Carlos Felipe **Alcala Perez**

Data Scientist

Milwaukee, WI.

☎ (+1) 414-426-6814 | ✉ alcala21@gmail.com | ⬡ alcala21 | 🔗 alcala21 | 🎓 Carlos F. Alcala

Work Experience

Johnson Controls International
Milwaukee, WI

Principal Research Engineer

Dec. 2017 - Jan. 2018

- I used advanced optimization and data analytics methods to improve the efficiency of heating, ventilation and air conditioning (HVAC) systems.
- I was involved in the transfer of newly developed technology into products and applications.

Johnson Controls International
Milwaukee, WI

Senior Research Engineer

May 2015 - Dec. 2017

- I developed methods for monitoring the performance of PID controllers, to detect steady state operation of HVAC equipment, and reduce energy consumption in wireless thermostats while keeping acceptable comfort standards. I used advanced mathematical tools to develop these methods, as well as artificial intelligence, machine learning and traditional statistical methods.

Johnson Controls BE Servicios
Mexico City, Mexico

Senior Research Engineer

Jan. 2013 - May 2015

- I developed data-driven methods for fault detection and diagnosis in connected chillers.

Johnson Controls, Inc.
Milwaukee, WI

Senior Research Engineer

Oct. 2011 - Jan. 2013

- I developed a method for adaptive sampling of PID controllers.

The Dow Chemical Company
Freeport, TX

Summer Research Intern

May 2010 - Aug. 2010

- I developed an Excel application for multivariate statistical monitoring of continuous and batch processes.

Capstone Technology
Seattle, WA

Summer Engineering Intern

May 2009 - Aug. 2009

- I developed a multivariate image analysis application to monitor combustion efficiency in furnaces.

NMC North Microelectronics
Beijing, China

Summer Engineering Intern

Jun. 2008 - Jul. 2008

- I developed a multivariate statistical application for monitoring the operation of a semiconductor manufacturing process.

Capstone Technology
Seattle, WA

Summer Engineering Intern

May 2007 - Aug. 2007

- I developed a multivariate statistical application for statistical modeling and prediction in chemical processes.

Capstone Technology
Seattle, WA

Summer Engineering Intern

May 2006 - Aug. 2006

- I developed a multivariate statistical application for detection and diagnosis of sensor and process faults.

Education

University of Southern California
Los Angeles, CA

Doctor of Philosophy in Chemical Engineering

Aug. 2007 - Aug. 2011

- I was awarded a Roberto Rocca Fellowship to do my PhD studies.

The University of Texas at Austin
Austin, TX

Master of Science in Chemical Engineering

Aug. 2005 - May 2007

- I was awarded a Fulbright scholarship to do my Masters degree.

Instituto Tecnologico de Ciudad Madero
Ciudad Madero, Mexico

Bachelor of Science in Chemical Engineering

Aug. 1999 - Dec 2003

- Graduated Summa Cum Laude.

Certifications

Duke University *Coursera*
STATISTICS WITH R *Oct. 29, 2018*
Credential ID: UWG3PS5EXMBJ

University of Washington *Coursera*
MACHINE LEARNING *Feb. 1, 2017*
Credential ID: 2VHFDHW5GUK6

Johns Hopkins University *Coursera*
DATA SCIENCE *Apr. 20, 2016*
Credential ID: W9DB45S3CGDZ

Publications

Patents

Control system with response time estimation and automatic operating parameter adjustment
Carlos F. Alcala Perez, Timothy I. Salsbury
US Patent 10324424, 2019

Control system with asynchronous wireless data transmission
Carlos F. Alcala Perez, Kirk H. Drees
US Patent 10333810, 2019

Building climate control system with decoupler for independent control of interacting feedback loops
Timothy I. Salsbury, Carlos F. Alcala Perez, John M. House, Christopher R. Amundson
US Patent 10253997, 2019

Building management system with voting-based fault detection and diagnostics
Carlos F. Alcala Perez
US Patent 10401262, 2019

Control system with response time estimation
Carlos F. Alcala Perez, Timothy I. Salsbury
US Patent 10317856, 2019

Feedback control system with normalized performance indices for setpoint alarming
Timothy I. Salsbury, Carlos F. Alcala Perez, Michael J. Ajax
US Patent 10197977, 2019

System and method for output compensation in flow sensors using pulse width modulation
Carlos F. Alcala Perez, Kirk H Drees, Timothy I Salsbury
US Patent App. 15/908,041, 2018

System and method for output compensation in flow sensors
Carlos F. Alcala Perez, Kirk H Drees
US Patent App. 15/897,987, 2018

Normalized indices for feedback control loops
Timothy I. Salsbury, Carlos F. Alcala Perez
US Patent 9920943, 2018

