

CURRÍCULUM VITAE

RICARDO ZAVALA YOÉ

rzyoe00@gmail.com , rzavalay@itesm.mx	Date of Birth: 21/5/68 Place of Birth: Mexico City, Mexico
---	---

Education

PhD. Math: Modeling & Control of Dynamical Systems **2002-2006**

Johann Bernoulli Instituut voor Wiskunde en Informatica (Institute for Math and Computer Science).

Rijksuniversiteit Groningen (University of Groningen, The Netherlands)

Dissertation: "Algorithms and Numerical Issues in the Behavioral Approach for Systems and Control"

DISC (Dutch Institute of Systems and Control) **2002-2004**

Certificate obtained

Postgraduate Studies (M.Sc.Eng.) **1993-1995**

Universidad Nacional Autónoma de México, Control Engineering

GPA: 4 /4 (Magna Cum Laude), Research Focus: Modelling, Robotics and Automation

Thesis: "Fuzzy Control of Second Order Vector Systems (Euler-Lagrange Systems)"

Bachelor's Degree (BSME/BSEE) **1987-1991**

Universidad Nacional Autónoma de México, (National University of Mexico, UNAM)

GPA 3.6/4 (Magna Cum Laude)

Thesis: "Fuzzy Control Study and its Implementation on a microcontroller unit (M68HC11): Position control of a rotating mechanism".

Fellowships and Grants Awarded

Abbott Laboratories, Mexico City, (Bachelor studies).

National University of Mexico, (Bachelor and Master studies)

CONACyT (National Council for Science & Technology), Mexico, (Master and PhD studies)

University of Groningen, The Netherlands, (PhD studies)

Instituto Tecnológico de Monterrey (ITESM), Mexico City, (PhD studies).

Principal Research and Teaching Interests

Research:

- **Modelling and control of dynamical systems.**
- **Mechanical systems: Serial and parallel robots. (Analytical and numerical models, control, computational simulation).**
- **Bioengineering topics (I): Modelling and identification of EEG (electroencephalograms) in generalized cryptogenic/idiopathic epilepsy as dynamical systems.**
- **Bioengineering topics (II): Orthosis design via gait analysis and fluid dynamics.**
- **Numerical linear algebra applied to control systems.**

Teaching Interests:

- **Undergraduate and graduate levels:**
- **Math (all) and Mech.Elec. Eng: (Control systems, Robotics, Modelling of Dynamical Systems, Numerical Methods, Scientific Programming (MATLAB, MAPLE),etc.**
- **Social sciences: Math (Differential and Difference equations, Dynamical systems, Statistics, Probability); Scientific Programming (MATLAB, MAPLE).**

Work Experience

Researcher: Instituto Tecnológico de Monterrey, 2014.

Teaching/research: Numerical Analysis, Control Engineering, Nonlinear Systems, Control of robots, Predictive Control, Multivariable Linear Systems, Modelling of Dynamical Systems, Intelligent Control, (ITESM, ITAM¹ graduate students), Mexico City, 2006-2013.

Research Assistant: Rijksuniversiteit Groningen, The Netherlands, 2002-2006.

Teaching:

Math for Finance, Statistics, Control Engineering, ITESM, Mexico City, Mexico, **1995- 2002**

Robotics, Control Engineering, Postgraduate Level (master deg.), UNAM, Mexico City, Mexico, **1997**

Robotics, Control Engineering, La Salle University, Mexico City, Mexico, **1995-1998**

Robotics, Control Engineering, Anáhuac University, Mexico City, Mexico, **1995 – 1998**

Project Leader:

Designing and implementing courses in Automation and Process Control for enterprises(2001)

Designing and implementing courses in Quantitative Methods for enterprises (2002)

Part time consultor, **Mathworks** Mexico (Computing & Financial Math. Appl. for Banks) **2001-2002**

Developer of the **Matlab** based freeware toolbox “Behavioral Toolbox” (during PhD studies at RuG).

¹ Instituto Tecnológico Autónomo de México.

Bachelor, Master and PhD degree's thesis advisor

Undergraduate:

“Demand of energy in cement industry in Mexico and saving energy options: Identification and fuzzy control of a rotary cement kiln”, (Bach.Eng). Leticia Ozawa Meida, Fac.Ing., UNAM, 1997 (Magna Cum Laude). Joined supervision with Dr. Claudia Sheinbaum Pardo.

