

13th IFAC Symposium on Automation in Mining, Mineral and Metal Processing 2010

**Stellenbosch, South Africa
2 – 4 August 2010**

Editors:

**Gorden T. Jemwa
Chris Aldrich**

ISBN: 978-1-61782-869-0

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© (2010) by Elsevier Limited
All rights reserved.

Printed by Curran Associates, Inc. (2011)

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

Multivariate Specifications of Raw Materials: Application to Aluminum Reduction Cells	1
<i>J. Tessier, G. Tarcy</i>	
Model Based Fault Detection and Isolation by Fault Parameter Elimination	7
<i>B. Sohlberg, Y. Aloto, A. Erdogan, E. Erdogan</i>	
Monitoring and Control System to Falling Position of Outflow Liquid in Automatic Pouring Robot.....	13
<i>Y. Noda, R. Fukushima, K. Terashima</i>	
Nonlinear Control of Bubble Size in a Laboratory Flotation Column	19
<i>M. Maldonado, A. Desbiens, R. Villar, E. Poulin, A. Riquelme</i>	
Based on Nonlinear Disturbance Observer Approach Non-Interactive Control for Hot Rolling Mill : Experimental Validation	25
<i>H. Park, D. Jung, S. Won</i>	
Parallel Estimation Respecting Constraints of Parametric Models of Cold Rolling.....	31
<i>P. Ettler, M. Karny</i>	
Dynamic Modelling for Dense Medium Separation in Coal Beneficiation.....	37
<i>E. Meyer, I. Craig</i>	
Precise Temperatur Control In High Quality Steel Reheating And Annealing Furnaces	44
<i>M. Evestedt, P. Norberg</i>	
SDG (Signed Directed Graph) Based Process Description and Fault Propagation Analysis for a Tailings Pumping Process	50
<i>F. Yang, S. Shah, D. Xiao</i>	
Cause & Effect Analysis of Quality Deficiencies at Steel Production Using Automatic Data Mining Technologies	56
<i>H. Peters, N. Link</i>	
A GA-Optimised Ensemble Neural Network Model for Charpy Impact Energy Predictions	62
<i>M. Mahfouf, Y. Yang</i>	
A Transductive Learning Approach to Process Fault Identification	68
<i>G. Jemwa, C. Aldrich</i>	
Nonlinear Observers for Conductivity Tracking	74
<i>D. Sbarbaro, R. Pena</i>	
Fault Detection and Diagnosis with Random Forest Feature Extraction and Variable Importance Methods	79
<i>C. Aldrich, L. Auret</i>	
On-Line Monitoring of Hydrocyclones by Use of Image Analysis.....	87
<i>M. Van Vuuren, C. Aldrich, L. Auret, C. Bezuidenhoudt, C. De Jager</i>	
Robust Linear Feedback Control of Attitude for Directional Drilling Tools	92
<i>N. Panchal, M. Bayliss, J. Whidborne</i>	
Restrictions on MMM Industrial Data to Build PCA Models.....	98
<i>L. Bergh</i>	
The Relationship between Froth Image Features and Platinum Flotation Grade	104
<i>C. Marais, C. Aldrich</i>	
Control and Stabilization of a Multiple Boiler Plant: An APC Approach.....	109
<i>P. Rambalee, G. Gous, P. Villiers, N. McCulloch, G. Humphries</i>	
A Sustainable Approach to Process Optimization through Integrated Advanced Control Software Standards	115
<i>D. Clark, P. Villiers, G. Humphries</i>	
A Lean Approach To Managing Integrated Basic Control Software Standards.....	122
<i>N. Lombard, P. Villiers, G. Humphries</i>	
A Holistic Approach to the Application of Model Predictive Control to Batch Reactors.....	127
<i>A. Singh, P. Villiers, P. Rambalee, G. Gous, J. Klerk, G. Humphries</i>	
A Holistic Approach to Flotation Mass Pull and Grade Control.....	133
<i>D. Muller, P. Villiers, G. Humphries</i>	
A Holistic Approach to Control and Optimization of an Industrial Run-Of-Mine Ball Milling Circuit.....	137
<i>C. Steyn, K. Brooks, P. Villiers, D. Muller, G. Humphries</i>	
A Holistic Approach to Control and Optimisation of an Industrial Crushing Circuit	142
<i>D. Muller, P. Villiers, G. Humphries</i>	
Author Index	