Mauricio Carrillo Valencia

PERSONAL INFORMATION

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INSTITUTIONAL INFORMATION

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EDUCATION

Universidad Michoacana de San Nicolás de Hidalgo.
Instituto de Física y Matemáticas.
Morelia, Michoacán, México

- Ph.D. student in Physics — Sep 2013 – (Expected Date) Aug 2017

  Thesis: Artificial Neural Networks Applied to Inverse Problems in Physics.
  Adviser: Dr. José Antonio González Cervera
  Summary: Machine Learning programming. Artificial neural networks applied to parameter estimation in simulated gravitational waves of binary black hole collision. Characterization and classification of fluid patterns in simulated fluid dynamics.

- M.Sc. in Physics — Mar 2011 – Jun 2013

  Thesis: Action Potencial Backpropagation: A Simulation Study of the Participation of Ionic Channel Kv4.2
  Adviser: Dr. José Antonio De Santiago Castillo
  Summary: Biophysics. Action potential simulation, modelling ionic channels currents using differential equations and Markov Chains formalism with an object-oriented programming approach.

Universidad Autónoma del Estado de México.
Toluca, Estado de México, México

- B.Sc. in Physics — Mar 2003 – May 2008

  Thesis: A Study of Solitonic Structures in DNA's Vibrational Dynamics.
  Adviser: Dr. Maximo Agüero Granados
  Summary: Mathematical description and solitonic solutions of DNA's vibrational dynamics under Peyrard-Bishop model.

PUBLICATIONS

JOURNALS

[1] M. Carrillo, J. A. González, C. López and A. Raya "Bloch oscillations in a two-dimensional crystals: Inverse problem", *Computational Materials Science, Elsevier,* vol. 137, pp. 1–5, Sep 2017.

[2] M. Carrillo, U. Salinas and J. A. González “Estimation of the Reynolds number for flows around a cylinders with lattice Boltzmann methods and artificial neural networks”, *Phys. Rev. E*, vol. 12, no. 4, pp. 330–352, Dec 2016.

[3] M. Carrillo, M. Gracia, J. A. González and F. Guzmán “Parameter estimates in binary black hole collisions using neural networks”, *Gen. Rel. Grav.*, vol. 12, no. 4, pp. 330–352, Sep 2016.

[4] M. A. Agüero, M. De Lourdes Najera, and M. Carrillo, “Nonclassic solitonic structures in DNA’s vibrational dynamics”, *Int. J. Mod. Phys. B*, vol. 22, no. 16, pp. 2571–2582, Jun 2008.

SUBMITTED PAPERS

[1] M. Carrillo, C. López, J. A. González and U. Salinas “Estimation of an obstruction in a flow with artificial neural networks”, Submitted to: *Phys. Rev. E*

PROCEEDINGS

[1] M. Carrillo, U. Salinas and J. A. González, “Estimation of the Reynolds number in a Poiseuille flow using artificial neural networks”, in *Proceedings of the VIII International Congress of Engineering Physics*, Mérida, Yucatán, México, Nov 2016.

[2] M. Carrillo, J.A. González, M. Gracia-Linares and F. S. Guzmán, “Time series analysis of Gravitational Waves signals using neural networks”, in *Proceedings of the X Mexican School on Gravitation and Mathematical Physics*, Playa del Carmen, Quintana Roo, México, Dec 2014.

TALKS

- *Time series analysis with neural networks: some examples*, Workshop for Time Series and Correlation Analysis, Cuernavaca, Morelos, México, Aug 2015.
- *Análisis de series de tiempo mediante redes neuronales*, Universidad TecMilenio, Morelia, Michoacán, México, Aug 2015.

RESEARCH INTERESTS

- Application and programming of Machine Learning methods (artificial neural networks, genetic algorithms, naive Bayes, etc.) and Statistical Programming for pattern recognition, data analysis and parameter inference for problems in Physics.
- Signal & Image Processing.
- Computational Physics simulations.

LEARNING INTERESTS

- Deep learning.
- Parallel programming with MPI and CUDA.

LANGUAGES

- Spanish: Native language.
- English: Fluent (speaking, reading, writing).

SKILLS

- C# (advance), Python (intermediate and learning), R (intermediate and learning), MATLAB (basic), SQL (basic and learning), Mathematica (basic), Processing (basic).
- Others: Windows, Linux, IPython, TensorFlow (basic and learning), LaTex, Microsoft Word, Microsoft Excel, Microsoft PowerPoint.

INTERESTS

- Photography, writing, reading, cactux cultivation & swimming.

REFERENCES

- **Dr. José Antonio González Cervera**
  Researcher & Professor.
  Instituto de Física y Matemáticas,
  Universidad Michoacana de San Nicolás de Hidalgo
  gonzalez@ifm.umich.mx

- **Dr. Francisco Guzmán Murillo**
  Researcher & Professor.
  Instituto de Física y Matemáticas,
  Universidad Michoacana de San Nicolás de Hidalgo.
  guzman@ifm.umich.mx

- **Dr. José Antonio De Santiago Castillo**
  CEO Reliotech and Former Researcher
  Reliotech S.A.S. de C.V
  desantiago@reliotech.com