Nicanor Quijano

Universidad de los Andes
Carrera 1Este # 19A-40, Edificio Mario Laserna
Departamento de Ingeniería Eléctrica y Electrónica
Bogotá, Colombia
Tel: (57)-1-3394949, Ext 3631
Cel: (57)-313-809-5894
Email: nquijano@uniandes.edu.co
Web*: http://wwwprof.uniandes.edu.co/~nquijano/

Objective

To pursue a successful career as a professor and researcher in the field of Controls, Signal Processing, and Systems Biology that would utilize my technical, professional, and personal skills.

Education

***Ph.D. in Electrical and Computer Engineering*, The Ohio State University, Columbus, Ohio, USA**
Major: Controls and Signal Processing
Thesis: "The Ideal Free Distribution: Theory and Engineering Application"
Advisor: Kevin M. Passino
Graduated: Dec '06

***M.S. in Electrical Engineering*, The Ohio State University, Columbus, Ohio, USA**
Major: Controls and Signal Processing
Thesis: "Experiments and technologies for decentralized temperature control"
Advisor: Kevin M. Passino
Graduated: Dec '02

***B.S in Electronics Engineering*, Pontificia Universidad Javeriana, Bogotá, Colombia**
B.S. Project: "Simulador digital para control y evaluación de procesos industriales"
Advisor: Asdrúbal Espitia
Graduated: Oct '99

Awards & Honors

- ***Nomination for best B.S. Project**, Aug. 1999, Pontificia Universidad Javeriana, Bogotá-Colombia.*
- ***Best design project in the category of microcontrollers**, Expoelectrónica, Nov. 1998, Pontificia Universidad Javeriana, Bogotá-Colombia.*

* Below all underlined text is clickable and will provide relevant additional information.

Experience

Assistant Professor (Universidad de los Andes)
Jan'07 – present

- Currently I am an assistant professor at the Departamento de Ingeniería Eléctrica y Electrónica, Universidad de los Andes, Bogotá, Colombia. I am teaching courses in Feedback Control Theory, Nonlinear Systems, and Intelligent Control.
- I am the director of the research group in control and automation, GIAP.

Graduate Research Associate (The Ohio State University)
Jul '01 – Dec'06

- In my PhD I worked in the Electrical and Computer Engineering Department with Professor Kevin M. Passino. In my research we focused on how to use biomimicry of the evolution of the Ideal Free Distribution (IFD) for constructing distributed feedback control systems. The main research areas used were Evolutionary Game Theory, Optimization Theory, and Stability Analysis. Also, we worked on a physical experiment that helps as a testbed for the implementation of the theory.
- In my M.S. thesis, I worked with Professor Kevin M. Passino on a "**Uniform Planar Temperature Control over a Network.**" The experiment consists of 16 individually controlled zones. The idea is to regulate the temperature to be uniform across the grid using centralized and decentralized controllers. Some of the applications are temperature control in industry and control over the internet. Also, I developed some of the Real-Time Control System (RCS) features in LabVIEW and dSPACE, including experimental demonstrations. This project was funded by the National Institute of Standards and Technology (NIST).
- During the Wi'02 and Sp'02 quarters I worked with Professor Kevin M. Passino to develop hardware experiments operation manuals, and a complete set of laboratory exercises for **ECE758** "Control System Implementation Laboratory."
- I worked with Alvaro E. Gil and Professor Kevin M. Passino on the design, development and test of experiments for hierarchical, decentralized and networked dynamic resource allocation, scheduling, and control. Control strategies have already been implemented in three testbeds: multizone temperature control, balls-in-tubes, and electromechanical arcade. These testbeds are used in laboratory courses such as **ECE758** and for research.

Graduate Teaching Assistant (The Ohio State University)

- During the Au'06 I was the Teaching Assistant for ECE209 (Circuits and Electronics Laboratory) and ECE561 (Digital Circuits Design).
- During the Sp'06 I was the Teaching Assistant for ECE351 (Systems I) and ECE352 (Systems II).
- During the Wi'05, Su'05, and Su'06 I was the Teaching Assistant for ECE557 (Control Systems Technology Laboratory).
- During the Sp'02, Sp'04, and Sp'05 I was the Teaching Assistant for **ECE758** (Control System Implementation Laboratory).
- During the Wi'02 I was the Teaching Assistant for **ECE682P** (Experimental Biomimicry for Distributed Control).

Traffic Engineer (Capitel-Telecom, Bogotá-Colombia)
Aug '00 – Dec '00

- Analyzed and suggested solutions for the local telephone network in Bogotá.

