

# Jair Wuilloud

Swiss, French and Brazilian nationalities

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## SKILLS

### PROGRAMMING

Julia (4/5)  
Python (4/5)  
C++ (3/5)  
Bash (3/5)  
Clojure/script (2/5)  
JavaScript, HTML, and CSS (2/5)  
Scala/Spark (2/5)  
R (2/5)

### MACHINE LEARNING

HD Computing (5/5)  
Chatbots (4/5)  
Natural Language Processing (4/5)  
GPS Processing (4/5)  
Neural Networks (3/5)  
Reinforcement Learning (3/5)  
Optimization (2/5)

### TECHNOLOGIES

Git and Github (4/5)  
AWS/LINODE/AZURE (3/5)  
websocket/http (3/5)  
Docker (3/5)

## EDUCATION

### POSTDOC

**THEORETICAL PARTICLE PHYSICS**  
2009-2011, ITP, Bern, Switzerland  
**PHD**

**THEORETICAL PARTICLE PHYSICS**  
2006-2010, University of Münster,  
Germany

### MASTER

**MATHEMATICAL PHYSICS**  
2006, Geneva, Switzerland

## LANGUAGES

French (5/5), English (4/5), German (4/5),  
Italian (4/5), Portuguese (1/5)

## LINKS

Github: [gilgameshjw](#)  
LinkedIn: [jair wuilloud](#)

## INTERESTS AND WORK

### HIGH DIMENSIONAL COMPUTING

High Dimensional computing is a neuro-inspired technique based on binary vectors used in conjunction with symbolic logic. My work specialises on Sparse Distributed Memories's and their application to real business cases:

- multidimensional/multibrains Chatbot technology learning via "one shot learning"
- semantics sparse vectors (words, taxonomy, ...)
- fast, fuzzy query systems for medical data, GPS's space, Text, ...
- interplay with Neural Networks and Machine Learning: beaten classification scores on semeval2016 and MRDA datasets, integrated semantic SDM's with pytorch-chatbot
- unpublished papers, competitions and conferences
- developing HDComputing.jl, a julia open source module

### COLLABORATIVE SYSTEMS

- built TaxiQ, real time recommender system for black cabs
- built automatised car sharing allocation solver

### STARTUPS

- one of first employees in 3 of the best founded startups in London
- co-founded **Neurotrophic Labs**(USA, 2019-present), **PLEX AI**(GER, 2019-2020) and **TaxiQ**(UK/CH, 2016-2018): competitions, pitches, planning, prototypes and demos, recruited and worked with up to 7 people with low budgets (<10k\$)
- recruiting and mentoring of younger partners

### SOLUTIONS

Examples built from early concepts to MVP:

- at **mediaplayers**, data strategy processing  $0.5 \times 10^9$  behavioural data points/day
- at **guesser**, implemented original financial models
- at **faxi**, automatised car sharing allocation solution that can also produce reports for customers
- with **plex ai**, a novel chatbot solution leveraging HD computing, with online editor/tester and connected to voice via an app on IOS
- with **neutrophic labs**, a frontend capable of evaluating basic correlations from US medicare dataset within a second
- **taxiq**, real-time, collaborative app for London black cabs

### PAST WORK SUMMARY

- Behavioural simulations
- Recommender systems
- Bitcoin trading strategies
- Tweets processing: entity detection, sentiment analysis, ...
- Algorithms: earth mover distance algorithm in clojure, contributed to early cortex library (NNets, clojure), financial pricers, ...
- Financial models implementation and validation

## SCIENTIFIC PRESENTATIONS

- 9.2020 Nice Heidelberg, **IVA, a Chatbot as System of Systems coordinated via Natural Language**
- 7.2015 Clojure Meetup, Berlin(Germany), **Users simulation for an E-commerce**
- 6.2010 Lattice conference, Villasinius (Italy)
- 11.2008 5th Vienna central European seminar on Particle Physics and Quantum Field Theory "Highlights in Computational Quantum Field Theory", Vienna (Austria), talk as supported junior scientist, **Nf=1 QCD**
- 6.2008 Symposium symmetries and phase in the universe, organised by the german Universe excellence cluster, Isee (Germany), poster about **QCD with one number of flavour**
- 3.2008 German Physical Society, Freiburg (Germany), talk at the **cosmology and particles physics** convention
- 5.2006 IDSIA , Lugano (Switzerland), **quantum models on the circle and the sphere**

