

Dates (from .. to..)	01/08/2013 – 31/12/2013
Name and address of the Employer (Public or/and private institution/body)	University of California, Berkeley, CA, USA
Position held (for positions in Universities, the candidate should indicate the Faculty/College/School and the Department)	Visiting Scholar Department of Electrical Engineering and Computer Sciences
Main activities/responsibilities	Research activities on applications of systems and control theories in smart-grids, demand response and optimization of electric markets.
Dates (from .. to..)	01/01/2010 – 31/12/2014
Name and address of the Employer (Public or/and private institution/body)	Pontificia Universidad Javeriana Carrera 7 No. 40 – 62, Bogotá, (Colombia)
Position held (for positions in Universities, the candidate should indicate the Faculty/College/School and the Department)	Assistant professor Department of electronics engineering School of Engineering
Main activities/responsibilities	Teaching and research activities. Planning and teaching of courses on control systems, advising of master and undergraduate students in the development of their theses and capstone projects, formulation and development of research projects.

Education and Training (please use the following table to describe Degrees awarded, by only indicating the information concerning Bachelor's Degree, Master of Science's Degree or/and PhD)

Date	02/2009
Institution which issued the degree	Politecnico di Torino
Type of Degree awarded (only Bachelor's Degree, Master of Science's Degree, PhD)	Phd
Date	04/2006
Institution which issued the degree	Pontificia Universidad Javeriana
Type of Degree awarded (only Bachelor's Degree, Master of Science's Degree, PhD)	Master of Science
Date	09/2002
Institution which issued the degree	Pontificia Universidad Javeriana
Type of Degree awarded (only Bachelor's Degree, Master of Science's Degree, PhD)	Bachelor of Science

EVALUATION FIELDS

1. Scientific Activity

- The three most important outcomes/results of the research activity of the candidate accompanied by the tangible and verifiable evidence that the presented results:
 1. J. Vuelvas; F. Ruiz; “Rational consumer decisions in a peak time rebate program”, *Electric Power Systems Research*, Vol. 143, Pg. 533-543, Feb. 2017, ISSN 0378-7796.
 2. C. Novara; F. Ruiz; M. Milanese; "Direct Filtering: A New Approach to Optimal Filter Design for Nonlinear Systems," *Automatic Control, IEEE Transactions on*, Vol. 58 No. 1 Pg. 86-99, Jan. 2013, ISSN 0018-9286.
 3. M. Milanese; F. Ruiz; M. Taragna; “Direct data-driven filter design for uncertain LTI systems with bounded noise”, *Automatica*, vol. 46, no. 11, pp. 1773-1784, Nov. 2010, ISSN 0005-1098.

- List of the submitted publications (with a maximum number of 20) in addition to those listed at point 1.1. For each publication and/or set of publications, the candidate is required to briefly describe his/her contribution, their scientific/technical significance and individual importance, the overall impact of the results in the international scientific community.

- 1. I have developed a framework for the analysis of consumer behavior in demand response programs. The models can be employed in the design of novel strategies in demand side management. The results have been obtained with participation of PhD students and professor Diego Patiño of Universidad Javeriana. The following publications evidence the results:
 - a. C Diaz, F Ruiz, D Patiño; “Modeling and control of water booster pressure systems as flexible loads for demand response”; *Applied Energy*, Vol. 204, Pg. 106-116, Oct. 2017, ISSN: 0306-2619.
 - b. Vuelvas, J.; Ruiz, F.; “Demand response: Understanding the rational behavior of consumers in a Peak Time Rebate Program”, *IEEE 2nd Colombian Conference on Automatic Control (CCAC)*, Manizales, Colombia, October 2015.

- 2. I have developed a framework for the design of optimal filters from data in lineal and non-linear systems. The results have been obtained during my PhD and then in cooperation with professors Novara, Taragna and Milanese from Politecnico di Torino. The following publications evidence the results:
 - a. C. Novara; F. Ruiz; M. Milanese; “Direct Identification of Optimal SM-LPV Filters and Application to Vehicle Yaw Rate Estimation”, *Control Systems Technology, IEEE Transactions on*, vol.19, no.1, pp.5-17, Jan. 2011, ISSN 1063-6536.
 - b. F. Ruiz; C. Novara; M. Milanese; “Direct design from data of optimal filters for LPV systems”, *Systems & Control Letters*, vol. 59, no. 1, Jan. 2010, pp. 1-8, ISSN 0167-6911.
 - c. M. Canale; L. Fagiano; F. Ruiz; M.C. Signorile; “Vehicle stability control using direct virtual sensors”, *Vehicle System Dynamics*, vol. 50, no. 4, pp. 597 – 618, April 2012, ISSN: 0042-3114.