Graduate:

“Modelling, design and control of a PUS parallel robot”. Javier Ruiz (Master Eng. Degree. Magna cum laude). ITESM ,CCM , December, 2008.

“Design and Control by Gait Analysis of a Magnetorheological Orthosis”, Carlos Galván Duque. ITESM-CCM (Master degree. In progress).

“Optimal design and control of a parallel robot 3SPS-1S”, Daniel Chaparro Altamirano, ITESM-CCM (Master degree, Magna Cum Laude,finished).

“Study, simulation, control and implementation of a tire radius buffer inverse kinematics”, Alejandro Nila, ITESM-CCM (Master degree, finished).

“Classification of Jurisprudence by means of the Naïve-Bayes Algorithm”, Sergio Lemus, ITESM-CCM. (Master degree, finished).

“Usage of the Bag of words" method on URL, Roman Hujer, University of Czech Republic (co-supervised during one semester in Mexico City, PhD finished).

“Analysis, modeling, design and control of a quadricopter”, Eduardo Bucio, , ITESM-CCM (Master degree, in progress).

“Intelligent damping for an a automobile”, Miguel Sandoval, , ITESM-CCM (Master degree, in progress).

“Controlling electrical current pikes in home installations”, Erick Moreno, , ITESM-CCM (Master degree, in progress).

Technology

Computer Languages:

JAVA SCRIPT, HTML., DIRECTOR, FLASH,DREAM WEAVER,POSER4,FIREWORKS
JAVA, FORTRAN 77, PASCAL, BASIC.

Mathematics, Engineering and Financial Software:

SIMNON, MATLAB, DERIVE, MAPLE, SCILAB, REUTERS,EXCEL-VBA,COMSOL,
Basic ECONOMÁTICA, SPSS.(Statistics Package for Social Sciences).

Electronics Engineering and Automation Interfaces.

Motorola microcontroller M68HC11, PLC FESTO (FP202C y FP405), PLC Siemens (S7200), Siemens Logic Module (LOGO!), PLC Telemecanique, Pneumatic for automation..

Selected Publications

Ricardo Zavala Yoé, **Fuzzy Control of Second Order Vector Systems: L2 Stability**. European Control Conference, 1997, Brussels, Belgium.

Ricardo Zavala Yoé, C.Praagman, H.L. Trentelman, The Stable Embedding Problem. International Federation of Automatic Control (IFAC), Prague, Czech Republic, 2005.

Ricardo Zavala Yoé, H.L. Trentelman, C.Praagman, Embedding Polynomial Matrices: A Practical Perspective. 44th IEEE Conference On Decision and Control (CDC) - European Control Conference (ECC), 2005.

Ricardo Zavala Yoé, Embedding Polynomial Matrices, 24th Benelux Meeting on Systems and Control, OI Fousse D'Outh, Houffalize, Belgium, March 22-24, 2005

C.Praagman, H.L. Trentelman, Ricardo Zavala Yoe', On the Parametrization of all Regularly Implementing Controllers, International Federation of Automatic Control (IFAC), Prague, Czech Republic, 2005.

Ricardo Zavala Yoe', **Inherently Numerical and Physical Issues of Polynomial Modeling and Control** 1st IFAC Workshop on Applications of Large Scale Industrial Systems, Helsinki - / Stockholm (ALS!) 2006.(Accepted).

H.L. Trentelman, Ricardo Zavala Yoe', C.Praagman, Polynomial Embedding Algorithms for Stabilization and Pole Placement ,MTNS 2006, Kyoto, Japón.

H.L. Trentelman, Ricardo Zavala Yoe', C.Praagman, Polynomial Embedding Algorithms for Controllers in a Behavioral Framework, (2007 **IEEE Trans. On Automatic Control**, Vol.52, No.11,pp.1-6,2007)

C. Praagman, H.L. Trentelman, Ricardo Zavala Yoe', On the Parametrization of all Regularly Implementing and Stabilizing Controllers, (**SIAM Journal on Control and Optimization**, Vol.45, Nr.6,pp.2035-2053,2007).

