Cristian Enrique Muñoz Villalobos

CONTACT INFORMATION

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RESEARCH INTERESTS

Deep Learning for Multiple Data Types: machine learning | data mining | deep learning | big data | cloud computing | natural language processing | computer vision | gpu computing | optimization | high performance computing | distributed computing

AWARDS AND HONOURS

- Deep Learning Instructor - Certified Instructor Program NVIDIA 2019.
- AI Ambassador - Intel Corporation, 2018.
- Doctoral Scholarship, National Council for Scientific and Technological Development, Brasil 2015.
- 1st place at Visualizing Evolution Competition VizGEC, GECCO. Association for Computing Machinery Special Interest Group on Genetic and Evolutionary Computation, 2013.
- Master Scholarship NOTA 10, competitive award from the State Agency for Research, 2012.
- Master Scholarship, Brazilian Coordination of High-Level Personnel Training, 2012.

EDUCACIÓN

Pontifical Catholic University of Rio de Janeiro, Rio de Janeiro, Brasil

Ph.D. Electrical Engineering, August 2015 to August 2019

- Thesis title: *Knowledge Extraction from text documents using Augmented Memory Networks*
- Advisor: Professor Ricardo Tanscheit

M.Sc. Electrical Engineering, March 2012 to March 2014

- Thesis title: *Heterogeneous Parallelization for Quantum Inspired Linear Genetic Programming*
- Advisor: Professor Marco Aurelio Cavalcanti Pacheco

National University of Engineering, Lima, Perú

B.Sc., Mechanical Engineering, June 2005 to July 2010

- Mechatronics Engineering (emphasis on artificial intelligence and digital computers)
- Minor in Control Systems (programming and algorithms)

PROFESSIONAL EXPERIENCE

Holistic AI, London, United Kingdom

Senior Research | Machine Learning Engineer **May 2022 to present**

- Working on AI ethics. How do we ensure trust in AI?
- Develop tool to analyze and mitigate AI technical risks.
- Develop an open-source tool to assess and improve the trustworthiness of AI systems.

Applied Computational Intelligence Laboratory, Rio de Janeiro, Brasil

Consultant Data Scientist **May 2022 to present**

- Advise on the design of solutions using AI.

Senior Data Scientist **March 2018 to April 2022**

- Coordinate development team activities.
- Ensuring implementation of policies and practices .
- Design Deep Learning models for NLP and CV Applications .
- Integrate services with Cloud Computing and Clusters .

Junior Data Scientist **March 2012 to 2018**

- Developing software using Shell, C++ and C# .
- Management Cluster using Resource Manager PBS Torque and SLURM .
- Version Control using Git .
- Working by Scrum framework .

Alloy Metal Factory - FAMETAL, Lima, Perú

Researcher and Programmer **May 2010 to January 2012**

- Design mechanic components of electrical boards (CAD).
- Stress analysis simulation of metal structures (CAE).
- Programming CNC Machines for development of mechanical components in sheet metal (CAM).

Teaching Experience

Specialization and Extension Courses (CCE PUC-Rio), Rio de Janeiro, Brasil

Assistant Professor **March 2016 to present**

- Decision Support Methods in Python (Coordinator: Marco A. Pacheco)
- Introduction to MATLAB (Coordinator: Marco A. Pacheco)
- Deep Learning (Coordinator: Marco A. Pacheco)

Pontifical Catholic University of Rio de Janeiro (PUC-Rio), Rio de Janeiro, Brasil

Instructor **March 2016 to March 2019**

- ELE 2399: Fuzzy Logic (Master Course)
- ELE 2762: Deep Learning (Master course)
- ENG 1361: Applied Computational Intelligence (Undergraduate Course)

Instructor **August 2015 to March 2016**

- ENG 1448: Digital Systems (Undergraduate Course)
- ELE 2761: High Performance Computing (Master Course)
- ELE 2395: Evolutionary Computing (Master Course)

Research Experience

Pontifical Catholic University of Rio de Janeiro, RJ, Brazil

Applied Computational Intelligence Laboratory **March 2012 to present**

Project development in Finance, Energy, and Oil & Gas areas. Parallel and distributed computing, optimization and machine learning techniques was used for computer vision and natural language processing tasks.

- BIG ANCHORING Project: (Advisor) Creating of Data Lake repositories for Big Data applications. Connect different source databases and applications using Kafka.
- PROXY Project: (Advisor) Create a proxy model for reservoir simulator using deep learning models.
- BIG OIL Project: (Advisor) Creating of Data Lake repositories for Big Data applications. Information retrieval from text documents and videos using Deep Learning techniques.
- OCTOPUS 3 project: Increase the computation power using distributed system: resource managers like Torque PBS and implement new functionalities using Hadoop platform.
- OCTOPUS 2 Project: Well location optimization system for Petrobras. The system is able to choose the best configuration of wells (and their types) given the oil field, in order to maximize the net present value (NPV).
- APOGEU Project: Intelligent system to support the management of contracting services that allow: Formation of standard prices, more accurate analysis of proposals, improvement of the negotiation of proposals, monthly monitoring of contract costs and inference and monitoring of indicators.
- PrevIn Project: Intelligent system to support the management of energy efficiency, capable of identifying and prioritizing customers that present opportunities to reduce demand and consumption, capable of guiding consumers to conserve and use electricity rationally.

