

PERSONAL
INFORMATION

Birthday: 8/Jul/1984
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CURRENT JOB

Innovation and development of intelligent conversational agents for commercial purposes at the Coordination of Information and Communication Technology Services. (CGSTIC: Coordinación y Gestión de Servicios de Tecnologías de Información y Comunicaciones) located in the Research Center and Advanced Studies of the Polytechnic National Institute (CINVESTAV-IPN: Centro de Investigación y estudios Avanzados del Instituto Politécnico Nacional). Mexico City, Mexico. Since November 2016.

INTERESTS &
SKILLS

Programming and Data Base Managing Languages

MATLAB, MATHEMATICA, Python, R, Java, C/C++, PHP-HTML-MySQL(SQL), CassandraDB(NoSQL, Cassandra Query Language).

Research

Time series modelling and forecasting of non-linear or chaotic time series applied to drinking water demand and speed wind forecasting using Machine Learning (SVM, Artificial Neural Networks, Fuzzy Logic, Nearest Neighbors). Interest in efficient algorithms for nearest neighbors search. Probabilistic Multi-Model forecasting (Bayesian Approach). Stability analysis and parameter identification of non-linear dynamical systems represented by Ordinary Differential Equations using evolutionary computing.

Research groups and projects

Project of the Mexican Center of Energy Innovation in Electrical Power Systems: Forecasting the required natural resources for the production of renewable electric power. <https://www.ineel.mx/>.
Network of Applied Computational Intelligence. <https://goo.gl/7B4RcE>.

Languages

English: 550 ITP TOEFL points.
Italian: B1 Common CEFRL Level.

ACADEMIC
DEGREE

Ph.D. in Computer Science and Engineering. (With European Doctorate mention).
Institute: IMT School of Advanced Studies Lucca. Lucca, Italy. (*Feb/2012 - Jan/2016*).
Thesis: Time Series Forecasting Based on Classification of Dynamic Patterns.

Advisors: Ph.D. Alberto Bemporad. Ph.D. Pantelis Sopasakis.

Field of study: Time series analysis and modelling with machine learning.

Taken Courses: Semantics and formal methods. Algorithmic complexity. Basic linear algebra. Principles of parallel and concurrent computing. Performance modelling applied to Computer Networks. Specification, modelling and verification of reactive systems. Introduction to global and local optimization. Model checking. Optimum control, (Optimization Algorithms). Programming Methodologies with Python. Cloud Computing. Theory of complex networks. Machine Learning.

M.Sc. in Electrical Engineering (Computer Systems Group).

University: Michoacan University of San Nicolas de Hidalgo. (Universidad Michoacana de San Nicolas de Hidalgo). Morelia, Mexico. (*Mar/2008 - Aug/2010*).

Thesis: Bifurcation Diagrams for Discontinuous or Non-differentiable Equations.

Advisors: Ph.D. Juan Jose Flores Romero, Ph.D. Claudio Fuerte E.

Field of study: Evolutionary computing, unconstrained global optimization, nonlinear dynamical systems, stability analysis.

B.Eng. in Computer Systems.

Institute: Morelia Institute of Technology (Instituto Tecnológico de Morelia). Morelia, Mexico. (*2002-2007*).

Thesis: Implementation and performance analysis of “**Linux Terminal Server Project**” for educational purposes.

Field of Study: Applications of distributed operative systems.

ACADEMIC
EXPERIENCE

Teaching.

Morelia Institute of Technology. Morelia, Mexico.

- Structured programming and object oriented programming (in Electronic and Industrial Engineering), Research Methodology (in Computational Systems Engineering). (*Aug/2011 - Jan/2012*).
- Database Fundamentals (Computational Systems Engineering), Structures and data organization. (Technology Information Engineering) and Evaluation of software projects. (*Jan/2011 - Jul/2011*).
- Operative systems, selected topics in programming and research fundamentals. (*Aug/2010 - Dec/2010*).

University of Morelia (Universidad de Morelia). Morelia, Mexico.

- Web programming with PHP. (*Aug/2009 - Dec/2009*).

