

Héber Hwang Arcolezi

 [hharcolezi.github.io/](https://github.com/hharcolezi)

 heber.hwang-arcolezi@inria.fr

 [Inria Saclay](#), Palaiseau, 91120, France



Research Interest: Differential Privacy | Information Security | Artificial Intelligence | Algorithmic Fairness.

Employment

Feb 2022 – Present **Postdoctoral Researcher:** [Comète team](#) – [Inria](#), [LIX](#), France.
Research: Local differential privacy and ethical aspects of machine learning.
Funding: [ERC Project HYPATIA](#).
Supervisor: [Catuscia Palamidessi](#).

Education

2019 – 2022 **Ph.D. in Computer Science:** University Bourgogne Franche-Comté ([UBFC](#)), France.
Laboratory: [FEMTO-ST](#) (Franche-Comté Electronique Mécanique Thermique et Optique – Sciences et Technologies).
Research: Production of Categorical Data Verifying Differential Privacy: Conception and Applications to Machine Learning [[thesis link](#)].
Funding: CADRAN project, Region Bourgogne Franche-Comté.
Supervisor: [Jean-François Couchot](#), Univ. Bourg. Franche-Comté, Besançon, France.
Co-supervisor: [Bechara Al Bouna](#), Université Antonine, Hadat-Baabda, Lebanon.
Co-supervisor: [Xiaokui Xiao](#), National University of Singapore, Singapore.
Defense date: 5th January 2022.
Dissertation jury: [Mathieu Cunche](#), *Rapporteur*, INSA Lyon; [Benjamin Nguyen](#), *Rapporteur*, INSA Centre Val de Loire; [Mário S. Alvim](#), *Examineur*, Universidade Federal de Minas Gerais; [Stéphane Chrétien](#), *Examineur*, Université Lyon 2.

2017 – 2019 **M.Eng. in Electrical Engineering:** São Paulo State University ([UNESP](#)), Brazil.
Laboratory: [LIEB](#) (Laboratório de Instrumentação e Engenharia Biomédica).
Research: A Novel Robust and Intelligent Control Based Approach for Human Lower Limb Rehabilitation via Neuromuscular Electrical Stimulation [[thesis link](#)].
Funding: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES).
Supervisor: [Aparecido Augusto de Carvalho](#), São Paulo State University, Brazil.
Defense date: 19th August 2019.
Dissertation jury: [Marcelo A. A. Sanches](#), São Paulo State University; [Raphaël Couturier](#), University Bourgogne Franche-Comté.

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 (in Portuguese) [[thesis link](#)].
Supervisor: [Rogério B. Quirino](#), Mato Grosso State University.
Defense date: 20th July 2017.
Dissertation jury: [Rogério Lúcio Lima](#), Mato Grosso State University; [Maria Helena Vieira Kelles](#), Mato Grosso State University.

Mobility

Oct–Dec 2022 **Visiting Postdoc at The University of British Columbia – [UBC](#) (2 months):** Research on local differential privacy auditing.
Laboratory: [SYSTOPIA](#).
Hosted by Profs. [Mathias Lécuyer](#) and [Sébastien Gambs](#).

Jan 2022	Visiting Ph.D. Student at Universidade Federal de Minas Gerais – UFMG (3 weeks): Investigation and development of data-driven solutions based on machine learning for applications in medicine. Laboratory: EEFFTO / HRTN . Hosted by Prof. Ligia de Loiola Cisneros .
Nov 2021	Visiting Ph.D. Student at Université du Québec à Montréal – UQAM (1 month): Investigation of privacy threats on local differential privacy mechanisms. ★ Funding: EIPHI Graduate School (Ph.D. Student Mobility Grant). Laboratory: LATECE . Hosted by Prof. Sébastien Gambs .

Academic Community Service

Program Committee

2023	10th IEEE Swiss Conference on Data Science (SDS 2023).
2022	European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML/PKDD 2022).
2022	International Conference on Software Engineering Advances (ICSEA 2022).