- 3. I have developed a methodology for the use of Set-Membership techniques in black-box modeling of non-linear processes. The methodology has been applied for controller design in biotechnology, power electronics, mechatronic systems, among others. The results have been obtained with participation of PhD and Master students of Pontificia Universidad Javeriana. The following publications evidence the results:
 - a. J.A. Castaño; F. Ruiz; “Set Membership identification of an Excimer Lamp for Fast Simulation”, *Control Engineering Practice*, Vol. 21, No. 1, Jan. 2013, Pg. 96-104, ISSN 0967-0661.

- b. Hernandez A.; Ruiz F.; Desideri A.; Ionescu C.; Quoilin S.; Lemort V.; De Keyser R., "Nonlinear identification and control of Organic Rankine Cycle systems using sparse polynomial models," 2016 IEEE Conference on Control Applications (CCA), Buenos Aires, Argentina, 2016, pp. 1012-1017.
- c. Ruiz, F.; Sanchez, F.; Arevalo, H.; Almeciga-Diaz, J.; Rodriguez-Lopez, A.; "A set membership approach to oxygen transport modeling with unmodeled dynamics", IEEE 2nd Colombian Conference on Automatic Control (CCAC), Manizales, Colombia, October 2015.
- d. Valderrama F.; Ruiz F., "Controller Design from Data under UBB Noise", 2014 American Control Conference, pp. 5103-5108, Portland, OR, USA, 4 – 6 June 2014.

- Complete list of all the significant publications of the candidate, including those listed at points 1.1 and 1.2 (to be attached to the end of the Curriculum).
A list of publications is included at the end.

2. Coordination of research and technology transfer groups and projects.

- Head of research group CEPIT. Coordinator of the research activities of the group on Control systems and power electronics at Pontificia Universidad Javeriana. July 2010-July 2013.
- Principal investigator (PI) in 4 national projects funded by Pontificia Universidad Javeriana:
 - "Automatic control of Dissolved oxygen concentration in a bioreactor", 2010-2012.
 - "In-Silico Model-Based Recombinant Protein Production Optimization in Pichia Pastoris". 2013-2015.
 - "Non-Invasive Degradation estimation method for Photovoltaic panels." 2015-2016.
 - "Portable soil-nutrient analyzer for agriculture applications", 2017-2018.
- Co-Investigator in 5 national projects funded by national agencies:
 - "Energy management system for renewable sources and storage integration". 2016-2018.
 - "Universal Access to Electricity". 2017-2018. in association with EarthSpark (NGO).
 - "Sustainable Strategies in Electric Energy Usage for Vulnerable Population of Cundinamarca". 2015-2018. in association with Codensa-Enel group.
 - "Robotic platform for pipelines supervision and Repair". 2013-2016. In association with H&U (Colombian company).
 - "Stability and Control Strategies in Hybrid Dynamic Systems". 2015-2017. In association with INSA-Lyon.
- Academic advisor of 5 PhD students. 2 are now in 3rd year, 2 in 2nd year and 1 in 1st year.
- Academic supervisor of 1 Post-Doc. March 2015 – February 2016.

3. National and international reputation and professional activity for the scientific community

4. IEEE (Institute of Electrical and Electronics Engineers). Senior Member since 2013, Professional member since 2009. Student Member since 1999.
5. IEEE Control Systems Society. Professional member since 2009. Student Member since 1999.
6. IEEE Control Systems Society – Colombian Chapter. Vice-chair Technical Activities since Nov. 2011.

7. IEEE Colombian Conference on Automatic Control (CCAC 2011). Member of the Technical program committee in 2011 (Tutorials Chair), 2015 (program chair) and 2017 (Tutorials Chair).
8. Reviewer for international journals and conferences: Automatica, IEEE Transactions on Automatic Control, IEEE Transactions on Control Systems Technology, International Journal of Adaptive Control and Signal Processing, Mechanical Systems and Signal Processing, Autonomous Robots, Environmental Modelling & Software. American Control Conference, Conference on Decision and Control, IFAC World Congress, IFAC Symposium on System Identification. Andean Region International Conference.
9. IEEE - ANDESCON 2010, Andean Region International Conference. Tutorial “Foundations of Robust Control”, Bogotá, Colombia, 14 Sept. 2010.