PROFESSIONAL
EXPERIENCE

Michoacan University of San Nicolas de Hidalgo. (Oct/2015 - Oct/2016)

Department: Computer Center and University Information processes.

Activity: Web manager, programmer and collaborator for decision making for an efficient administration of university information.

State Center for Information and Communications Technologies (CETIC). (*Mar/2007 - Jun/2007*). Morelia, Mexico.

Department:Infrastructure department.

Activity: Professional training in the project Performance analysis of **Linux Terminal Server Project** applied to basic education.

Morelia Institute of Technology. Morelia, Mexico. (*Feb/2007*)

Activity: Social Service Project: Web catalog with PHP for Social Service.

PUBLICATIONS

Articles in Journals included in Journal Citation Reports

Accepted

- **Short-Term Demand Forecast using Bank of Neural Network Models Trained using Genetic Algorithms for the Optimal Management of Drinking Water Networks.** *Hector Rodriguez Rangel, Vicenç Puig, Rodrigo López Farías, Juan*

J. Flores . Journal of Hydroinformatics. DOI: 10.2166/hydro.2016.199. ISSN: 1464-7141
November 2016.

Under Review

- **Evolving Nearest Neighbor Time Series Forecasters.** *Juan J. Flores, José Cedeño Gonzalez, Rodrigo López Farías, Félix Calderón .* (submitted to: *Journal of Soft Computing*, <https://goo.gl/hSV5SV>, August 2016).

Next Submissions

- *Rodrigo Lopez Farías, Vicenç Puig, Hector Rodriguez Rangel, Juan J. Flores Romero.* Probabilistic Selection of Qualitative Prediction Models of Water Demand Time-Series (Journal of Hydroinformatics, <http://jh.iwaponline.com/>).

Peer Reviewed Accepted Articles in National and International Conferences Accepted

- **Comparison of Time Series Forecasting Techniques with respect to Tolerance to Noise.** *Juan J. Flores, Felix Calderon Solorio, Jose Rafael Cedeño Gonzalez, Jose Ortiz Bejar and Rodrigo Lopez Farias.* (Pendiente) .*IEEE Autumn Meeting on Power, Electronics and Computing, Ixtapa , November 2016.*
- **Holt-Winters Residual Modelling using an ANN trained by GA and Time Series Validation Applied to Water Demand Forecasting** *Hector Rodriguez-Rangel, Vicenç Puig, Juan J. Flores and , Rodrigo López Farías..* (Pending). **3rd International Conference on Control and Fault-Tolerant Systems Barcelona, Spain. Septiembre 2016.**
- **Flow meter Data Validation and Reconstruction using Neural Networks: Application to the Barcelona Water Network** *Hector Rodriguez Rangel, Vicenç Puig, Juan J. Flores and , Rodrigo López Farías..* <https://goo.gl/i7muz7>. **2016 European Control Conference, Aalborg. June 2016.**
- **Qualitative and Quantitative Mul** *Rodrigo López Farías, Juan J. Flores and Vicenç Puig.* ti-Model Forecasting with Nonlinear Noise Filter Applied to Water Demand *IEEE Autumn Meeting on Power, Electronics and Computing.* DOI: 10.1109/ROPEC.2015.7395122. **Ixtapa Mexico, November 2015.**
- **FNN a Fuzzy Version of the Nearest Neighbour Time Series Forecasting Technique** *Juan J. Flores, Jose Ortiz Bejar, Jose Rafael Cedeño, Carlos Lara-Alvarez and Rodrigo López Farías.* *IEEE Autumn Meeting on Power, Electronics and Computing.* DOI: 10.1109/ROPEC.2015.7395125. **Ixtapa Mexico, November 2015 .**
- **A Multiple-Model Predictor Approach Based on an On-Line Mode Recognition with Application to Water Demand Forecasting** *Rodrigo López Farías, Vicenç Puig.* *International work-conference on Time Series 1.* URI <https://goo.gl/njWQ1e>. **Granada Spain, July 2015.**
- **An implementation of a multi-model predictor based on the qualitative and quantitative decomposition of the time-series.** *Rodrigo. López, Vicenç Puig, Hector Rodriguez.* URI <http://hdl.handle.net/2117/81862>. *International work-conference on Time Series 1* **Granada Spain, July 2015.**
- **Optimization with gravitational Interactions** *Dr, Juan Flores, Rodrigo López, Julio Barrera.* *ROPEC XIII: Autumn Meeting of Electric power systems, electronic and computation (Reunión de Otoño de Potencia, Electronica y Computacion)* **Morelia Mexico, November 2011.**
- **Gravitational Interactions Optimization.** *Juan Flores, Rodrigo Lopez, Julio Barrera.* *Learning and Intelligent OptimizatioN (LION 5)* DOI 10.1007/978-3-642-25566-3_17. **Rome, Italy - January 2011.**
- **Particle swarm optimization with gravitational interactions for multimodal and unimodal problems.** *Juan J. Flores, Rodrigo Lopez and Julio Barrera.* In *Proceedings of the 9th Mexican International Conference on Artificial Intelligence (MICA I 2010)*, pages 3361-370. Springer-Verlag. DOI 10.1007/978-3-642-16773-7_31. **Pachuca, Mexico. November 2010.**

