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)
Keras/Pytorch (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

WebPage: **me**
Github: **gilgameshjw**

INTERESTS AND WORK

HIGH DIMENSIONAL COMPUTING
High Dimensional computing is a neuro-inspired technique based on binary vectors used in conjonction 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- unpublished papers, competitions and conferences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 0.5×10^9 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, Irsee (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 ϵ-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`.