Thermostat with efficient wireless data transmission
Timothy I Salsbury, Carlos F. Alcala Perez, Homero L Noboa
US Patent App. 15/618,492, 2017

Building control system with decoupler for independent control of interacting feedback loops
Timothy I Salsbury, Carlos F. Alcala Perez, John M House, Christopher R Amundson
US Patent App. 16/253,965, 2017

Systems and methods for steady state detection
Carlos F. Alcala Perez
US Patent App. 15/449,732, 2017

Systems and methods for automatically creating and using adaptive pca models to control building equipment
Carlos F. Alcala Perez
US Patent App. 15/279,336, 2016

Systems and methods for adaptive sampling rate adjustment
Carlos F. Alcala Perez, Timothy I. Salsbury
US Patent 9395708, 2016

Building management system with predictive diagnostics
   Carlos F. Alcala Perez, Samuel F. Hamilton
   US Patent App. 15/188,824, 2016

Journal Papers

A method for setpoint alarming using a normalized index
   Carlos F. Alcala, Timothy I. Salsbury
   Control Engineering Practice *60.3 (2017) pp. 1–6. 2017*

An extremum-seeking control method driven by input–output correlation
   Timothy I Salsbury, John M House, Carlos F Alcala, Yaoyu Li
   Journal of Process Control *58 (2017) pp. 106–116. Elsevier, 2017*

Analysis and generalization of fault diagnosis methods for process monitoring
   Carlos F. Alcala, S. Joe Qin
   Journal of Process Control *21.3 (2011) pp. 322–330. 2011*

Generalized reconstruction-based contributions for output-relevant fault diagnosis with application to the tennessee eastman process
   Gang Li, Carlos F. Alcala, S. Joe Qin, Donghua Zhou
   Control Systems Technology, IEEE Transactions on *19.5 (Sept. 2011) pp. 1114–1127. 2011*

Reconstruction-based contribution for process monitoring with kernel principal component analysis
   Carlos F. Alcala, S. Joe Qin
   Industrial & Engineering Chemistry Research *49.17 (2010) pp. 7849–7857. 2010*

Reconstruction-based contribution for process monitoring
   Carlos F. Alcala, S. Joe Qin
   Automatica *45.7 (2009) pp. 1593–1600. 2009*

Conference Papers

Self-optimizing Control of an Air Source Heat Pump
   Zhongfan Zhao, Yaoyu Li, Timothy I Salsbury, Carlos F Alcala, John M House
   2019 American Control Conference (ACC), 2019

Identification of a Self-Optimizing Control Structure from Normal Operating Data
   Carlos F Alcala, Timothy I Salsbury, John M House
   2019 American Control Conference (ACC), 2019

Decoupling Method for PI Controllers via Setpoint Modification Applied to HVAC Systems
   Timothy I Salsbury, John M House, Carlos F Alcala
   ASME 2018 Dynamic Systems and Control Conference, 2018

Reduction of Transmissions in Wireless Thermostats with Send-on-Delta Sampling and a Deadband Filter
   Carlos F Alcala, Timothy I Salsbury
   2018 Annual American Control Conference (ACC), 2018

Decoupling Method for PI Controllers via Setpoint Modification Applied to HVAC Systems
   Timothy I. Salsbury, John M. House, Carlos F. Alcala
   Proceedings of the Dynamic Systems and Control Conference, 2018

Reduction of Transmissions in Wireless Thermostats with Send-on-Delta Sampling and a Deadband Filter
   C. F. Alcala, T. I. Salsbury
   Proceedings of the 2018 Annual American Control Conference (ACC), 2018

Model Selection for Predicting the Return Time from Night Setback
   John E Seem, John M House, Carlos F Alcala
   Proceedings of the International High Performance Buildings Conference, 2016

Two new normalized EWMA-based indices for control loop performance assessment
   Timothy I. Salsbury, Carlos F. Alcala
   Proceedings of the American Control Conference (ACC), 2015

Monitoring of dynamic processes with subspace identification and principal component analysis
   Ricardo Dunia Carlos F. Alcala, S. Joe Qin

Proceedings of the 8th IFAC International Symposium on Fault Detection, Supervision and Safety of Technical Processes, 2012, Mexico City, Mexico

Unified analysis of diagnosis methods for process monitoring
Carlos F. Alcala, S. Joe Qin
Proceedings of the 7th IFAC International Symposium on Fault Detection, Supervision and Safety of Technical Processes, 2009, Barcelona, Spain

Unification of contribution analysis for process monitoring
Carlos F. Alcala, S. Joe Qin
Proceedings of the 2008 AIChE Annual Meeting, 2008, Philadelphia, USA

Reconstruction-based contribution for process monitoring
Carlos Alcala, S. Joe Qin
Proceedings of the 17th IFAC World Congress, 2008, Seoul, Korea