If the candidate has obtained the National Scientific Qualification in more than one Academic Field this must be considered a qualifying element, for properly evaluating the scientific reputation of the candidate.

10. Teaching activity

- UNDERGRADUATE COURSES TAUGHT
 - Dynamic systems
 - Automatic control
 - Automatic Control laboratory
 - Electronic design project I
 - Electronic design project II
- GRADUATE (Master and PhD) COURSES TAUGHT
 - Linear systems
 - System identification
 - Robust control
 - Optimization Techniques

11. Institutional offices and roles in Italian and foreign Universities and/or public and private institutions with scientific and/or technology transfer aims

- Chair of the electronics engineering department. Manage the teaching and research activities of the Department. Lead the development of projects proposals, faculty selection and curriculum development. Chair the Academic committee of the department. January 2014 – January 2017.
- Academic Member of the National Council of Science, Technology and Innovation in Homeland Security and Defense, March 2015-Onwards.
- Coordinator of the automatic control area. Design the undergraduate and graduate programs emphasis in automatic control. Define and coordinate the courses in control and automation. Participate in the academic committee of the department. Selection of part-time professors. March 2010-July 2013.

Place and date _____

Complete list of significant publications

Publications on International Journals

1. C Diaz, F Ruiz, D Patiño; “Modeling and control of water booster pressure systems as flexible loads for demand response”; *Applied Energy*, Vol. 204, Pg. 106-116, Oct. 2017, ISSN: 0306-2619.
2. J. Vuelvas; F. Ruiz; “Rational consumer decisions in a peak time rebate program”, *Electric Power Systems Research*, Vol. 143, Pg. 533-543, Feb. 2017, ISSN 0378-7796.
3. J. Orozco; Y. Bello; D. Patino; J. Colorado; F. Ruiz; L. Solaque; “Nonlinear control of a robotic arm for pipeline reparation”, *IEEE Latin America Transactions*, Vol. 14, No. 12, Pg. 4680-4686, Dic. 2016, ISSN 1548-0992.
4. J.A. Castaño; F. Ruiz; “Set Membership identification of an Excimer Lamp for Fast Simulation”, *Control Engineering Practice*, Vol. 21, No. 1, Jan. 2013, Pg. 96-104, ISSN 0967-0661.
5. C. Novara; F. Ruiz; M. Milanese; "Direct Filtering: A New Approach to Optimal Filter Design for Nonlinear Systems," *Automatic Control, IEEE Transactions on*, Vol. 58 No. 1 Pg. 86-99, Jan. 2013, ISSN 0018-9286.
6. M. Canale; L. Fagiano; F. Ruiz; M.C. Signorile; “Vehicle stability control using direct virtual sensors”, *Vehicle System Dynamics*, vol. 50, no. 4, pp. 597 – 618, April 2012, ISSN: 0042-3114.
7. C. Novara; F. Ruiz; M. Milanese; “Direct Identification of Optimal SM-LPV Filters and Application to Vehicle Yaw Rate Estimation”, *Control Systems Technology, IEEE Transactions on*, vol.19, no.1, pp.5-17, Jan. 2011, ISSN 1063-6536.
8. M. Milanese; F. Ruiz; M. Taragna; “Direct data-driven filter design for uncertain LTI systems with bounded noise”, *Automatica*, vol. 46, no. 11, pp. 1773-1784, Nov. 2010, ISSN 0005-1098.
9. F. Ruiz; C. Novara; M. Milanese; “Direct design from data of optimal filters for LPV systems”, *Systems & Control Letters*, vol. 59, no. 1, Jan. 2010, pp. 1-8, ISSN 0167-6911.