Reviewer

2023	Information Sciences, Applied Soft Computing.
2022	Expert Systems with Applications, Information Sciences, MDPI Modelling, IEEE Access, IEEE Transactions on Information Forensics and Security, Privacy Enhancing Technologies Symposium (PETS 2023), PPAI-23 Workshop.
2021	Privacy Enhancing Technologies Symposium (PETS 2022).
2020	Security and Communication Networks.

Conference/Workshop Organization

2023	13th Atelier sur la Protection de la Vie Privée (APVP) at UBFC .
2022	1st Comète Workshop on Ethical AI at Inria Saclay , LIX .
2017	II Semana da Animação, Modelagem e Automação at UNEMAT .
2014	I Semana da Faculdade de Ciencias Exatas at UNEMAT .

Volunteer

2013-2016	Study Group Leader of the FOCCO program at UNEMAT (★ Scholarship holder).
2016	Co-Founder of the Consulting Junior Enterprise Energy .
2014	Tutor on Differential and Integral Calculus at UNEMAT .

Participation in Research Projects

ELSA	Title: European Lighthouse on Secure and Safe AI (2022 – 2025). Program: HORIZON Action Grant Budget-Based. Partners: 26 European institutions (e.g., Inria, CISP, NVIDIA Switzerland, EPFL). Role: Project member.
CRYPTECS	Title: Cloud-Ready Privacy-Preserving Technologies (2021 – 2024). Program: ANR-BMBF French-German Joint Call on Cybersecurity. Partners: France (Inria, Zama, and Orange) and Germany (The Bosch Group, University of Stuttgart, and Edgeless Systems). Role: Project member.

Software Development

Python Core contributor and maintainer of [multi-freq-ldpy](#), a Python package for multiple frequency estimation under local differential privacy. MIT License, [GitHub](#).

Publications: The superscript * indicates equal contributions to the paper.

Summary: ➤ 8 Journal Articles ➤ 10 International Conference Papers
➤ 6 National Conference Papers ➤ 1 Preprint / Submitted paper

Journal Articles: Classified according to four JCR ([SCImago Journal Rank](#)) quartiles (Q1, Q2, Q3, and Q4) and its Impact Factor (IF), *retrieved in the year of publication*.

Total	Q1	Q2	Q3	Q4	Unranked
8	5	1	0	1	1

- 2022 **Improving the Utility of Locally Differentially Private Protocols for Longitudinal and Multidimensional Frequency Estimates.**
[Arcolezi, H. H.](#); Couchot, J.-F.; Al Bouna, B.; Xiao, X.
Digital Communications and Networks, Early Access. JCR: **Q1**, IF: **6.348**.
<https://doi.org/10.1016/j.dcan.2022.07.003>
- 2022 **Privacy-Preserving Prediction of Victim's Mortality and Their Need for Transportation to Health Facilities.**
*[Arcolezi, H. H.](#); *Cerna, S.; Couchot, J.-F.; Guyeux, C.; Makhoul, A.
IEEE Transactions on Industrial Informatics, vol. 18(8), p.5592-5599. JCR: **Q1**, IF: **11.648**.
<https://doi.org/10.1109/tii.2021.3123588>
- 2022 **Differentially Private Multivariate Time Series Forecasting of Aggregated Human Mobility With Deep Learning: Input or Gradient Perturbation?**
[Arcolezi, H. H.](#); Couchot, J.-F.; Renaud, D.; Al Bouna, B.; Xiao, X.
Neural Computing and Applications, vol. 34(16), 13355–13369. JCR: **Q2**, IF: **5.102**.
<https://doi.org/10.1007/s00521-022-07393-0>
- 2021 **Machine learning-based forecasting of firemen ambulances' turnaround time in hospitals, considering the COVID-19 impact.**
Cerna, S.; [Arcolezi, H. H.](#); Guyeux, C.; Royer-Fey, G.; Chevallier, C.
Applied Soft Computing, vol. 109, p.107561. JCR: **Q1**, IF: **6.725**.
<https://doi.org/10.1016/j.asoc.2021.107561>
- 2021 **RISE Controller Tuning and System Identification Through Machine Learning for Human Lower Limb Rehabilitation via Neuromuscular Electrical Stimulation.**
[Arcolezi, H. H.](#); Nunes, W. R. B. M.; de Araujo, R. A.; Cerna, S.; Sanches, M. A. A.; Teixeira, M. C. M.; de Carvalho, A. A.
Eng. Applications of Artificial Intelligence, vol. 102, p.104294. JCR: **Q1**, IF: **6.212**.
<https://doi.org/10.1016/j.engappai.2021.104294>
- 2021 **Preserving Geo-Indistinguishability of the Emergency Scene to Predict Ambulance Response Time.**
[Arcolezi, H. H.](#); Cerna, S.; Guyeux, C.; Couchot, J.-F.
Mathematical and Computational Applications, vol. 26(3), p.56. JCR: –, IF: –.
<https://doi.org/10.3390/mca26030056>

