

# Antoine Lorient

DATA SCIENTIST, APPLIED MACHINE LEARNING FOR HUMAN AND COMPUTER INTERACTION

3 rue de la Croix Faubin, 75011 Paris

☎ (+33) 7-66-73-95-93 | ✉ antoine.lorient@gmail.com | 📱 toinsson | 🌐 antoinelorient

## Research

### CNRS - IRCAM - INRIA

Paris, France

POST-DOCTORAL RESEARCHER

Jan. 2020 - Sept. 2022 (2.5 years)

- Studied the perception of motor learning in tasks involving complex and creative movements by implementing a metric learning approach on top of Dynamical Time Warping (Pytorch) - published in *PLOS One*.
- Improved upon and released an open-source project on Github and Pypi providing the soft-DTW algorithm for CUDA devices (Pytorch, CUDA) now downloaded more than 2k times - available at *pysdtw*.
- Optimised a training schedule for a motor task using reinforcement learning and MABs based on a framework specialised in interactive machine learning (*Marcelle*, Javascript, Python) - submitted to IHM'22.
- Developed a prototype for movement exploration and modelling based on an algorithm performing live incremental clustering of time series (Javascript, MaxMSP, Python, C++) - demoed at NIME'22.

### University of Glasgow

Glasgow, United Kingdom

RESEARCH ASSISTANT AND PHD CANDIDATE

Mar. 2015 - Sep. 2019 (4.5 years)

- Researched *computational methods for the study of novel gestural interactions*:
  - Deployed discriminative models (Keras) to create virtual surfaces from RGB-D sensors - published at *ISS'17*.
  - Optimised gameplay experiences for custom game controllers using user probabilistic modelling - available on *arXiv*.
  - Explored and characterised user physical capabilities with audio-based reinforcement learning.
  - Created a synthetic dataset for detecting repetitive movement from accelerometer data (Python, Keras).
- Contributed to the European project MoreGrasp:
  - Led redaction of deliverable documents involving coordination with several project members.
  - Implemented visual feedback mechanisms on smartwatches (Android).
  - Prepared live demos and posters for review meetings.
  - Established contacts with health practitioners at Glasgow's hospital leading to workshops and a funding proposal.
- Analysed visualisation techniques (*Jupyter notebooks*) for low-dimensional embeddings, i.e. t-SNE.
- Tutored the courses Artificial Intelligence and Data Fundamentals for Undergraduate and Master students.
- Developed and released open source software for Intel Realsense camera. This package was recommended by Intel as a primary choice for community maintained Python bindings (until librealsense 2.0 was released) and has accrued over one hundred stars on github and 45k downloads to this day - available at *pyrealsense*.

### Stockholm University, Mobile Life

Stockholm, Sweden

RESEARCH ASSISTANT

Feb. 2014 - Oct. 2014 (9 months)

- Explored innovative designs for always-on in the background speech interactions - published at *CHI'15*. Ran an experiment capturing day-long recordings of participants' everyday life followed by qualitative analysis and design workshop with trained Interaction designers.

## Industry

### Now & Net

Paris, France

FOUNDER

2013 - 2015 (2 years)

- Co-founded a startup providing a collective musical experience organised around DJ-ing.
- Developed a proof-of-concept recommender system (Neo4j) for creating attractive playlists.
- Wrote R&D plans leading to the successful application to the status of JEI.

### Ericsson AB

Stockholm, Beijing, Seattle

MULTIPLE POSITIONS

2008 - 2013 (6 years)

- SCRUM master and Software Developer [2013/2014]: Acted as the "guardian of the process" to facilitate daily operations of a cross functional team (8 people). Animated planning meetings, daily follow-up meetings and retrospective meetings.
- System engineer AT&T laboratory [summer 2012]: Integrated features into the customer network with laboratory and in-the-field experiments.
- Research engineer at Ericsson Research [2012]: Prepared the 4G+ prototype for the Mobile World Congress.
- Software Developer 4G/LTE [2008/2011]: Developed algorithms (embedded C) from standard 3GPP specifications. Extended and supported an Erlang test framework used by 50 engineers. Provided training sessions in Stockholm and Beijing.

## Education

**University of Glasgow**

PHD IN COMPUTING SCIENCE

Thesis title: A Computational Approach to Gestural Interactions of the Upper Limb on Planar Surfaces.

*Glasgow, United Kingdom**grad. 2019***Royal Institute of Technology (KTH)**

MSc IN APPLIED PHYSICS

*Stockholm, Sweden**grad. 2009***Telecom Physique Strasbourg**

MSc IN ENGINEERING AND PHYSICS

*Illkirch-Graffenstaden, France**grad. 2008*

## Skills

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<b>Programming</b>	Python, C, embedded C, C++, Erlang, Javascript, $\LaTeX$ , bash, make, git, GitHub, Docker
<b>Data Modelling</b>	Python, Pytorch, Keras, Cuda, MIFlow, Pyro, Seaborn, Jupyter
<b>Applied Research</b>	Scientific Writing and Review, Quantitative Analysis, Experiment Design, Ethics
<b>Soft skills</b>	Lean, Agile, Scrum Master, Teaching, Tutoring, English, French (native), Swedish