Publications on National Journals

1. F. Ruiz; C. Cotrino; “Identifying a greenhouse climate model by using subspace methods”, *Ingeniería e Investigación*, vol. 30, no. 2, pp. 157-167, Aug. 2010, ISSN 0120-5609.
2. K. Hay, G. Perrilla, C. Cotrino, F. Ruiz, “Función de transferencia para un rectificador con factor de potencia unitario, en configuración de medio puente, controlador por DSP”, *Ingeniería Y Universidad*, vol. 9, no. 1, 2005, ISSN: 0123-2126.

Book Chapters

1. Milanese, Mario; Ruiz, F; Taragna, Michele; From Model-Based to Data-Driven Filter Design, in "Bounded Noises in Physics, Biology, and Engineering", pp. 273-285, 2013, Springer New York.

Publications on International Conference Proceedings

2. Guavita, J.; Diez, R.; Patiño, D.; Ruiz, F.; Perilla, G.; “Self-balancing control strategy for a battery based H-bridge multilevel inverter”; *Power Electronics and Power Quality Applications (PEPQA), 2017 IEEE Workshop on*; Bogotá, Colombia, May, 2017.
3. Hernandez A.; Ruiz F.; Desideri A.; Ionescu C.; Quoilin S.; Lemort V.; De Keyser R., "Nonlinear identification and control of Organic Rankine Cycle systems using sparse polynomial models," 2016 IEEE Conference on Control Applications (CCA), Buenos Aires, Argentina, 2016, pp. 1012-1017.

4. Vuelvas, J.; Ruiz, F.; "Demand response: Understanding the rational behavior of consumers in a Peak Time Rebate Program", IEEE 2nd Colombian Conference on Automatic Control (CCAC), Manizales, Colombia, October 2015.
5. Ruiz, F.; Sanchez, F.; Arevalo, H.; Almeciga-Diaz, J.; Rodriguez-Lopez, A.; "A set membership approach to oxygen transport modeling with unmodeled dynamics", IEEE 2nd Colombian Conference on Automatic Control (CCAC), Manizales, Colombia, October 2015.
6. Valderrama F.; Ruiz F., "Controller Design from Data under UBB Noise", 2014 American Control Conference, pp. 5103-5108, Portland, OR, USA, 4 – 6 June 2014.
7. Lopez, S.; Muñoz J.; Ruiz F., "Comparative Analysis of Non-Linear Filters for Attitude Estimation in a Low-Cost Inertial Station" II Congreso Internacional de Ingeniería Mecatrónica y Automatización, Bogotá. Colombia 23-25 Oct. 2013.
8. Novara, C.; Ruiz, F.; Milanese, M., "Robustly optimal filter design for nonlinear systems," Decision and Control (CDC), 2012 IEEE 51st Annual Conference on , pp.6761,6766, 10-13 Dec. 2012.
9. Martinez, Daniel; Ruiz, Fredy; ,Nonlinear model predictive control for a Ball&Beam,"Circuits and Systems (CWCAS), 2012 IEEE 4th Colombian Workshop on", 1-5,2012.
10. Cheguini, Mazeyar; Ruiz, Fredy; Real-time attitude estimation based on Gradient Descent algorithm," Circuits and Systems (CWCAS), 2012 IEEE 4th Colombian Workshop on", 1-6,2012.
11. Ruiz F.; Vuelvas J.; Novara C.; "LPV Model Identification for a Web Winding System", 16th IFAC Symposium on System Identification SYSID, Brussels, Belgium, 11-13 Jul. 2012.
12. Jimenez, L.C.; Ruiz, F.; "Uncertainty model analysis for MISO systems Set-Membership identification," Robotics Symposium, 2011 IEEE IX Latin American and IEEE Colombian Conference on Automatic Control and Industry Applications (LARC), Bogota, Colombia, 1-4 Oct. 2011.
13. Vuelvas, J.; Urrego, J.; Ruiz, F.; "Multivariable estimation of a web winding system," Robotics Symposium, 2011 IEEE IX Latin American and IEEE Colombian Conference on Automatic Control and Industry Applications (LARC), Bogota, Colombia, 1-4 Oct. 2011.
14. Medina, J.; Ruiz, F.; "Cascade monitoring of temperature and dissolved oxygen in the growth of pichia pastoris in a bioreactor," Robotics Symposium, 2011 IEEE IX Latin American and IEEE Colombian Conference on Automatic Control and Industry Applications (LARC), Bogota, Colombia, 1-4 Oct. 2011.
15. Vuelvas, J.; Urrego, J.; Ruiz, F.; , "A methodology for LPV control of web winding systems," Robotics Symposium, 2011 IEEE IX Latin American and IEEE Colombian Conference on Automatic Control and Industry Applications (LARC), Bogota, Colombia, 1-4 Oct. 2011.
16. Castaño, J.A.; Ruiz, F.; Régnier, J., "A Fast Approximation Algorithm for Set Membership System Identification", 18th IFAC World Congress, Milano, Italy, Aug. 2011.
17. Novara, C; Ruiz, F.; Milanese, M.; "A New Approach to Optimal Filter Design for Nonlinear Systems", 18th IFAC World Congress, Milano, Italy, Aug. 2011.
18. Flórez, D.; Díez, R.; Hay, A.K.; Perilla, G.; Ruiz, F.; Piquet, H.; , "Programmable current converter synthesis for the evaluation of UV radiation of excimer lamps," ANDESCON, 2010 IEEE, Bogota, Colombia, 15-17 Sept. 2010.
19. Quintana, R.; Patino, D.; Ruiz, F.; "Fast estimation of acoustic parameters in presence of audience," ANDESCON, 2010 IEEE, Bogota, Colombia, 15-17 Sept. 2010.
20. Castaño, J.A.; Ruiz, F.; "Computational evaluation of an orthogonal basis nonlinear system identification method," ANDESCON, 2010 IEEE, Bogota, Colombia, 15-17 Sept. 2010.
21. Patino, D.; Riedinger, P.; Ruiz, F.; "A predictive control approach for DC-DC power converters and cyclic switched systems," Industrial Technology (ICIT), 2010 IEEE International Conference on, Viña del Mar, Chile, 14-17 March 2010.
22. Novara C.; F. Ruiz; M. Milanese, "A new approach to optimal filter design for nonlinear systems", 48th IEEE Conference on Decision and Control, Shanghai, China, 16-18 Dec. 2009.
23. Ruiz F; Taragna M.; Milanese M, "Direct data-driven filter design for automotive controlled suspensions", European Control Conference ECC'09, Budapest, Hungary, 23-26 Aug. 2009.
24. Novara C.; Ruiz F; Milanese M, "A simple approach to direct LPV filter design from data for nonlinear systems", 15th IFAC Symposium on System Identification SYSID, Saint-Malo, France, 6-8 July 2009.
25. Milanese M; Ruiz F; Taragna M., "Direct data-driven filter design for uncertain LTI systems with bounded noise", 15th IFAC Symposium on System Identification SYSID, Saint Malo, France, 6-8 July 2009.

