Cristóvão Freitas Iglesias Junior

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Summary

I am a Data Scientist with solid knowledge of Software Engineering. My experience, accumulated since 2009, covers several projects, from molecular dynamics simulations to digital twins development. I am currently a Ph.D. student in Computer Science and a Research Assistant at the University of Ottawa (Canada), and **my publications are in Machine Learning (Deep Learning, EKF, Bayesian Networks, NLP), Data Fusion, Agile development, and Software Engineering.**

Education

2020/9 – **2023/12**	**Ph.D. in Computer Science, University of Ottawa (Canada)** **Supervisor: Miodrag Bolic** Thesis proposal: Enabling the digital twins development in biomanufacturing through Scientific Machine Learning. Number of publications: 4 papers
2017/9 - 2019/10	**M.Sc. in Informatics, Federal University of Rio de Janeiro (Brazil)** **Supervisor: Claudio Miceli de Farias** Master dissertation: DOMA - An Approach to Domain Modeling of Personalized Monitoring Systems Number of publications: 1 paper
2016/9 - 2019/11	**B.Sc. in Information Systems, Estácio de Sá University (Brazil)** **Supervisor: Claudio Miceli de Farias** Monograph: Personalized Monitoring System For Intelligent Bandwidth Control
2008/3 - 2013/3	**B.Sc. in Biophysics (Bioinformatics), Federal University of Rio de Janeiro (Brazil)** **Supervisors: Cheng Soon Ong; Pedro Geraldo Pascutti** Monograph: REDE - Interactive Online View Of Epistatic Networks.

Skills

Areas of Research: Data Fusion, Internet of Things, Scientific Machine Learning, Software Engineering, Bioinformatics, Data Science, Bayesian Inference and Data mining

Development: Database, R, C++, Python, JAVA, Ruby on Rails, Julia, MatLab, Javascript, Elasticsearch, Kibana, Beats, and Logstash, Numpy, TensorFlow, PyTorch

Languages

English - Understand Well, Speak Well, Write Well, Read Well
Spanish - Understand Well, Speak Reasonable, Write Well, Read Well
Portuguese - Native

Some of Professional experiences

2021/01 – current - Research Assistant | Project: **AI and machine learning for development of digital twins for Bioreactors. Project developed using Scientific machine learning, Deep learning and Bayesian inference via R, Julia and Python.**
Health Devices Research group (HDRG) - University of Ottawa - **Canada**

2020/8 – 2020/12 - Research Assistant | Project: **A Real-Time Respiration Monitoring and Classification System using a Depth Camera and Radars.** Project developed using machine learning models and python.
Health Devices Research group (HDRG) - University of Ottawa - **Canada**

2020/2 – 2020/8 - Research Assistant | Project: **Monitoring elderly people in nursing homes. Project developed using python, cameras and movement sensors.** Health Devices Research group (HDRG) - University of Ottawa - **Canada**

05/2019 – 2019/10 - Web Development Professor | Project: **Schedule your future with Web Development using HTML, CSS and Javascript.** Mundial and Maré Bank - **Brazil**

03/2017 - 04/2019 - Software Development Analyst | Project: **Development of new functionalities for BART, SADI and OCTOPUS products using Python and Ruby on Rails.** Clavis Segurança da Informação - **Brazil**

09/2014 - 03/2015 - Software Developer | Project: **Development of plugins for Redmine using Ruby on Rails and PostGreSQL.** EMC2-**Brasil**

12/2012 - 03/2013 - Software Developer (Internship) | Project: **Development of a visualization and analysis tool for the web in the GWAS area, to work with genomic data. Project developed using JavaScript, Python, D3.js.** Available in: https://github.com/chengsoonong/rede and http://bl.ocks.org/chengsoonong/raw/9968465/# NICTA, Bioinformatics Group – **Australia**

01/2011 - 02/2011 - Bioinformatics Researcher (Internship) | Project: **Study the initial steps of activation of BAX by BIM (BH3) through normal modes analysis of the vibration (NMA) and analyze the modes consensus**. Ecole Normale Supérieure de Cachan, Laboratoire de Biotechnologie et Pharmacologie Génétique Appliquée – **France**

