

2012 IFAC Workshop on Automation in the Mining, Mineral and Metal Industries

**Gifu, Japan
10-12 September 2012**

ISBN: 978-1-62276-924-7

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2012) by Elsevier Limited
All rights reserved.

Printed by Curran Associates, Inc. (2013)

For permission requests, please contact the publisher, Elsevier Limited
at the address below.

Elsevier Limited
The Boulevard, Langford Lane
Kidlington OX5 1GB, United Kingdom

Phone: +44 (0)1865 844640
Fax: +44 (0)1865 843912

Email: eurobkinfo@elsevier.com

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Nickel Smelter Production Improvement Study Using Discrete Event Simulation.....	1
<i>Yale Zhang, Brian K. Tsang, Brandon Peterson</i>	
Energy Challenges for a Nickel Laterite Mining and Smelting Facility.....	7
<i>Brian K. Tsang, Yale Zhang</i>	
Improving Copper Matte Grade Control in a Concentrate Flash Furnace.....	13
<i>Luis Bergh, Ivan Cornejo, Fernando Romero, Cristian Sulzer</i>	
Flotation Model Based on Floatability Component Approach - PGE Minerals Case.....	19
<i>Jari Ruiska, Pertti Lamberg, Kauko Leiviska</i>	
Optimal Active Deflection Compensation of a Hot Leveler	25
<i>Michael Baumgart, Andreas Steinboeck, Andreas Kugi, Gilbert Raffin-Peyloz, Laurent Irastorza, Thomas Kiefer</i>	
Development of High Reduction Pre-Press Technique for Decreasing Crop Loss in Sizing Process	31
<i>Yohji Nakamura</i>	
Development of Practical Shape Models and Control System for Strips	33
<i>Kazutoshi Kitagoh, Naoki Shimoda, Naohiro Kubo</i>	
Frequency-Adaptive Backup-Roll Eccentricity Compensation with Force Feedback.....	39
<i>Gilberto Pin, Francesco Alessandro Cuzzola, Andrea Assalone</i>	
An Unsupervised Clustering Approach for Yield Stress Prediction During Flat Rolling	45
<i>Francesco Alessandro Cuzzola, Claudio Aurora, Daniele Scialzaro</i>	
Simple Continuous-Time Identification Method for PID Controlled Crushing Plant Processes	51
<i>Pasi Airikkala</i>	
Size Class Reduction in a Cumulative Rates Model for a Grinding Mill Circuit	57
<i>Johan Derik Le Roux, Ian Craig</i>	
Modelling, Identification and Simulation of a Double Closed-Loop Industrial Wet Grinding Circuit.....	63
<i>Moise Mukepe Kahili, Michel Kinnaert, Pierre Kalenga Ngoy, Jean-Marie Moanda Ndeko</i>	
Demand Side Management by Load Shifting a Run-Of-Mine Ore Milling Circuit	69
<i>Björn Matthews, Ian Craig</i>	
Photometric Stereo Calibration Using Constraint on Light Source Direction	75
<i>Viet Hung Nguyen, Dongyeop Kang, Sangchul Won, Yujin Jang</i>	
Phase Transformation Ratio Measurement of Steel Sheets Using Laser-Based Ultrasonics.....	81
<i>Yasuaki Nagata, Hirohisa Yamada, Shohhei Hashiguchi, Choongsoo Lim, Myoungkoo Kang, Hyunchul Park, Hyeongjun Huh, Kijang Oh</i>	
Measurement of Grain Size of Hot-Rolled Steel Sheets Using Laser-Based Ultrasonics	86
<i>Choongsoo Lim, Myoungkoo Kang, Hyunchul Park, Hyeongjun Huh, Kijang Oh, Yasuaki Nagata, Hirohisa Yamada, Shohhei Hashiguchi</i>	
Damage Detection of Bridge Using Wireless Sensors	92
<i>Koushik Roy, Harutoshi Ogai, Bishakh Bhattacharya, Samit Ray-Chaudhuri, Jianan Qin</i>	
Development of a Marking Character Reader for Specific Problems in Production Lines	97
<i>Kazuhide Hamamoto, Tsunenori Kawabata, Satoru Maeda</i>	
Development of Automated Spark Testing Technique by Image Processing to Measure Carbon Content in Steel Materials.....	103
<i>Takeo Nakata</i>	
Application for Large Scale Database-Based Online Modeling of Melting Furnace	105
<i>Yuhei Akaike, Keisuke Higashi, Norihiro Tanaka, Hidehiko Furuya, Masatoshi Ogawa, Yichun Yeh, Takaya Tokunaga, Harutoshi Ogai</i>	
Development of the New Measuring System for the Sinter Process	111
<i>Isao Nakamura, Takashi Shinohara, Masaki Yano, Masato Sugiura</i>	
Reduction in Coke Oven Heat Consumption Through Improved Fuel Valve Adjustment	117
<i>Kazuro Tsuda</i>	
Research Approaches Enabling Transformability for the Metal Forming Industry	119
<i>Markus Birkhold, Alexander Verl</i>	
Distributed Model Predictive Control of Steel Slab Reheating Furnace.....	124
<i>Xuan Manh Nguyen, Pedro Rodriguez-Ayerbe, Didier Dumur, Alain Mouchette, Fayçal Lawayeb</i>	
Flexible Coiling Temperature Control System in Hot Strip Mills.....	130
<i>Hiroyuki Imanari, Haruki Inami</i>	
Development of Interactive Scheduling System for Steel Sheet Manufacturing	136
<i>Osamu Yamaguchi, Atsushi Watamabe, Kyohei Kamiyama</i>	