Patents

1. METHOD FOR EXTRACTING AND STRUCTURING INFORMATION. Registered on November 26, 2021. Patent number BR 10 2021 023977-8.

Books and Publications

1. Leonardo Forero, Cristian Enrique M. Villalobos, Harold De Mello, Cesar Valencia; and Alvaro Orjuela. "Sentimental Analysis on Social Media Comments with Recurring Models and Pretrained Word Embeddings in Brazilian Portuguese", NLPIR 2022, Bangkok, Thailand (2022).
2. Potratz, Júlia; Cristian Enrique M. Villalobos; Smith WA Canchumuni; and Marco Aurélio C. Pacheco. "Deep learning for mapping rainwater drainage networks using Remote Sensing Data", CILAMCE 2021, Rio de Janeiro - Brazil (2021).
3. Jose D. Bermudez Castro ; Smith WA Canchumuni; Cristian E. Muñoz Villalobos ; Fábio Corrêa Cordeiro ; Antônio Marcelo Azevedo Alexandre ; and Marco A. Cavalcanti Pacheco. Ïmprovement Optical Character Recognition for Structured Documents using Generative Adversarial Networks", ICCSA 2021, Cagliari - Italy (2021).
4. Cordeiro, Fábio Corrêa ; Villalobos, Cristian Enrique Munoz . Petrolês - How to Build a Specialized Oil and Gas Corpus in Portuguese. Rio Oil and Gas Expo and Conference, v. 20, p. 387-388, 2020.
5. Cristian Muñoz, Leonardo Mendoza and Ricardo Tanscheit "Construction of a Transformer-based model for Relation Extraction", CBIC 2019, Belén - Brazil (2019)
6. Jose David Bermudez Castro, Ricardo Rei, Jose E. Ruiz, Pedro Achanccaray Diaz, Smith Arauco Canchumuni, Cristian Muñoz Villalobos, Felipe Borges Coelho, Leonardo Forero Mendoza, Marco Aurelio C. Pacheco "A free web service for fast COVID-19 classification of chest X-Ray images", arXiv:https://arxiv.org/abs/2009.01657
7. Costa, Leandro Santos DA ; Blank, Frances Fischberg ; Oliveira, Fernando Luiz Cyrino ; Villalobos, Cristian Enrique Muñoz . Conditional Pricing Model with Heteroscedasticity: Evaluation of Brazilian Funds. RAE-Revista de Administracao de Empresas, v. 59, p. 225-241, 2019.
8. Arthur Silveira, Cristian Muñoz and Leonardo Mendoza "Severe Asthma Exacerbations Prediction Using Neural Networks", EANN 2019, Crete - Greece (2019)
9. Leonardo A. Forero Mendoza, Cristian Muñoz, Manoela Kohler, Evelyn Batista and Marco A. Pacheco "Analysis and Classification of Voice Pathologies using Glottal Signal Parameters with Recurrent Neural Networks and SVM", ICAART 2019, Prague - Czech Republic (2019)
10. Gabriel Lins Tenorio, Cristian E. Muñoz Villalobos, Leonardo A. Forero Mendoza, Eduardo Costa da Silva and Wouter Caarls, "Improving Transfer Learning Performance: an Application in the Classification of Remote Sensing Data", ICAART 2019, Prague - Czech Republic (2019)
11. Juan G. Lazo Lazo, Rogério Póvoa, Cristian E. Muñoz V., "Arrears identification for markets of large customers and public sector", CITENEL, Rio de Janeiro, Brasil (2013)
12. Pedro Achanccaray, Cristian Muñoz, Luis Rojas and Ricardo Rodriguez, "Human Computer Interface based on hand tracking", Accepted to be presented in MUSME 2011,V-3478-2011, pag. 293, October 25-28-2011, Valencia, España (2011)
13. Cristian E. Muñoz V.,Oscar A. Villalta R., Alhiet Orbegoso, "Matlab 2010", MACRO E.I.R.L. (2010)

References Available to Contact

Ph.D. Juan G. Lazo Lazo (e-mail: jg.lazol@up.edu.pe)
- Professor, Universidad del Pacífico
- ⋆ *Ph.D. Lazo was my supervisor in many research projects at ICA laboratory.*

Ph.D. Leonardo Forero Mendoza (e-mail: mendonza@ele.puc-rio.br)
- Professor, Universidade do Estado do Rio de Janeiro,
- ⋆ *Ph.D. Mendoza has been a valuable interdisciplinary resource to me.*

Ph.D. Douglas Mota Dias (e-mail: douglasm@ele.puc-rio.br)
- Professor, Universidade do Estado do Rio de Janeiro,
- ⋆ *Ph.D. was my master supervisor.*

Ph.D. Marco A. Pacheco Cavalcanti (e-mail: marco@ele.puc-rio.br)
- Professor, Pontifical Catholic University of Rio de Janeiro,
- ⋆ *Ph.D. Marco Aurelio was my advisor during my masters studies.*

Languages

Spanish, Portuguese, English.