03/2009 - 01/2011 - Bioinformatics Researcher (Internship) | Project: **Molecular Dynamics Simulation for drug design.** Project developed using C/C++, Python, R and Data Mining techniques. Health Sciences Center, Federal University of Rio de Janeiro - Brazil, Modeling and Molecular Dynamics Laboratory – **Brazil**

Awards

2013 **Best work of the Section**, XXXV Giulio Massarani Journey of Scientific Initiation, Technological, Artistic and Cultural of UFRJ
2013 **Best work of the Unity (Institute of Biophysics Carlos Chagas Filho)**, XXXV Giulio Massarani Journey of Scientific Initiation, Technological, Artistic and Cultural of UFRJ
2012 **Best work of the Section (Institute of Biophysics Carlos Chagas Filho)**, XXXIV Giulio Massarani Journey of

Scientific Initiation, Technological, Artistic and Cultural of UFRJ
2010 **Honorable Mention of the Health Sciences Center**, XXXII Giulio Massarani Journey of Scientific Initiation, Technological, Artistic and Cultural of UFRJ

Publications

1. Iglesias, Jr Cristovão, et al. **"An Architectural Design Decision Model for Resilient IoT Application"** (arXiv preprint arXiv.2306.10429, doi.org/10.48550/arXiv.2306.10429, in 2023/6/17).

2. Iglesias, Jr Cristovão, et al. **"Automated Extraction of IoT Critical Objects from IoT Storylines, Requirements and User Stories via NLP"** (*10th IEEE Swiss Conference on Data Science in* 2023).

3. Iglesias, Jr Cristovão, et al. **"DEMDE: Decision Making Design based on Bayesian Network for Personalized Monitoring System"** (*2023 26th International Conference on Information Fusion (FUSION)*. IEEE, 2023).

4. Iglesias, Jr Cristovão, et al. **"Monitoring the Recombinant Adeno-Associated Virus Production by Extended Kalman Filter"** (*Processes Journal in* 2023).

5. Jr Cristovão, et al. **"rAAV Manufacturing: the Challenges of Soft Sensing During Upstream Processing"** (Bioengineering Journal in 2023).

6. He, S., Han, Z., Iglesias, C., Mehta, V., & Bolic, M. (2022). **A Real-Time Respiration Monitoring and Classification System using a Depth Camera and Radars**. *Frontiers in physiology*, 352.

7. Iglesias, Jr Cristovão, et al. "**Handling Massive Proportion of Missing Labels in Multivariate Long-Term Time Series Forecasting.**" *Journal of Physics: Conference Series*. Vol. 2090. No. 1. IOP Publishing, 2021.

8. Iglesias, Cristóvão, Claudio Miceli, and David Silva. "**A Domain Model for Personalized Monitoring System Based on Context-Aware Data Fusion.**" *2019 22th International Conference on Information Fusion (FUSION)*. IEEE, 2019.

9. Gomes Filho A, Resende C, Iglesias C, Mayworm J, Jardim M, Paiva R, Toledo R. (2017). **Agile Software Development Learning through Open Hardware Project.** IEEE Xplore® digital library. 2015 6th Brazilian Workshop on Agile Methods (WBMA)
   Conference Date: 2015/10

Submitted Papers

1. Iglesias, Jr Cristovão, et al. **"How To NOT Make the Joint Extended Kalman Filter Fail with Unstructured Mechanistic Models"** (Submitted to Scientific Report in 2023).

Working Papers

1. Iglesias, Jr Cristovão, et al. **"Bayesian Inference for JEKF parameters estimation"** (submission in 2023).

2. Iglesias, Jr Cristovão, et al. **"Expected training set for Handling Massive Proportion of Missing Labels - Applied in Multivariate Multi-Step Time Series models for Forecasting with Uncertainty"** (submission in 2023).

3. Iglesias, Jr Cristovão, et al. **"S2FES: Smart sampling of three-dimensional structure of biological molecules from Free Energy Surface"** (submission in 2023).