

Foreword

The realization of this work has involved the intellectual and financial support of many people and institutions, to whom the author is most grateful.

Most of the research activity that led to the results summarized in this Thesis has been carried out at DIPIC, the Department of Chemical Engineering Principles and Practice of the University of Padova, under the supervision of Prof. Massimiliano Barolo and Dr. Fabrizio Bezzo. Part of the work has been conducted under the supervision of Prof. Josè A. Romagnoli, at the “Gordon A. and Mary Cain” Department of Chemical Engineering of the Louisiana State University, Baton Rouge (LA, U.S.A.).

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All the material reported in this Thesis is original, unless explicit references to the authors are provided. In the following, a list of the publications stemmed from this project is reported.

PUBLICATIONS IN INTERNATIONAL JOURNALS

Facco, P., F. Doplicher, F. Bezzo and M. Barolo (2009)

Moving-average PLS soft sensor for online product quality estimation in an industrial batch polymerization process

J. Process Control, in press. doi:10.1016/j.jprocont.2008.05.002

Faggian, A., P. Facco, F. Doplicher, F. Bezzo and M. Barolo (2009)

Multivariate statistical real-time monitoring of an industrial fed-batch process for the production of specialty chemical

Chem. Eng. Res. Des., in press. doi:10.1016/j.cherd.2008.08.019

Facco, P., R. Mukherjee, F. Bezzo, M. Barolo and J. A. Romagnoli (2009)

Monitoring Roughness and edge shape on semiconductors through multiresolution and multivariate image analysis

AIChE J., in press.

PUBLICATION IN CONFERENCE PROCEEDINGS

Facco, P., M. Olivi, C. Rebuscini, F. Bezzo and M. Barolo (2007)

Multivariate Statistical Estimation of Product Quality in the Industrial Batch Production of a Resin

Proc. DYCOPS 2007 – 8th IFAC Symposium on Dynamics and Control of Process Systems (B. Foss and J. Alvarez, Eds.), Cancun (Mexico), June 6-8, vol. 2, 93-98.

Facco, P., F. Bezzo, J. A. Romagnoli and M. Barolo (2008)

Using digital images for fast, reliable, and automatic characterization of surface quality: a case study on the manufacturing of semiconductors

In: *Workshop on nanomaterials production, characterization and industrial applications*, December 3, Milan (Italy).

Facco, P., A. Faggian, F. Doplicher, F. Bezzo and M. Barolo (2008)

Virtual sensors can reduce lab analysis requirements in the industrial production of specialty chemicals

In: *Proc. EMCC5 – 5th Chemical Engineering Conference for Collaborative Research in Eastern Mediterranean Countries*, Cetraro (CS, Italy), May 24-29, 178-181.

Facco, P., F. Bezzo, J. A. Romagnoli and M. Barolo (2008).

Monitoraggio multivariato e multiscala di processi di fotolitografia per la produzione di semiconduttori

In: *Proc. Congresso Gr.I.C.U 2008: Ingegneria Chimica, le nuove sfide*, Le Castella (KR, Italy), September 14-17, 1383-1388.

PUBLICATION IN TECHNICAL JOURNALS

Barolo, M., F. Bezzo and P. Facco (2008)

Sensori virtuali per monitorare la qualità di prodotti e processi

ICP, **36** (4), 82-84.

