# A Taxonomic Classification for Concurrent Control Chart Pattern Recognition

**Rita Peñabaena-Niebles**
Department of Industrial Engineering, Universidad del Norte, Barranquilla, Colombia
rpena@uninorte.edu.co

**Ethel Garcia**
Department of Industrial Engineering, Universidad del Norte, Barranquilla, Colombia
ethelg@uninorte.edu.co

## Abstract

The application of statistical methods for process control monitoring has become an essential activity to ensure process stability. The main objective of statistical process control is to recognize and identify the presence of abnormal control charts patterns that are disrupting the natural behavior of processes. Most studies on the subject are aimed at recognizing a single abnormal pattern at a time. However, in many industry processes is fairly common the existence of concurrent control chart patterns, which means, the occurrence of more than one abnormal control chart pattern at the same time. As a result, the following article organizes and analyzes existing information regarding concurrent control chart pattern recognition with the hope of providing a concise summary of the contributions to date and a useful guide to orientate further research. The methodological analysis follows a comprehensive classification framework whose categories were designed to assure an in-depth analysis of the most critical topics.

## Keywords
Quality Control, Statistical Process Control, Concurrent Patterns, Data Mining.

## Biographies

**Rita Peñabaena-Niebles** is an Associate Professor of Universidad del Norte, Colombia. Industrial Engineering (1995) graduated as the first of her class, Marketing Specialist (2000) and Master in Industrial Engineering (2003), Universidad del Norte, Colombia. Master of Industrial Engineering (2013), University of South Florida, USA, Ph.D. in Engineering (2015), University of Cantabria, Santander, Spain. She has experience as Professional Practice Coordinator (1995), Department Head of Industrial Engineering Program (2003) Industrial Engineering Program Coordinator (2004) and Chief Editor of the journal Ingeniería y Desarrollo (1999) from the Universidad del Norte. She has participated in several national and international projects related with Statistical Process Control, Optimization, Applied Statistics, Entrepreneurship, Industrial Design and Packaging. She has also published in major international journals and participated in national and international conferences. Experience in modeling and Multivariate Statistical Analysis, Optimization, Design of Industrial Packaging, Market Research, Energy Management, Excellence and University Management Models.

**Ethel Garcia** is a student of Master of Industrial Engineering of Universidad del Norte. Industrial Engineering (2011). She has participated in several national projects related with Statistical Process Control and Applied Statistics. She has also published in major international journals and participated in national and international conferences. Experience in modeling and Multivariate Statistical Analysis and Health Care Management.