

Personal information

Surname / First name

Address

Personal Email

Nationality

Age

Last Update

Web page

PASSERAT-PALMBACH Jonathan

Imperial College London - Department of Computing,
180 Queens' Gate, London SW7 2RH, UK

j.passerat-palmbach@imperial.ac.uk

French

32 years old

23-dec-2019

<https://jopasser.at>

Current Position

Since 2018

Research Scientist at ConsenSys, London, United Kingdom

*I am part of the **ConsenSys Health** team where we focus on privacy preserving machine learning and decentralisation. I'm exploring the potential of bringing together techniques such as Federated Learning and Blockchains to build a new generation of healthcare systems.*

Research Topics

Verifiable Computing (Trusted Execution Environments - TEEs, Zero-Knowledge Proofs)

Secure Computing

Federated Learning

Other affiliations

Since 2014

Research Topics

Research Associate at Imperial College, London, United Kingdom

Decentralised computing

AutoML

Privacy-Preserving Machine Learning

Since 2018

Scientific advisor at Donaco Ltd

Donaco is a startup that aims to facilitate online donations. It dynamically embeds a widget in news media articles that recommends relevant charities to the reader and offers a seamless donation experience.

Activities

My role is to guide the technical design of the product and steer the research directions of the company. Donaco uses a **contextual recommendation pipeline based on NLP techniques** to suggest relevant content and actions in a web widget.

Education

2010-2013

Title

PhD in Computer Science

Contributions to Parallel Stochastic Simulation: Application of Good Software Engineering Practices to the Distribution of Pseudorandom Streams in Hybrid Monte-Carlo Simulations

Defended on October, 11th 2013

Engineering Doctoral School, Blaise Pascal University, Clermont-Ferrand, France

Research laboratory

CNRS - UMR 6158 LIMOS

Advisor

Prof. David R.C. Hill

2007-2010

Computer Science Engineering Degree at ISIMA (Institut Supérieur d'Informatique, de Modélisation et de leurs Applications) College

With Honours

University

Blaise Pascal University, Clermont-Ferrand, France

Awards

Best Paper Award
Best Scientific Contribution

European Simulation and Modeling (ESM) Conference 2011, Guimares, Portugal
Yearly Seminar of the Engineering Doctoral School, Blaise Pascal University, Clermont-Ferrand, France

Grants

iEx.ec DApp challenge

Received \$20,000 to support the integration of the **iEx.ec computing resources market place** in the OpenMOLE scientific platform

AWS Research grants

Support the distribution of large scale connectomics experiments using the Human Connectome Project dataset

Conference organisation

2016-

BACON: Workshop on Brain Analysis using COnnectivity Networks, satellite event of **MICCAI**

2016

Big Data in Medical Imaging, special session of **ISBI**

2015

Symposium on Big Data Initiatives for Connectomics Research, satellite event of the International conference on **Brain Informatics and Health**

Teaching and Scientific Seminars

Teaching

2016

Functional programming in Haskell

10h

1st YEAR COMPUTING UNDERGRADUATE, IMPERIAL COLLEGE LONDON

2016

Introduction to Java

10h

1st YEAR COMPUTING UNDERGRADUATE, IMPERIAL COLLEGE LONDON

2010-2013

EGI Computing Grid labs

10h

3rd YEAR ISIMA (COMPUTER SCIENCE ENGINEERING SCHOOL)

2010-2013

High Performance Computing course

4h

MRES IN COMPUTER SCIENCE, BLAISE PASCAL UNIVERSITY

2012-2013

GPU Computing course

16h

3rd YEAR ISIMA (COMPUTER SCIENCE ENGINEERING SCHOOL)

2010-2013

C++ labs

16h + 16h

2nd & 3rd YEAR ISIMA (COMPUTER SCIENCE ENGINEERING SCHOOL)

2010-2011

Java course

22h

2nd YEAR ISIMA (COMPUTER SCIENCE ENGINEERING SCHOOL)

2010-2011

Software Engineering

16h

1st YEAR BSC IN COMPUTER SCIENCE, BLAISE PASCAL UNIVERSITY

2010-13

UML tutorials

8h

2nd YEAR ISIMA (COMPUTER SCIENCE ENGINEERING SCHOOL)

Recent Supervision

2019

AutoML - Hyperparameter tuning and Neural Architecture Search, Cristian Matache and Maurizio Zen (MEng Computer Science, Imperial College London, UK)

2018

Federated machine learning on medical data using blockchain technology, Théo Ryffel (MSc student in Computer Science, Imperial College London, UK / École Polytechnique, France)

2018

Off-chain computing: decentralized computing off the Ethereum blockchain, Karow Maruf (MEng student in Computer Science, Imperial College London, UK)

2016 **Executing software containers in HPC environments: application to Docker containers in the OpenMOLE workflow engine**, Vincent Hage (MSc student in Computer Science, Imperial College London, UK / École des Mines de St-Étienne, France)

Scientific Tutorials

2015 **Model Exploration Using OpenMOLE - a workflow engine for large scale distributed design of experiments and parameter tuning**, Tutorial at the IEEE High Performance Computing and Simulation Conference, Amsterdam, the Netherlands

2012 **How to Correctly Deal With Pseudorandom Numbers in Manycore Environments - Application to GPU programming with Shoverand**, Tutorial at the IEEE High Performance Computing and Simulation Conference, Madrid, Spain

Scientific Talks

2019 **Convergence of Blockchain and Secure Computing for Healthcare solutions**, EU Blockchain forum, Frankfurt, Germany