Instructor (Pontificia Universidad Javeriana, Bogotá-Colombia)
Aug '99 – Dec '00

- I was the sole Instructor for classes on *Dynamic Systems* and *Circuits Theory II*.

Teaching Assistant (Pontificia Universidad Javeriana, Bogotá-Colombia)
Jan '96 – Aug '99

- I was the Teaching Assistant for several classes such as: *Dynamic Systems, Circuits Theory II, Analog Communications, Control Systems I, Calculus, and Complex Variables.*

Electrical and Instrumentation Engineer Assistant (British Petroleum Exploration Colombia, Bogotá, Cusiana, Cupiagua-Colombia) Aug '97 – Jan '98

- This work was part of an internship, and the idea was to help the electrical and instrumentation engineer to acquire some data from the oil wells, organize and study Piping and Instrumentation Diagrams (P&IDs), and to assist with the foreign engineers that came from USA and Europe.

Publications

Journal Papers

1. Jorge Finke, Nicanor Quijano, and Kevin M. Passino, "Emergence of Scale Free Networks from Ideal Free Distributions", Europhysics Letters, Vol. 82, April 2008.

2. Nicanor Quijano and Kevin M. Passino, "Honey Bee Social Foraging Algorithms for Resource Allocation: Theory and Application," Submitted for journal publication, IEEE Transactions on Systems, Man, and Cybernetics Part B, 2007.

3. Nicanor Quijano and Kevin M. Passino, "The Ideal Free Distribution: Theory and Engineering Application," IEEE Transactions on Systems, Man, and Cybernetics Part B, Vol 37, No. 1, pp154-165, February 2007.

4. Nicanor Quijano, Burton W. Andrews, and Kevin M. Passino, "Foraging Theory for Multizone Temperature Control," IEEE Computational Intelligence Magazine, Vol. 1, No. 4, pp. 18-27, November 2006.

5. Nicanor Quijano, Alvaro E. Gil, and Kevin M. Passino, "Experiments for Dynamic Resource Allocation, Scheduling, and Control," IEEE Control Systems Magazine, Vol. 25, No. 1, pp. 63-79, Feb. 2005.

Conference Proceedings

1. Eduardo Ramírez-Llanos and Nicanor Quijano, "E. Coli Bacterial Foraging Algorithm Applied to Pressure Reducing Valves Control", Submitted to the IEEE American Control Conference, 2009.

2. Pablo Ñañez and Nicanor Quijano, "Honey Bee Social Foraging for Urban Traffic Control", Submitted to the IEEE American Control Conference, 2009.

3. Catalina Caro, Eduardo Mojica-Nava, and Nicanor Quijano, "Carnot Cycle and Hybrid Systems: Modeling and Analysis", Submitted to the IEEE American Control Conference, 2009.

4. Mojica-Nava E., Meziat R., Quijano N., Gauthier A., Rakoto-Ravalontsalama N., "Stability Analysis of Switched Non-linear Systems Using Dissipation Inequalities", To appear IEEE Control Decision Conference, Cancún, Mexico, 2008.

5. Mojica-Nava E., Meziat R., Quijano N., Gauthier A., Rakoto-Ravalontsalama N., "Optimal Control of Switched Systems: A Polynomial Approach", In Proceedings of the IFAC World Congress 2008, Seoul, Korea.

6. E. Ramírez y N. Quijano, "Control Adaptivo E.Coli Aplicado a la Regulación de Presión en una Red de Distribución de Agua Potable", In Proceedings of the IV Colombian IEEE Workshop on Robotics and Automation, 2008, Cali, Colombia.

7. P. Ñañez y N. Quijano, "Forraje Social en Control de Tráfico Urbano", In Proceedings of the IV Colombian IEEE Workshop on Robotics and Automation, 2008, Cali, Colombia.

8. J.L.Ramírez, N. Quijano, C.F.Rodríguez, "Modelos Bio-inspirados para Labores de Vigilancia e Inspección", In Proceedings of the IV Colombian IEEE Workshop on Robotics and Automation, 2008, Cali, Colombia.

9. C. Caro, N. Quijano, y E.Mojica-Nava, "Sistemas Híbridos y el Ciclo de Carnot Modelo y Análisis", In Proceedings of the IV Colombian IEEE Workshop on Robotics and Automation, 2008, Cali, Colombia.

10. A. Sierra y N. Quijano, "Teoría del Forraje y sus Aplicaciones para el Control de Temperatura Multizona", In Proceedings of the IV Colombian IEEE Workshop on Robotics and Automation, 2008, Cali, Colombia.

11. Andrés D. Pantoja and Nicanor Quijano, "Modeling and Analysis for a Temperature System Based on Resource Dynamics and the Ideal Free Distribution," in Proceedings of the American Control Conference, 2008. , 2008. p.3390 - 3395.

