Full Version - Curriculum Vitae
Jose Luis L.J. Silva

I am a PhD candidate in Physics at Uppsala University working with computational physics. In my thesis, I worked with simulations of materials for hydrogen production. This project is jointly a theory-experiment effort for the development of new operando spectroscopy techniques to probe solid-liquid interfaces. I have daily experience with programming languages such as Python, ShellScript, C/C++ and Matlab. I have also experience with Multi-scale simulations using different packages - (Molecular Dynamics in Gromacs, Monte Carlo Dynamics, VASP, Quantum Espresso, Gaussian 09 and Jaguar). I am passionate about algorithm development and optimization techniques. I have been also exploring applications of Aritifial Intelligence, Machine Learning and Deep Learning into diferente fields. This curiosity led me to experience working as Research Engineer within Machine Learning and Reinforcement Learning techniques at Veoneer (Computer Vision team) for self-driving cars. The topic of my research was entitled: Tracking multiple targets using Reinforcement Learning Techniques: LSTM and Markov Decision Processes.

Personal Information

Full name:	Jose Luis Lima de Jesus Silva
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Formal Education

2016 - June 2020

Ph.D in Physics
Uppsala University, Uppsala, Sweden
Position: Ph.D Student in Physics regarding Energy Materials.
Employment: Department of Physics and Astronomy, Division of Materials Theory

2016 - 2019

Licenciate of Philosophy in Physics
Specialization in Atomic, Molecular, Condensed Matter Physics
Uppsala University, Uppsala, Sweden

Employment: Department of Physics and Astronomy, Division of Materials Theory

2013 - 2015

Master of Science in Physics
Federal University of Bahia, UFBA, Salvador, Brazil
Dissertation title: Absorption effects of photocatalysts on (110) Rutile TiO2 surface using
Advisor: Denis Gilbert Francis David
Scholarship: Coordination for the Improvement of Higher Education Personnel (CAPES)

Bachelor of Science in Physics
Federal University of Bahia, UFBA, Salvador, Brazil
Scholarship: Coordination for the Improvement of Higher Education Personnel (Cnpq)

Professional Experience in Research and Teaching

2018 – 2019

Position: Teaching Assistant ; **Department:** Physics and Astronomy
Course: Mekanik Baskurs

2019 - 2019

Position: Research Engineer Summer Intern ; **Company: Veoneer**
Research: Tracking multiple targets using Reinforcement Learning Techniques: LSTM and Markov Decision Processes

2013 - 2015

Position: Assistant Teacher at Federal University of Bahia
Position: Assistant Teacher at Devry University
Department: Earth and the environment Physics

Schemes of job: Temporary
Contract hours: 20 hours/week
Courses: General and Experimental Physics I (Mechanics), General and Experimental Physics II (Oscilations, Waves and Thermodynamics) and Mechanics of Materials I, II.

2012 - 2015

Position: Master in Physics
Group: LaPO (Laboratory of Optical Properties)
Schemes of job: Full-time
Scholarship: Coordination for the Improvement of Higher Education Personnel (CAPES)

2011 - 2012

Position: Junior Technological Research
Schemes of job: Full-time
Project: Modeling and fractal characterization of invasion fronts in petroleum reservoirs.
Contract hours: 20 hours/week
Scholarship: National Council for Scientific and Technological Development (CNPq)

2010 - 2011

Contract: Junior Scientific Research
Group: SICLAM (Computational Simulation of Liquids and Molecular aggregates)
Schemes of job: Full-time
Project: Computer Simulation of Molecular Nanostructures and Extended Systems.
Contract hours: 20 hours/week
Scholarship: National Council for Scientific and Technological Development (CNPq)

2010 - 2010

Contract: Junior Scientific Research
Group: SICLAM (Computational Simulation of Liquids and Molecular aggregates)
Schemes of job: Full-time
Project: Study of magnetic properties in paramagnetic aggregates using first principles calculations.
Contract hours: 20 hours/week
Scholarship: National Council for Scientific and Technological Development (CNPq)

Complementary Education/Schools and Events

2018 – 2018

CoTXS meeting in theoretical spectroscopy
Seminar: XPS - spectroscopy of Ru complex in aqueous environment
Uppsala University, Uppsala, Sweden

2017 – 2017

Introduction to Data Science, 2017
Uppsala University, Uppsala, Sweden

2017 – 2017

Certificate Fundamentals and Applications of Heterogeneous Catalysis, SUNCAT Summer Institute 2017 – Presentation of "Nanodevices as micro-reactors for studying hydrogen evolution reaction"
Stanford University, California, USA

2016 – 2016

Certificate from College on Multiscale Computational Modeling of Materials for Energy Applications.
ICTP, Trieste, Italy

2016 - 2016

Certification in High Performance Computing, PDC Summer School.
KTH, Stockholm, Sweden

2016 - 2016

CAPES-Stint Second Workshop
Seminar: Theoretical x-ray spectroscopy of redox reactions: The case of Ru Complexes electrocatalysts
Natal, RN, Brazil

2014 - 2014

Certificate of School on Electronic Structure and Quantum Transport Methods.
ICTP-SAIFR, UNESP, São Paulo, Brazil