2017 **Building an ecosystem of functional libraries for the OpenMOLE scientific platform: from batch jobs to automatic model parameter tuning**, ScalaX bytes, London, UK

2016 **GridScale: a Journey from Object-Oriented to (More) Functional Programming**, Scala eXchange, London, UK

2014 **Invited lecture on software engineering**, University of Pardubice, Czech Republic

2013 **How to Correctly Handle Pseudorandom Numbers on GPU Using Shoverand**, NVIDIA's GPU Technology Conference, San Jose, California, USA

Skills

Languages

English (fluent), French (mother tongue)

Computer Science

Programming Languages

C, C++, Java, CUDA, Scala, Bash, Python, Solidity

Software Engineering Tools

Git, CMake, Maven, Valgrind, GDB, Puppet, Salt, SBT

Operating System

GNU Linux (Debian/Ubuntu)

Job Schedulers

EMI, PBS/Torque, Slurm

Distributed Filesystems

Ceph, GlusterFS

Web3

Ethereum, iExec, **Hyperledger Avalon**, IPFS

Cryptography

Intel SGX, ZKSnarks, Multi-Party Computation

Sport

Karate

Distinguished athlete (national and international medallist)

Member of the England National A Squad

Black Belt (4th dan)

Professional instructor degree

Selected Publications

Complete list available at
[https://orcid.org/
0000-0003-3178-9502/print](https://orcid.org/0000-0003-3178-9502/print)

- [1] Jonathan Passerat-Palmbach, Romain Reuillon, Mathieu Leclaire, Antonios Makropoulos, Emma C. Robinson, Sarah Parisot, and Daniel Rueckert. Reproducible large-scale neuroimaging studies with the openmole workflow management system. *Frontiers in Neuroinformatics*, 11:21, 2017.
- [2] Sarah Parisot, Salim Arslan, Jonathan Passerat-Palmbach, William M. Wells III, and Daniel Rueckert. Group-wise parcellation of the cortex through multi-scale spectral clustering. *NeuroImage*, 136:68 – 83, 2016.
- [3] Jonathan Passerat-Palmbach, Jonathan Caux, Pierre Schweitzer, Pridi Siregar, Claude Mazel, and David R. C. Hill. Harnessing aspect oriented programming on GPU: application to warp-level parallelism (WLP). *The International Journal of Computer Aided Engineering and Technology*, 7:158–175, 2015.
- [4] Jonathan Passerat-Palmbach, Claude Mazel, and David R. C. Hill. TaskLocalRandom: a statistically sound substitute to pseudorandom number generation in parallel java tasks frameworks. *Concurrency and Computation: Practice and Experience*, 2014. doi:/10.1002/cpe.3214.
- [5] Jonathan Passerat-Palmbach and David R. C. Hill. OpenCL: a suitable solution to simplify and unify high performance computing developments. In *Patterns for Parallel Programming on GPUs*, pages 189–209. Saxe-Coburg Publications, Stirlingshire, Scotland, frederic magoules edition, 2013. to be published in GPU Design Patterns (ISSN 1759-3158).

- [6] Jonathan Passerat-Palmbach, Tyler Farnan, Robert Miller, Marielle S. Gross, Heather Leigh Flannery, and Bill Gleim.
A blockchain-orchestrated Federated Learning architecture for healthcare consortia. 2019.
arXiv: 1910.12603 [cs.CY].
- [7] Theo Ryffel, Andrew Trask, Morten Dahl, Bobby Wagner, Jason Mancuso, Daniel Rueckert, and Jonathan Passerat-Palmbach.
A generic framework for privacy preserving deep learning.
CoRR, abs/1811.04017, 2018.
- [8] Romain Reuillon, Mathieu Leclaire, and Jonathan Passerat-Palmbach.
Model Exploration Using OpenMOLE - a workflow engine for large scale distributed design of experiments and parameter tuning.
In *IEEE High Performance Computing and Simulation conference 2015*, pages 1–8, Amsterdam, Netherlands, jun 2015. IEEE.
- [9] Lisa M Koch, Martin Rajchl, Tong Tong, Jonathan Passerat-Palmbach, Paul Aljabar, and Daniel Rueckert.
Multi-atlas segmentation as a graph labelling problem: Application to partially annotated atlas data.
In *International Conference on Information Processing in Medical Imaging*, pages 221–232. Springer, 2015.
- [10] Sarah Parisot, Salim Arslan, Jonathan Passerat-Palmbach, William M Wells III, and Daniel Rueckert.
Tractography-driven groupwise multi-scale parcellation of the cortex.
In *International Conference on Information Processing in Medical Imaging*, pages 600–612. Springer, 2015.
- [11] Sarah Parisot, Martin Rajchl, Jonathan Passerat-Palmbach, and Daniel Rueckert.
A continuous flow-maximisation approach to connectivity-driven cortical parcellation.
In *International Conference on Medical Image Computing and Computer-Assisted Intervention*, pages 165–172. Springer, 2015.
- [12] Romain Reuillon, Mathieu Leclaire, and Jonathan Passerat-Palmbach.
Model exploration using openmole - a workflow engine for large scale distributed design of experiments and parameter tuning.
In *Proceedings of the IEEE High Performance Computing and Simulation conference*, pages 1–8, 2015.
- [13] Jonathan Passerat-Palmbach, Mathieu Leclaire, Romain Reuillon, Zehan Wang, and Daniel Rueckert.
OpenMOLE: a Workflow Engine for Distributed Medical Image Analysis.
In *International Workshop on High Performance Computing for Biomedical Image Analysis (part of MICCAI 2014)*, Boston, United States, September 2014.