Ricardo Zavala Yoe', C.Praagman, H.L. Trentelman, An Embedding Algorithm for Polynomial Matrices Tested Numerically, {17th International Symposium on Mathematical Theory of Networks and Systems, MTNS, Kyoto, Japón, 2006).

C.Praagman, Ricardo Zavala Yoe', Column compression and embedding of polynomial matrices. (Submitted to **Systems and Control Letters**, October, 2008).

Javier Ruiz García, Ricardo Zavala Yoé, Ricardo Ramírez, **'Numerical-Geometric Method to determine the Direct Kinematics of a 6-PUS Parallel Robot'**, IEEE 2013 International Conference on Mechatronics, Electronics and Automotive Engineering (ICMEAE); 11/2013

Javier Ruiz García, Ricardo Zavala Yoé, Daniel Chaparro, Ricardo Ramírez, **'Direct and Inverse Dynamic Modelling of a 6-PUS parallel robot'**, IEEE 2013 International Conference on Mechatronics, Electronics and Automotive Engineering (ICMEAE); 11/2013

Carlos Galván-Duque, Ricardo Zavala Yoé, **'ANFIS, ARX and OE Identification for Classification of Gait Events'**, (**1st International Conference on Applied Bionics and Biomechanics IEEE-ICABB-2010**).

Carlos Galván-Duque, Ricardo Zavala Yoé, Ricardo Ramírez, **'Comparission between Classical and Intelligent ARX Models for Classification of Gait Events'**, (IEEE 2013 International Conference on Mechatronics, Electronics and Automotive Engineering (ICMEAE); Nov. 2013

Daniel Chaparro, Ricardo Zavala Yoé, Ricardo Ramírez, **'Kinematic and Workspace Analysis of a Parallel Robot used in Security Applications'**, (IEEE 2013 International Conference on Mechatronics, Electronics and Automotive Engineering (ICMEAE), 11/2013).

Ricardo Zavala Yoé **'Modelling and Control of Dynamical and Physiological Systems: Some new challenges to deal with'**, Workshop in Modeling and Simulation, BIRS (Banff International Research Station for Mathematical Innovation and Discovery), Calgary/Banff, Canada, 2011.

Daniel Chaparro, Ricardo Zavala-Yoé, Ricardo Ramírez-Mendoza, **'Dynamics and Control of a 3SPS-1S Parallel Robot Used in Security Applications'**, 21st International Symposium on Mathematical Theory of Networks and Systems, MTNS 2014, Groningen, The Netherlands.

Ricardo Zavala-Yoé, Daniel Chaparro, Ricardo Ramírez Mendoza, **'Artificial Intelligence-based design of a Parallel Robot used as a Laser Tracker System: Intelligent vs. Nonlinear Classical Controllers'**, Lecture Notes in Computing Science', 2014.

Ricardo Zavala-Yoé, Ricardo Ramírez-Mendoza, Daniel Chaparro, **'Kinematic and Dynamical Modelling for Control of a Parallel Robot-based Surveillance/Sentry Device'**, (submitted to Journal Advances in M. Tech., 2014).

Ricardo Zavala-Yoé, Ricardo Ramírez-Mendoza, Javier Ruiz, **'Mechanical and Computational Design for Control of a 6-PUS Parallel Robot-based Laser Cutting Machine'** (submitted to Journal Advances in M. Tech., 2014).

Ricardo Zavala-Yoé, Ricardo Ramírez-Mendoza, Luis C. Jiménez, **'Analysis and Processing of Electroencephalographic Signals'**, 1st International Congress on Innovation in Education', Instituto Tecnológico de Monterrey, campus Ciudad de México (17th-20th December, 2014, accepted).

Ricardo Zavala-Yoé, Ricardo Ramírez-Mendoza, Luz M. Cordero, **'Evaluating Complexity Measures for the Analysis of Multiple-Long Term Electroencephalographic Signals in Children Epilepsy: Bivariate Multiscale Entropy'** (submitted to 14th European Control Conference, 2015).

Ricardo Zavala-Yoé, Ricardo Ramírez Mendoza, Luz Ma. Cordero, **'Novel way to Investigate Evolution of Refractory Epilepsy by Complexity Metrics in Massive Information'**, (submitted to Springer Plus Journal, 2014).