26. Novara C.; Ruiz F; Milanese M, "Direct identification of optimal filters for LPV systems", 47th IEEE Conference on Decision and Control, Cancun, Mexico, 9-11 Dec. 2008.
27. M. Canale; Fagiano L.; F. Ruiz; M. C. Signorile, "A Study on the use of Virtual Sensors in Vehicle Control", 47th IEEE Conference on Decision and Control, Cancun, Mexico, 9-11 Dec. 2008.
28. Novara C.; Ruiz F; Milanese M, "Direct design of optimal filters from data", 17th IFAC World Congress, Seoul, Korea, 6-11 July 2008.
29. Canale M; Fagiano L.; F. Ruiz; M. C. Signorile, "On the design of linear virtual sensors for low cost vehicle stability control", 2nd IEEE Multi-conference on Systems and Control, San Antonio (TX), USA, 2008.
30. Milanese M; Ruiz F.; Taragna M, "Linear virtual sensors for vertical dynamics of vehicles with controlled suspensions", European Control Conference ECC'07, Kos, Greece, July 2007.
31. Milanese M; Ruiz F.; Taragna M, "Virtual sensors for linear dynamic systems: structure and identification", 3rd International IEEE Scientific Conference on Physics and Control, Potsdam, Germany, Sept. 2007.
32. Guzmán H., Roa C., Ruiz F., Rizo J., Coronado J., Parra C.; "Frequency Driven Metal Detector for Humanitarian Demining", ANDESCON, 2004 IEEE, Bogota, Colombia, Aug. 2004.
33. S. Rodríguez, F. Villate, F. Ruiz. "A Systems Dynamics and Control Laboratory", ANDESCON, 2004 IEEE, Bogota, Colombia, Aug. 2004.