Peer Reviewed Articles in Scientific and Technologic Divulagation Mexican Journals

Under Review

- **Failure tolerant flow Measurement system for drinking water networks using artificial intelligence (Sistema de Medición de Flujos de Agua Tolerante a Fallos en Redes de Distribución de Agua Potable Utilizando Inteligencia Artificial)** *Hector Rodríguez Rangel, Rodrigo López Farías, Giovanni Manjarrez Montelongo, Luis A. Morales Rosales y Gloria Ekaterine Peralta Peñúñuri.* (Submitted to *Komputer Sapiens*, <http://smia.mx/komputersapiens/>, May/2017).

CONFERENCES, SEMINARS & WORKSHOPS

Given

- 4th National Seminar of machine learning and computational intelligence organized by the National Institute of Optics, Astrophysics and electronic. (SNAIC: Seminario Nacional de Aprendizaje e Inteligencia Computacional del Instituto Nacional de Astrofísica, Óptica y Electrónica, INAOE). Water demand prediction with Genetic Algorithms for the optimum operation of the drinking water distribution system: the Barcelona Case. Michoacan University of San Nicolas de Hidalgo (Universidad Michoacana de San Nicolás de Hidalgo). (Morelia, Mexico. Sept/2016).
- 11th State Science, Technology and Innovation congress in Engineering and computer Science. PSO with Interactive Niches and Quasi-Newton Local Searches. Search the most connected Clique in a Weighted Graph with Ant Colony Optimization. Morelia, México. Oct/2016.
- 10th State Congress of Science Technology and Innovation in Engineering and computer Science. PSO with Interactive Niches and Quasi-Newton Local Searches. Morelia, Mexico. Sep/2015.
- Activities of the 10th Anniversary of the Instituto Tecnológico Superior de Ciudad Hidalgo - ' Evolutionary computing applied to dynamical systems'.(Ciudad Hidalgo, Mexico. October 2010).
- Week of Research Projects FIE of the UMSNH - 'Gravitational Interactions Optimization ' (Morelia, Mexico. Jun/2010)
- Week of Research Projects FIE of the Michoacan University of San Nicolás de Hidalgo - - 'Bifurcation Diagrams using Artificial Intelligence Algorithms (Diagramas de Bifurcación Utilizando Herramientas de Inteligencia Artificial)' Morelia, Mexico. Jun/2009.

Attended

- 5th HYCON2 Ph.D. School on Control of Networked and Large-Scale Systems and the EFFINET Ph.D. School on Control of Drinking Water Networks (Lucca Italy, (1-5)/Jul/2013)
- Java workshop in the 2nd Week of Computation and Systems. Morelia, Mexico (2006).
- Analysis and Object Oriented Design using UML (Morelia Mexico, (8-12)/Aug/2011)