Ricardo Zavala-Yoé, Ricardo Ramírez Mendoza, Daniel Chaparro, **'Numerical/Analytical Modelling of a Parallel Robot Laser Tracker System in Classical/Intelligent Control'**, (submitted to Journal of Control Science and Engineering, 2015).

R e c e n t t a l k s :

- a) University of Calgary-Banff International Research Station
Workshop in Modeling and Simulation, Calgary/Banff, Canada, 2011

“Modelling and Control of Dynamical and Physiological Systems: Some new challenges to deal with”
- b) Vrije Universiteit van Amsterdam (University of Amsterdam)
Medical Center (VUmc)
Klinische Neurofysiologie
The Netherlands

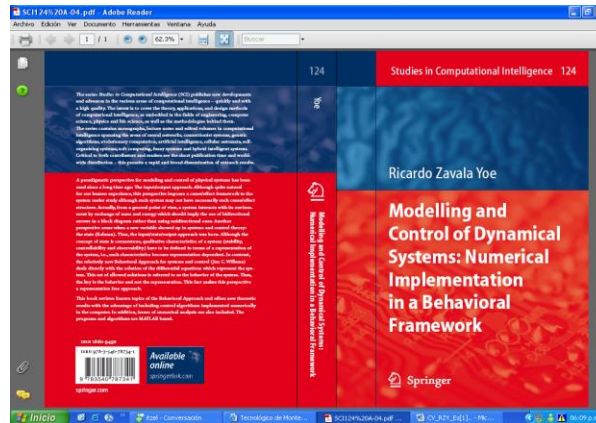
“Complexity Measures Analysis in an Instance of Intractable Epilepsy”
30th June 2014
- c) Rijksuniversiteit Groningen (University of Groningen)
Universitaire Medisch Centrum Groningen
Klinische Neurology
The Netherlands

“Complexity Measures Analysis in an Instance of Epilepsy: Evolution of a Doose Syndrome”
8th July 2014
- d) Hospital General de México
Pediatric Neurology Department

“Complejidad Matemática para el apoyo del análisis de múltiples EEG de largo plazo en epilepsias infantiles refractarias”
(Mathematical Complexity for Support of Analysis Of Multiple-Long Term EEG in Children Refractory Epilepsies).
18th November 2014

B o o k s (P r o g r a m s i n c l u d e d i n M A T L A B) :

- a) Ricardo Zavala Yoé, “Modelling and Control of Dynamical Systems:Numerical Implementation in a Behavioral Framework”.(Springer-Studies in Computational Intelligence series). ISBN: 978-3-540-78734-1,2008



- b) **Ricardo Ramírez** (Dean of *Tecnológico de Monterrey, Mexico City Campus*), **Ricardo Zavala Yoé**, “Modelling and Simulation of Dynamical Systems”, (eBook finished).

References :

Dr. Piotr M. Wisniewski, ITESM. Puente 222, Mexico City. 14390. Tel. +52 555 54831455

Dr. Ricardo Fernández. ITESM. Puente 222, Mexico City. 14390.

ricardo.fernandez@itesm.mx, Tel +52 555 54832020.

Dr. Marco Arteaga, UNAM, arteaga@verona.fi-p.unam.mx, Tel. +52 555 56223014.

Dr. Hub Hermans, University of Groningen.

Oude Kijk in het Jatstraat 26. 9712 EK.

Groningen. (The Netherlands). Tel. +31 50 3635879, Email: hermans@let.rug.nl

Dr. Kees Nagtegaal, Universitair Onderwijs Centrum, University of Groningen.

Email: nagtegaal34@zonnet.nl.

Languages :

Spanish (native speaker), English (fluent), Dutch (intermediate), German (intermediate).

Visiting Positions:

1997: Universidad de Alcalá de Henares, Madrid, Spain₁

“Fuzzy control of a mobile robot”

Some Courses followed in Professional Development

(1995-2002)

Pedagogy.

Automation Siemens - Mexico, Mexico City, Mexico

Scientific Grants and Funding

- *Instituto Tecnológico de Monterrey, NOVUS, 2014 (20,000 USD assigned).*
- *Consejo Nacional de Ciencia y Tecnología, CONACyT (National Council for Research and Technology), Fondos de Investigación para Ciencia Básica (submitted for 160,000 USD).*