- 2020 **Forecasting the Number of Firefighter Interventions per Region with Local-Differential-Privacy-Based Data.**
 Arcolezi, H. H.; Couchot, J.-F.; Cerna, S.; Guyeux, C.; Royer, G.; Al Bouna, B.; Xiao, X.
 Computers & Security, vol. 96, p.101888. JCR: **Q1**, IF: **3.579**.
<https://doi.org/10.1016/j.cose.2020.101888>
- 2020 **Identifying the knee joint angular position under neuromuscular electrical stimulation via long short-term memory neural networks.**
 Arcolezi, H. H.; Nunes, W. R. B. M.; Cerna, S.; de Araujo, R. A.; Sanches, M. A. A.; Teixeira, M. C. M.; de Carvalho, A. A.
 Research on Biomedical Engineering, vol. 36(4), p.511-526. JCR: **Q4**, IF: —.
<https://doi.org/10.1007/s42600-020-00089-1>

International Conference Papers: Classified according to four 2021 [CORE](#) rankings (A*, A, B, and C).

Total	A*	A	B	C	Unranked
10	1	3	1	3	2

- 2023 **On the Risks of Collecting Multidimensional Data Under Local Differential Privacy.**
 Arcolezi, H. H.; Gambs, S.; Couchot, J.-F.; Palamidessi, C.
 International Conference on Very Large Data Bases (**VLDB**). **CORE: A***.
<https://arxiv.org/abs/2209.01684> (published version to appear)
- 2023 **Frequency Estimation of Evolving Data Under Local Differential Privacy.**
 Arcolezi, H. H.; Pinzón, C.; Palamidessi, C.; Gambs, S.
 International Conference on Extending Database Technology (**EDBT**). **CORE: A**.
<https://arxiv.org/abs/2210.00262> (published version to appear)
- 2022 **(Poster) Multi-Freq-LDPy: Multiple Frequency Estimation Under Local Differential Privacy in Python.**
 Arcolezi, H. H.; Couchot, J.-F.; Gambs, S.; Palamidessi, C.; Zolfaghari, M.
 European Symposium on Research in Computer Security (**ESORICS**). **CORE: A**.
https://doi.org/10.1007/978-3-031-17143-7_40
- 2021 **Random Sampling Plus Fake Data: Multidimensional Frequency Estimates With Local Differential Privacy.**
 Arcolezi, H. H.; Couchot, J.-F.; Al Bouna, B.; Xiao, X.
 International Conference on Information and Knowledge Management (**CIKM**). **CORE: A**.
 Acceptance rate: 21.7%.
 ★ SIGIR Student Travel Grant (covered registration fees – virtual attendance).
<https://doi.org/10.1145/3459637.3482467>
- 2020 **Mobility modeling through mobile data: generating an optimized and open dataset respecting privacy.**
 Arcolezi, H. H.; Couchot, J.-F.; Baala, O.; Contet, J.-M.; Al Bouna, B.; Xiao, X.
 International Wireless Communications and Mobile Computing (**IWCMC**). **CORE: B**.
 Acceptance rate: 38%.
<https://doi.org/10.1109/iwcmc48107.2020.9148138>
- 2020 **A Comparison of LSTM and XGBoost for Predicting Firemen Interventions.**
 Cerna, S.; Guyeux, C.; Arcolezi, H. H.; Couturier, R.; Royer, G.
 World Conference on Information Systems and Technologies (**WorldCIST**). **CORE: C**.
https://doi.org/10.1007/978-3-030-45691-7_39
- 2020 **Longitudinal Collection and Analysis of Mobile Phone Data with Local Differential Privacy.**
 Arcolezi, H. H.; Couchot, J.-F.; Al Bouna, B.; Xiao, X.
 IFIP International Summer School on Privacy and Identity Management. **CORE: —**.

