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Carlos Felipe Alcalá Pérez

Education

Doctor of Philosophy in Chemical Engineering, *University of Southern California*. **August 2011**
Los Angeles, California.

Master of Science in Chemical Engineering, *The University of Texas at Austin*. **May 2007**
Austin, Texas.

Bachelor of Science in Chemical Engineering, *Technological Institute of Ciudad Madero*. **May 2004**
Summa Cum Laude. Ciudad Madero, Mexico.

Research Interests

Multivariate Statistical Fault Detection and Diagnosis, Data Analysis, Machine Learning, Tuning and Monitoring of PID Controllers

Experience

Senior Research Engineer, *Johnson Controls, Inc.* **Present** **October 2011**
507 E Michigan Street, M61. Milwaukee, Wisconsin, 53202. USA.

Development of methods for fault detection and diagnosis in connected chillers.

Development of methods for adaptive sampling of PID controllers.

Development of methods for monitoring the performance of PID controllers.

Research Intern, *The Dow Chemical Company*. **Summer 2010**
2301 North Brazosport Boulevard, Freeport, Texas 77541, USA.

Developed an Excel application for multivariate statistical monitoring of continuous and batch processes.

Engineering Intern, *Capstone Technology*. **Summer 2009** **Summer 2007** **Summer 2006**
8350 28th Ave NW Seattle, Washington 98117. USA.

Developed a PLS application for statistical modeling of chemical processes.

Developed a multivariate image analysis application to monitor combustion efficiency in furnaces.

Developed a PCA application for detection and diagnosis of sensor and process faults.

Engineering Intern, *NMC North Microelectronics*. **Summer 2008**
No.1 East Jiuxianqiao Rd., Chaoyang Dist., Beijing 100016, China

Developed a PCA application for monitoring the operation of a semiconductor manufacturing process.

Academic Honors

USC, 2007, 2010: Roberto Rocca Education Program Fellowship

Texas, 2005: Fulbright Scholarship

Computer skills

Languages: R, Matlab, LaTeX, Markdown, Python, C#, Modelica, VB.NET, VBA

Applications: Sublime Text, RStudio, Matlab, Simulink, Dymola, MS Office

Patents

Granted

Carlos Felipe Alcala Perez, Timothy I. Salsbury. "Systems and methods for adaptive sampling rate adjustment". Patent US 20140257528. September 11, 2014. Source: US20140257528

Filed

Carlos Felipe Alcala Perez. "Building management system with voting-based fault detection and diagnosis.". Filed on June 2015.

Timothy I. Salsbury, Carlos F. Alcala. "Normalized indices for feedback control loops.". Filed on August 2014.

Publications

Journal Papers

Carlos F. Alcala and S. Joe Qin. Reconstruction-Based Contribution for Process Monitoring. *Automatica*, 2009 (45), 1596-1600. DOI: 10.1016/j.automatica.2009.02.027

Carlos F. Alcala and S. Joe Qin. Reconstruction-Based Contribution for Process Monitoring with Kernel Principal Component Analysis. *Industrial Engineering and Chemistry Research*. 2010 (49), 7849-7857. DOI: 10.1021/ie9018947.

Gang Li, Carlos F. Alcala, S. Joe Qin and Donghua Zhou. Generalized Reconstruction-Based Contributions for Output-Relevant Fault Diagnosis With Application to the Tennessee Eastman Process. *IEEE Transactions on Control Systems Technology*. 2010. DOI: 10.1109/TCST.2010.2071415.

Carlos F. Alcala and S. Joe Qin. Analysis and Generalization of Fault Diagnosis Methods for Process Monitoring. *Journal of Process Control*. 2011 (21), 322-330. DOI: 10.1016/j.jprocont.2010.10.005

Conference Papers

Timothy I. Salsbury and Carlos F. Alcala. Two New Normalized EWMA-based Indices for Control Loop Performance Assessment. *In Proceedings of the 2015 American Control Conference*, Chicago, Illinois, July 2015.

Carlos F. Alcala and S. Joe Qin. Unified Analysis of Diagnosis Methods for Process Monitoring. *In Proceedings of the* 7^{th} *IFAC SafeProcess Symposium*, Barcelona, Spain, July 2009.

Carlos F. Alcala and S. Joe Qin. Unification of Contribution Analysis for Process Monitoring. *In Proceedings of the AIChE Annual Meeting*, Philadelphia, November 2008.

Carlos Alcala and S. Joe Qin. Reconstruction-Based Contribution for Process Monitoring, *In Proceedings of the* 17^{th} *IFAC World Congress*, Seoul, Korea, July 2008.