12. Jorge Finke, Nicanor Quijano and Kevin M. Passino, "Ideal Free Distribution Growing on Networks," in Proceedings of the American Control Conference, 2008. IEEE, 2008. p.159 – 164.

13. Nicanor Quijano, Modelado y Análisis de un Sistema Feedforward Basado en la Distribución Ideal Libre," Proceedings of the Colombian Workshop on Robotics, Automation, and Control, Cartagena, Colombia, 2007.

14. Nicanor Quijano and Kevin M. Passino, "Honey Bee Social Foraging Algorithms for Resource Allocation, Part I: Algorithm and Theory," Proceedings of the 2007 American Control Conference, pp. 3383-3388, July 11-13 New York City, NY, 2007.

15. Nicanor Quijano and Kevin M. Passino, "Honey Bee Social Foraging Algorithms for Resource Allocation, Part II: Application," Proceedings of the 2007 American Control Conference, pp. 3389-3394, July 11-13 New York City, NY, 2007.

16. Nicanor Quijano and Kevin M. Passino, "Optimality and Stability of the Ideal Free Distribution with Application to Temperature Control," Proceedings of the 2006 American Control Conference, pp. 4837-4842, June 14-16 Minneapolis, Minnesota, 2006.

17. Nicanor Quijano and Kevin M. Passino, "Resource Allocation Strategies for Multizone Temperature Control," Proc. of 2nd IFAC Symposium on System, Structure and Control, Oaxaca, México, December 2004.

Books

Theodore Pavlic, Burton W. Andrews, Nicanor Quijano, Jorge Finke, Brandon J. Moore, Kevin M. Passino, Thomas A. Waite, "Foraging Theory for Engineering"

Skills

Engineering tools: MATLAB/Simulink, LabVIEW, dSPACE, LaTeX.
Programming Languages C, PASCAL, Code Composer
Hardware: dSPACE 1104 controller board, DAQ LabVIEW, Microcontrollers PIC, Dallas DS5000, Atmel 8052, and Intel 8051.
OS: Win Xp.
Languages: Fluent in Spanish, English, and French, written and oral.

Presentations and Short Courses

1. Plenary talk Universidad de Nariño, Pasto, May 2008.
2. Plenary talk at the ***II Jornada IEEE Ingeniería Electrónica, Control, y Auomatización,*** Universidad Tecnológica de Bolívar, Cartagena, April 2008.
3. Plenary talk at the ***I ISA Show Andino,*** Corferias, Bogotá, October 2008.
4. Carlos Cotrino, **Nicanor Quijano,** and Luis David Prieto, ***Coloquio Sobre Control Pontificia Universidad Javeriana,*** **One day technical talk** Bogotá, Sept. 2005 about Game Theory and Stability.
5. Kevin M. Passino**, Nicanor Quijano,** and Jorge Finke, ***Bio-Strategies for Optimization, Control, and Navigation; Stable Multiagent Systems and Distributed Control***, **Two two-day short courses**, both done in Cali and Medellín, Colombia, July 24-Aug. 1, 2004. In Cali we had around 30 students, and in Medellín we had around 60 students. I was responsible for 30% of the lectures in the course, where we gave some examples in the

areas of Foraging Theory and Stability Analysis. I gave a talk on the Ideal Free Distributions for Distributed Control, and also I gave an overview of the International Educational Laboratory Development for Feedback Control Engineering and Automation program. This program has a strong emphasis on very low-cost designs that do not sacrifice educational goals for both undergraduate and graduate programs.

6. **Nicanor Quijano**, Pontificia Universidad Javeriana, and Universidad Autónoma de Bogotá, Aug. 2004. **One day technical talk** about Ideal Free Distributions for Distributed Control, and an overview of the International Educational Laboratory Development for Feedback Control Engineering and Automation program. At the Pontificia Universidad Javeriana I had around 80 students, and at the Universidad Autónoma I had around 30 students.
7. Samuel Duque, **Nicanor Quijano**, Oscar Useche, "Simulador digital para control y evaluación de procesos industriales" during Expoproyectos, Bogotá, Colombia, September 29 1999.

Relevant Courses

College Teaching in Engineering, Intelligent Control, Linear Systems Theory, Nonlinear Systems, Nonlinear Control Systems, Estimation Theory, Adaptive Control, Digital Signal Processing, Design of Feedback Control Systems, Optimal Control, Hierarchical and Distributed Control Lab, Probability Theory, Random Variables Theory, Microprocessor Interfacing Techniques, Communication Networks, Real Analysis, Evolutionary Ecology, Stochastic Control.