- 2020 **Boosting Methods for Predicting Firemen Interventions.**
Cerna, S.; Guyeux, C.; Arcolezi, H. H.; Couturier, R.; Royer, G.
International Conference on Information and Communication Systems (ICICS). CORE: —.
<https://doi.org/10.1109/icics49469.2020.239488>
- 2019 **Long Short-Term Memory for Predicting Firemen Interventions.**
Ñahuis, S. L. C.; Guyeux, C.; Arcolezi, H. H.; Couturier, R.; Royer, G.; Lotufo, A. D. P.
International Conf. on Control, Decision and Information Technologies (CoDIT). CORE: C.
<https://doi.org/10.1109/codit.2019.8820671>
- 2019 **A RISE-based Controller Fine-tuned by an Improved Genetic Algorithm for Human Lower Limb Rehabilitation via Neuromuscular Electrical Stimulation.**
Arcolezi, H. H.; Nunes, W. R. B. M.; Nahuis, S. L. C.; Sanches, M. A. A.; Teixeira, M. C. M.; de Carvalho, A. A.
International Conf. on Control, Decision and Information Technologies (CoDIT). CORE: C.
<https://doi.org/10.1109/codit.2019.8820357>

National Conference Papers.

- 2021 **Machine Learning Algorithms to Predict In-Hospital Mortality in Patients with Diabetic Foot Ulceration.**
Cisneros, L. L.; Arcolezi, H. H.; Cerna, S.; Brandão, J.L.; Santos, G.C.; Navarro, T.P.; Carvalho, A.A.
Congresso da Sociedade Brasileira de Diabetes (SBD).
https://www.aem-sbem.com/wp-content/uploads/2022/03/25298_Supl.-65_04_ABEM_SBD_2021.pdf
- 2020 **Prévisions géographiques du nombre d'interventions des pompiers respectant la confidentialité différentielle locale.**
Arcolezi, H. H.; Couchot, J.-F.; Cerna, S.; Guyeux, C.; Royer, G.; Al Bouna, B.; Xiao, X.
Conférence Nationale sur les Applications Pratiques de l'Intelligence Artificielle (APIA).
http://pfia2020.fr/wp-content/uploads/2020/08/Actes_CH_PFIA2020_V3.pdf
- 2019 **On the Ability to Identify the Knee Joint Position Under Neuromuscular Electrical Stimulation Using Long Short-Term Memory Neural Networks.**
Arcolezi, H. H.; Nunes, W. R. B. M.; de Araujo, R. A.; Cerna, S.; Sanches, M. A. A.; Teixeira, M. C. M.; de Carvalho, A. A.
Conferência Brasileira de Dinâmica, Controle e Aplicações (DINCON).
<http://soac.eesc.usp.br/index.php/dincon/xivdincon/paper/view/1685/1153>
- 2019 **A Robust and Intelligent RISE-based Control for Human Lower Limb Tracking via Neuromuscular Electrical Stimulation.**
Arcolezi, H. H.; Nunes, W. R. B. M.; de Araujo, R. A.; Cerna, S.; Sanches, M. A. A.; Teixeira, M. C. M.; de Carvalho, A. A.
Conferência Brasileira de Dinâmica, Controle e Aplicações (DINCON).
<http://soac.eesc.usp.br/index.php/dincon/xivdincon/paper/view/1683/1152>
- 2017 **Um Estudo Complementar do Controle PID Servo e Regulador Aplicado ao Sistema Pêndulo Invertido.**
Arcolezi, H. H.; Quirino, R. B.
Congresso Brasileiro de Educação em Engenharia (COBENGE).
http://www.abenge.org.br/sis_artigos.php
- 2017 **Um Estudo Complementar ao Projeto de Controle PID do Pêndulo Invertido.**
Arcolezi, H. H.; Quirino, R. B.
Congresso Nacional de Pesquisa e Ensino em Ciências (CONAPESC).
<https://editorarealize.com.br/artigo/visualizar/28867>

Preprints / Submitted Papers.