On New Refining Control System for Dephosphorization Using LD Converter	138
<i>Shinji Tomiyama, Yuichi Uchida, Hiroshi Mizuno, Kengo Akiu, Takahiko Maeda</i>	
Prediction of Phosphorus Distribution Ratio between Steel and Slag in Converter Using Just-In-Time Modeling and Data-Imputation	140
<i>Shinichiro Toyoda, Nobuyuki Tomochika</i>	
Desulphurization Control System through Locally Weighted Regression Model	146
<i>Hiroyasu Shigemori</i>	
Outflow Liquid Falling Position Control by Considering Lower Ladle Position and Clash Avoidance with Mold	152
<i>Atsushi Ito, Yoshiyuki Noda, Kazuhiko Terashima</i>	
A Training Simulator of Manual Operations Around the Mould of Continuous Caster	158
<i>Hiroshi Kitada, Yoichi Muromoto, Yasuhiro Sato</i>	
Development of Scheduling System to Optimize Ship Unloading-Schedule	160
<i>Hirokazu Kobayashi, Genji Saitoh, Yasuhito Yaji, Yutaka Suzuki, Norikazu Kanazawa</i>	
An Innovative Scheduling Coordination Method for Improved Productivity and Energy Efficiency of a Large-scale Integrated Steel Plant	162
<i>Chaojun Xu, Guido Sand, Iiro Harjunkoski, Sebastian Engell</i>	
Scheduling System for Steel Plate Heat Treatment Process	168
<i>Shigeto Hojo, Naokazu Yamamura, Katsuhisa Imaizumi</i>	
Decentralized Adaptive Control of Coke Oven Batteries	170
<i>Koji Tsumura, Kazuro Tsuda, Yasumasa Fujisaki</i>	
Gray-Box Model to Control Molten Steel Temperature in Tundish	172
<i>Shota Sakashita, Toshinori Okura, Iftikhar Ahmad, Manabu Kano, Hiroshi Kitada, Noboru Murata</i>	
Sensitivity Analysis for Controlling Molten Steel Temperature in Tundish	174
<i>Noboru Murata, Sonoda Sho, Hideitsu Hino, Hiroshi Kitada, Manabu Kano</i>	
Particle Model Predictive Control of Temperature Dispersion in Steel Plate Cooling	176
<i>Kohei Ohsumi, Toshiyuki Ohtsuka, Mitsuo Hirata, Masanori Shioya</i>	
Vibration Control of a Coil Car by Using Final-State Control	178
<i>Hiroki Tanabe, Mitsuo Hirata, Masanori Shioya, Toshiyuki Ohtsuka</i>	
Closed-Loop Data-Oriented Design of a PID Controller	180
<i>Kayoko Hayashi, Toru Yamamoto</i>	
A Parameter Adjustment Method for Physics-Based Control Models with Statistical Regression	186
<i>Akira Morita, Satoru Ishihara</i>	
Parameter Identification for Systems under Disturbance	188
<i>Toru Asai, Taku Matsuo, Makishi Nakayama</i>	
Author Index	