Updated:

Rodrigo López Farías, Ph.D. *Computer Science and Engineering* *18/07/2020*

PERSONAL INFORMATION

Birthday: 8-Jul-1984
Residence: Corregidora, Queretaro

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CURRENT JOB

Researcher of National Council on Science and Technology (CONACyT) commissioned and working at the Center for Research of Geo-spatial Information Sciences (CentroGeo). (Since Nov 2017).

INTERESTS & SKILLS

Programming and Data Base Managing Languages Python, R, Matlab, Mathematica, Java, C/C++, PHP-HTML-MySQL(SQL), CassandraDB (NoSQL, Cassandra Query Language).

Research

Time and spatio-temporal (geographic information) series modelling and prediction with machine learning (Artificial Neural Networks, Nearest Neighbors, Support Vector Machines). Multi-Model Prediction with probabilistic model selection. Heuristics for global and non-convex optimization applied to System Identification in Biology Systems.

Research groups and projects Network of Applied Computational Intelligence. https://goo.gl/7B4RcE. 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/.

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.

Queretaro Institute of Technology. Queretaro, Mexico.
- Internet of things (Computer Systems Engineering). *(Jan/2020 - May/2020).*

Morelia Institute of Technology. Morelia, Mexico.
- Programming (Electrical Engineering), Programming and Algorithms (Mechanical Engineering), Algorithms and Programming Languages (Industrial Engineering), Operative Systems II (Engineering Informatics)), Programming II (Electronic Engineering). *(Aug/2011 - Jan/2012).*
- Data structure and Organization (Information and Communication Technologies Engineering),Database fundamentals (Computer Systems Engineering) and Evaluation of software projects (Engineering Informatics). *(Jan/2011 - Jul/2011).*
- Operative systems, selected topics of programming and research fundamentals(Computer Systems Engineering). *(Aug/2010 - Dec/2010).*

University of Morelia (Universidad de Morelia). Morelia, Mexico.
- Web programming with PHP. *(Aug/2009 - Dec/2009).*

Professional Experience

Center for Research and Advanced Studies of the National Polytechnic Institute (CINVESTAV)
Department: Coordination and administration of Information and Communication Technologies Services (CGSTIC) **Application of machine learning algorithms for commercial conversational agents** Mexico City. (Oct/2016 - July/2017).

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 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

- **Spatio-temporal Networks of light pollution** *Pichardo Corpus, Juan. A. and Solano-Lamphar, Hector and Lopez-Farias, Rodrigo, Delgadillo-Ruiz, Olivia.* Journal of Quantitative Spectroscopy and Radiative Transfer. (doi: pending) **June 2020**.
- **Soft Computing Methods with Phase Space Reconstruction for Wind Speed Forecasting—A Performance Comparison** *Flores, Juan. J. and Cedeño González, José R. and Rodríguez, Héctor and Graff, Mario and Lopez-Farias, Rodrigo and Calderon, Felix.* Energies. (doi: 0.3390/en12183545) **16 Sep 2019**.
- **Increasing weekend effect in ground-level O3 in metropolitan areas of Mexico** *Iván Y. Hernández-Paniagua, Rodrigo Lopez-Farias, Jose J. Piña, Luis G. Ruíz-Suárez, Juan A. Pichardo-Corpus, Olivia Delgadillo, Agustín García-Reynoso, Arnoldo Flores-Torres, Alberto Mendoza.* Sustainability. (doi: 10.1109/ROPEC.2017.8261647) **Ago 2018**.
- **Multi-Model Prediction for Demand Forecast in Water Distribution Networks** *Rodrigo López Farías, Vicenc Puig, Héctor Rodriguez Rangel, Juan J. Flores* Energies. doi:10.3390/en11030660. **Mar 2018**
- **Evolving Nearest Neighbor Time Series Forecasters.** *Juan J. Flores, José Cedeño Gonzalez, Rodrigo López Farías, Félix Calderón* . Journal of Soft Computing, DOI : 10.1007/s00500-017-2822-1. **20 Sep 2017**
- **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 **Nov 2016**.

Peer Reviewed Accepted Articles in National and International Conferences
Accepted

- **Automatic Modelling of Land Use Suitability Using Deep Feedforward Networks with Leon and Silao, Guanajuato Region Data** *Rodrigo López-Farías, Juan A. Pichardo-Corpus, Raúl A. Aguilar-Vilchis.* (ISSN: 2515-1762). International Conference on Geospatial Information Sciences 2019, **Merida, México, October 2019**. http://bit.ly/2KHxelY
- **Adaptive Nearest Neighbors Phase Space Reconstruction for Short-Time Prediction in Chaotic Time Series** *Rodrigo López-Farías, José R. Cedeño Gonzalez, Olivia Delgadillo Ruiz, Juan J. Flores.* (ISBN-13: 9781941763957) .The 10th International Multi-Conference on Complexity, Informatics and Cybernetics, **Orlando, USA, March 2019**.
- **Parameter Identification and Qualitative Analysis with Differential Evolution of the Calcium Standard Kinetics Model** *Norma C. Perez-Rosas, Rodrigo López-Farías, Agustín Guerrero-Hernández and Juan J. Flores.* (DOI: 10.1109/ROPEC.2017.8261647) .IEEE Autumn Meeting on Power, Electronics and Computing, **Ixtapa México, November 2017**.
- **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 Mexico, 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. September 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 Eu-**

ropean 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 July Barrera. In *Proceedings of the 9th Mexican International Conference on Artificial Intelligence (MICAI 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 Divulgation 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.* (Submited to *Komputer Sapiens,* `http://smia.mx/komputersapiens/`, May/2017).

Conferences, Seminars & Workshops

Given

- 4^{th} 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).
- 11^{th} 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.
- 10^{th} State Congress of Science Technology and Innovation in Engineering and compu-

ter Science. PSO with Interactive Niches and Quasi-Newton Local Searches. Morelia, Mexico. Sep/2015.

- Activities of the 10^{th} 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 Artificia)' 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)