2012 – 2012	**Short Term Course Certificate in Ions and electron accelerators.** Federal University of Bahia, UFBA, Salvador, Brazil
2012 - 2012	**Short Term Course Certificate in DFT semiconductor materials study.** Federal University of Bahia, UFBA, Salvador, Brazil
2012 - 2012	**Short Term Course Certificate in Thin Films applied to solar energy.** Federal University of Bahia, UFBA, Salvador, Brazil
2012 – 2012	**Short Term Course Certificate in Molecular Orbital Theory.** Federal University of Bahia, UFBA, Salvador, Brazil
2012 - 2012	**Short Term Course Certificate in Topics in Field Theory.** Federal University of Bahia, UFBA, Salvador, Brazil
2011 - 2011	**Short Term Course Certificate in Solar Energy.** Federal University of Bahia, UFBA, Salvador, Brazil
2011 - 2011	**Winter School in Medical Physics.** São Paulo University, USP, São Paulo, Brazil
2011 - 2011	**VI EVFITA Physics Summer School.** **Seminar:** Study of magnetic properties in paramagnetic aggregates using first principles calculations. **Aeronautics Institute of Technology ITA**, São Jose Dos Campos, Brazil

Recent Projects:

Jsneural Networks in Python from scratch
https://github.com/jseluis/deep_learning/

This is an open-source project for learning how to build Deep Neural Networks using Stochastic Gradient Descent from scratch.

Autonomous Vehicles, Computer Vision, Optimization, Deep Learning, Autonomous Systems and more ⋯
https://github.com/jseluis/

Series of open-source pipelines to explore applications of Computer Vision and Deep Learning for self-driving vehicles.

Aicavity "Learn By Doing"
https://aicavity.com

Platform with online training and tutorials in Coding and Engineering, including recent Techniques of Machine Learning, Deep Learning and Artificial Intelligence. The platform Provides free courses through an Youtube Channel:
https://www.youtube.com/channel/UC94TU0rgoBsvLldMxaIP8oQ
(Portuguese and English)

Personal Website
https://jseluis.com

Here you can find a list of projects, publications, conferences, GitHub repositories and more informations about what I have been doing in my career.

Author: Jose Luis Silva, Silva, J.L

Publication List

1. Silva, J.L., Unger, I., Matias, T., Franco, L., Damas, G.B., Costa, L.T., Toledo, K.C.F., Rocha, T.C.R., Saak, C.M., Coutinho, K., Araki, K., Björneholm, O., Brena, B. and Araujo, C.M., 2019. **X-ray Photoelectron Fingerprints of High-Valent Ruthenium-Oxo Complexes Along the Oxidation Reaction Pathway in Aqueous Environment.** *The Journal of Physical Chemistry Letters*.
https://pubs.acs.org/doi/abs/10.1021/acs.jpclett.9b02756

2. Silva, J.L., Brena, B. and Araujo, C.M., 2020. **g-C_3N_4/WTe_2 hybrid electrocatalyst for efficient hydrogen evolution reaction.** *The Journal of Physical Chemistry C*
https://pubs.acs.org/doi/10.1021/acs.jpcc.9b11982

3. Zhou, Y., Silva, J.L., Woods, J.M., Pondick, J.V., Feng, Q., Liang, Z., Liu, W., Lin, L., Deng, B., Brena, B., Xia, F., Peng, H., Liu, Z., Wang, H., Araujo, C.M. and Cha, J.J., 2018. **Revealing the contribution of individual factors to hydrogen evolution reaction catalytic activity.** *Advanced Materials*, *30*(18), p.1706076.
https://doi.org/10.1002/adma.201706076

4. Zhou, Y., Pondick, J.V., Silva, J.L., Woods, J.M., Hynek, D.J., Matthews, G., Shen, X., Feng, Q., Liu, W., Lu, Z., Liang, Z., Brena, B., Cai, Z., Wu, M., Jiao, L., Hu, S., Wang, H., Araujo, C.M. and Cha, J.J., 2019. **Unveiling the Interfacial Effects for Enhanced Hydrogen Evolution Reaction on MoS2/WTe2 Hybrid Structures**. *Small*, *15*(19), p.1900078.
https://doi.org/10.1002/smll.201900078

5. Lanzilotto, V., Silva, J.L., Zhang, T., Stredansky, M., Grazioli, C., Simonov, K., Giangrisostomi, E., Ovsyannikov, R., De Simone, M., Coreno, M., Araujo, C.M., Brena, B. and Puglia, C., 2018. **Spectroscopic Fingerprints of Intermolecular H-Bonding Interactions in Carbon Nitride Model Compounds.** ***Chemistry****–A European Journal*, *24*(53), pp.14198-14206.
https://doi.org/10.1002/chem.201802435

6. Pavliuk, M.V., Gutiérrez Álvarez, S., Hattori, Y., Messing, M.E., Czapla-Masztafiak, J., Szlachetko, J., Silva, J.L., Araujo, C.M., A. Fernandes, D.L., Lu, L., Kiely, C.J., et al., 2019. **Hydrated Electron Generation by Excitation of Copper Localized Surface Plasmon Resonance**. *The Journal of Physical Chemistry Letters*, *10*(8), pp.1743-1749.
https://pubs.acs.org/doi/10.1021/acs.jpclett.9b00792