## SCIENTIFIC AND COMMERCIAL PUBLICATIONS

- J. Wuilloud, J. Martinez, **High Dimensional Computing for Public Safety**, heroX Public Safety challenge
- J. Wuilloud, **Fast and light fuzzy GPS processing with Coarse Coding**, unpublished
- J. Wuilloud, **Carpooling VS Public Transports: impact on COVID-19 Spread**, faxi(Toyota), 05.2020
- J. Wuilloud, **Superpositions with Sparse Distributed Memories, High Dimensional and Dense Vectors**, unpublished, 03.2019.
- J. Wuilloud, **Superpositions with Sparse Distributed Memories, High Dimensional and Dense Vectors**, unpublished, 03.2019.
- J. Wuilloud, A. Dutra, **System and Method for encoding multiple information sources including human Language**, provisional patent, constellation.ai, 01.2019
- A. Deuzeman, U. Wenger and J. Wuilloud, **Spectral properties of the Wilson Dirac operator in the  $\epsilon$ -regime**, arXiv:1110.4002 [hep-lat], accepted by JHEP.
- J. Wuilloud, G. Bergner , **Acceleration of the Arnoldi method and real eigenvalues of the non-Hermitian Wilson-Dirac operator**, (2011), accepted by Computer Physics Communications, arXiv:1104.1363 [hep-lat].
- K. Demmouche, F. Farchioni, A. Ferling, I. Montvay, G. Munster, E.E. Scholz, J. Wuilloud, **Simulation of 4d N=1 supersymmetric Yang-Mills theory with Symanzik improved gauge action and stout smearing**, to appear in Eur. Phys. J. C (2010), arXiv:1003.2073 [hep-lat]
- K. Demmouche, F. Farchioni, A. Ferling, I. Montvay, G. Munster, E.E. Scholz, J. Wuilloud, **Simulations of supersymmetric Yang-Mills theory**, (2009), arXiv:0911.0595 [hep-lat]
- K. Demmouche, F. Farchioni, A. Ferling, I. Montvay, G. Münster, E. E. Scholz and J. Wuilloud, **Dynamical simulation of lattice 4d N=1 SYM**, PoS Confinement8 (2008) 136, arXiv:0811.1964
- F. Farchioni, I. Montvay, G. Munster, E. E. Scholz, T. Sudmann, J. Wuilloud, **Hadron spectrum of QCD with one quark flavor**, PoS LAT2008 (2008), "arXiv:0810.0161" [hep-lat].
- K. Demmouche, F. Farchioni, A. Ferling, I. Montvay, G. Münster, E.E. Scholz, J. Wuilloud, **Spectrum of 4d N=1 SYM on the lattice with light dynamical Wilson gluinos**, PoS LAT2008 (2008), "arXiv:0810.0144" [hep-lat].
- F. Farchioni, I. Montvay, G. Munster, E. E. Scholz, T. Sudmann and J. Wuilloud, **Hadron masses in QCD with one quark flavour**, Eur. Phys. J. C **52** (2007) 305 "arXiv:0706.1131" [hep-lat].
- F. Farchioni, G. Munster, T. Sudmann, J. Wuilloud, I. Montvay and E. E. Scholz, **Hadron spectrum of QCD with one quark flavor**, PoS LATTICE2007 (2006) 135, "arXiv:0710.4454" [hep-lat].
- T. Boyer, W. Bietenholz and J. Wuilloud, **Spin chain simulations with a meron cluster algorithm**, Int. J. Mod. Phys. C **18** (2007) 1497, arXiv:cond-mat/0701331.