sawa                                   | 91 |
| <b>In-Line Concentration Monitoring of Water-Soluble Cutting Fluids Using an Automatic Brix Meter</b><br>K. Yamaguchi, T. Gonda and S. Sakamoto | 99 |

## Chapter 4: Mechatronics and Automation

|                                                                                                                                                                           |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Application of Artificial Neural Network to Control Accuracy Dimension of 3D Resin DLP Products</b><br>T.H. Bui, V.V. Ma, C.Q. Han, V.V. Le and H.N. Huynh             | 109 |
| <b>A Study on the Simulation and the Experimentation to Improve the Energy Efficiency of Servo-Controlled Hydraulic System</b><br>D.H. Vu, T.H. Ho, K.D. Le and D.H. Phan | 119 |

**Lighting Simulation for Visual Inspection System Using Patterned Area Illumination**  
T. Sugino, S. Yokoyama and T. Matsuo

129

## **Chapter 5: Modeling and Computational Research in Mechanical Engineering**

**Determination of Geometrical Parameters to Balance the Pressure Drop of Channels on a Microfluidic Chip**

V.K. Dong, X.H. Tran, Q.N. Banh, A.S. Tran and H.L. Duong

141

**Swing-up and Stabilizing Control of Inverted Pendulum with Restricted Travel Width and Cart Speed**

D. Kinoshita, S. Nakayama and I. Matsumoto

151

**Empowering Die Selection in V-Bending: Insights from Decision Tree Algorithms**

H.L. Duong and H.N. Tran

161

**A Research on the Simulation of Multi-Stage Single Point Incremental Forming (MSPIF) Process on Stainless Steel Sheet SUS304 by Abacus Software**

T.L. Tran, K.D. Le, M.T. Pham, T.N. Nguyen and H.A.K. Dong

171

**Effects of Groove Depth and Sheet Thickness on V-Bending Process Predicted by Finite Element Analysis**

A.C. Le, V.K. Le, T.H. Ho, A.S. Tran, Q.N. Banh and M.T. Ho

187