Héber Hwang Arcolezi

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Postdoctoral researcher with expertise in data privacy and privacy-preserving machine learning. I am passionate about research and committed to the creation and development of high-quality solutions.

Education

2019 – 2022	**Ph.D. in Computer Science:** University Bourgogne Franche-Comté (UBFC), France. **Research:** Production of Categorical Data Verifying Differential Privacy: Conception and Applications to Machine Learning. **Funding:** CADRAN project, Region Bourgogne Franche-Comté.
2017 – 2019	**M.Eng. in Electrical Engineering:** São Paulo State University (UNESP), Brazil. **Research:** A Novel Robust and Intelligent Control Based Approach for Human Lower Limb Rehabilitation via Neuromuscular Electrical Stimulation **Funding:** Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES).
2012 – 2017	**B.Eng. in Electrical Engineering:** Mato Grosso State University (UNEMAT), Brazil. **Research:** Um Estudo Complementar ao Projeto de Controle PID no Caso do Pêndulo Invertido. **Funding:** UNEMAT Grant.

Work Experience

2022-02 - Present	**Postdoctoral Researcher at Comète team - Inria, LIX:** Research on local differential privacy, machine learning privacy, and machine learning fairness, hosted by DR1 C. Palamidessi.
2022-04 - Present	**Teaching Assistant on Introduction to Computer Science with Java at École Polytechnique:** Assist students enrolled in the discipline and evaluate students' tests.
2022-01 - 2022/01	**Visiting Researcher at Universidade Federal de Minas Gerais (UFMG):** Investigation of machine learning solutions for applications in medicine, hosted by Pr. L. de L. Cisneros.
2021-11 - 2021-12	**Visiting Researcher at Université du Québec à Montréal (UQAM):** Research on privacy-preserving data analytics with local differential privacy, hosted by Pr. S. Gambs.
2021-03 - 2021-05	**Teacher at Workshop on Privacy for IoT at Master IoT UBFC:** Theory and practical methods of anonymization for students of Master 1.
2020-11 - 2020-12	**Teacher at Workshop on Privacy for IoT at Master IoT UBFC:** Theory and practical methods of anonymization for students of Master 2.
2016-01 - 2016-12	**Co-Founder and Voluntary Member at "Energy Electrical Projects and Consulting Junior Enterprise":** Low and high tension electrical projects; optical fibers and telecommunications projects; and consulting.
2014-01 - 2014-06	**Voluntary Tutor on Differential and Integral Calculus at UNEMAT:** Assist students enrolled in the discipline, dedicate and plan activities to develop student learning.

Top 5 Publications

2021	Privacy-Preserving Prediction of Victim's Mortality and Their Need for Transportation to Health Facilities. IEEE Transactions on Industrial Informatics (**impact factor 10.215**).

2021	Random Sampling Plus Fake Data: Multidimensional Frequency Estimates With Local Differential Privacy. Int. Conference on Information and Knowledge Management (**rank A**).
2021	Machine learning-based forecasting of firemen ambulances' turnaround time in hospitals, considering the COVID-19 impact. Applied Soft Computing (**impact factor 6.725**).
2021	RISE Controller Tuning and System Identification Through Machine Learning for Human Lower Limb Rehabilitation via Neuromuscular Electrical Stimulation. Engineering Applications of Artificial Intelligence (**impact factor 6.212**).
2020	Forecasting the Number of Firefighter Interventions per Region with Local-Differential-Privacy-Based Data. Computers & Security (**Impact factor 4.438**).

Software

Python	Multiple Frequency Estimation Under Local Differential Privacy in Python: multi-freq-ldpy. MIT License, GitHub.

Expertise

Privacy-Preserving	● Conception and application of global, shuffle, and local differential privacy protocols for statistical learning. ● Application of syntactic anonymization methods for privacy-preserving data publishing. ● Development of machine learning models with differential privacy guarantees.
Machine Learning	● Development of machine learning and deep learning methods for regression and time series forecasting tasks. ● Development of machine learning and deep learning methods for classification (binary, multiclass, and multi-output) tasks.
Control System	● Design and implementation of closed-loop linear and nonlinear control methods. ● Identification of linear and nonlinear systems with mathematical and black-box methods.
Optimization	● Development and utilization of linear and metaheuristic optimization methods.
Biomedical	● Conducting practical rehabilitation experiments on people with spinal cord injury through automatized methods.

Tools

Programming languages:	Python, Java, Matlab & Simulink, Visual Basic.
Libraries:	Keras, TensorFlow, TensorFlow Privacy, PyTorch, Scikit-Learn, Matplotlib, Pandas, Numpy, GEKKO, Scipy, Sympy, Ray, Numba, Scikit-fuzzy.
Operating Systems:	Linux (Debian and Ubuntu) and Windows 7/10/11.
Others:	MySQL, ARX anonymization tool, Labview, Sun Grid Engine (SGE), Latex, MS Office, AutoCAD, AltoQI Lumine, Multisim.

Languages

Portuguese	Mother Tongue
English	Advanced - C1
French	Intermediate - B2
Spanish	Intermediate - B2