- 2022 **Machine learning-based prediction of revascularization, amputation, and mortality for in-hospital diabetic foot patients.**
Cisneros, L. L.; Cerna, S.; [Arcolezi, H. H.](#); Furtado, M.; Ferreira, H. B.; Navarro, T. P.; Chiavegatto Filho, A.; de Carvalho, A. A.
Submitted to: Diabetes & Metabolic Syndrome: Clinical Research & Reviews.

Co-Supervision

- 2022 – TBD **[Karima Makhlouf](#):** Ph.D. Student at [Comète team](#) – [Inria](#), [LIX](#).
Main Supervisor: [Catuscia Palamidessi](#) – 50%.
Percentage: 50%.
- 2022 **[Majid Zolfaghari](#):** Long-term visitor (1 year) in the [Comète team](#) – [Inria](#), [LIX](#), Ph.D. Student from the [Sharif University of Technology \(SUT\)](#).
Main Supervisor (at SUT): Rasool Jalili.
Main Supervisor (at LIX): [Catuscia Palamidessi](#) – 50%.
Percentage: 50%.

Teaching Experience

- 2022 **Teaching Assistant on Introduction to Computer Science with Java at [École Polytechnique](#) (40 hours):** Assist students enrolled in the discipline and evaluate students' tests.
- 2021 **Lecturer at Workshop on Privacy for IoT at [Master IoT UBFC](#) (20 hours):** Theory and practical methods of anonymization for 12 students of Master 1.
- 2020 **Lecturer at Workshop on Privacy for IoT at [Master IoT UBFC](#) (20 hours):** Theory and practical methods of anonymization for 21 students of Master 2.

Tutorials, Invited Talks, Presentations, and Media Interviews

- Oct 2022 **Seminar talk:** Locally differentially private protocols for frequency estimation of longitudinal data. In: **Groupe de travail Protection de la Vie Privée ([GT-PVP](#))**. Online.
- Oct 2022 **Tutorial:** A Brief Introduction to Local Differential Privacy. In: **The University of British Columbia ([SYSTOPIA Lab](#))**. In-person.
- Jun 2022 **Oral presentation:** (*Published Paper*) Random Sampling Plus Fake Data: Multidimensional Frequency Estimates With Local Differential Privacy. In: **[APVP 2022](#) - 12th Atelier sur la Protection de la Vie Privée**. In-person.
- Jun 2022 **Oral presentation:** (*Tutorial*) Multi-Freq-LDPy: Multiple Frequency Estimation Under Local Differential Privacy in Python. In: **[APVP 2022](#) - 12th Atelier sur la Protection de la Vie Privée**. In-person.
- Jan 2022 **Invited talk:** Data anonymization and Artificial Intelligence Models (in Portuguese). In: **Hospital Risoleta Tolentino Neves**. Hybrid format (in-person and online). [Media cover](#).
- Nov 2021 **Invited talk:** Improving Utility and Privacy in Multidimensional Frequency Estimates Under Local Differential Privacy. In: **Université du Québec à Montréal ([LATECE Seminar](#))**. Hybrid format (in-person and online).
- Jul 2021 **Invited talk:** Introduction to Privacy Preservation and Machine Learning Techniques in Healthcare (in Portuguese). In: **Universidade Federal de Minas Gerais**. Online.
- Jun 2021 **Oral presentation:** Privacy-Preserving Human Mobility Analytics Through Mobile Phone Data. In: **[APVP 2021](#) - 11th Atelier sur la Protection de la Vie Privée**. Online.

Nov 2020

Media cover: [Mesure Informatique de Ruptures de Service](#). **In: En Direct** (Université de Franche-Comté).

Languages

Portuguese	Native language
English	Full professional proficiency
French	Professional working proficiency
Spanish	Professional working proficiency