# Été Rémi

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Driving licence A and B


## Software development - PhD in High Energy Physics

## Technical skills

- ✔ Analysis and synthesis on a research topic
- ✔ Prototyping new scientific technologies
- ✔ Ability in giving talks during international conferences
- ✔ Ability in reporting weekly progress
- ✔ Ability in communicating with pedagogy

## Computing skills

- ✔ Development: C/C++ 11/14/17, Python
- ✔ Versionning: Git, SVN
- ✔ Script: XML, JSON, CMake, Shell UNIX
- ✔ Web: Javascript, HTML, CSS, Node.js
- ✔ Design: Design patterns, framework refactoring
- ✔ Software and libraries: Qt, OpenMP, Geant4, ROOT, iLCSoft
- ✔ Technologies: TravisCI, Docker, CVMFS

## Experiences and projects

March 2021 – Today
Design engineer

**2S-Computing** – Client: Dassault aviation

Avionic test bed software development
- Software architecture design
- Software development and unit testing
- v1 prototyping and demonstrator
- Graphical User Interface design and development

C/C++ 11/14/17, Shell, XML, Json, CMake, Qt, Doxygen, Git, Docker

July 2017 – March 2021
Fellowship

**DESY** – Deutsches Elektronen Synchrotron
Fellowship program – FLC group

- ILD software reconstruction convener
- iLCSoft stack development and adminstration
  - Development of an automated energy calibration method (LCCalibration)
  - Development of core packages (Marlin, LCIO)
  - Software stack admin
  - Software deployment
  - Data quality insurance
  - Software support: software issues, tutorial sessions
- Development of multi-threaded version of the Marlin framework
  - Development of a thread-safe IO library (SIO)
  - Development of a thread-safe logging library (streamlog)
  - Design and implementation of the multi-threading version of Marlin
  - Porting of the ILD reconstruction chain to the multi-threaded framework

C/C++ 11/14/17, Python, ROOT, Shell, XML, Json, CMake, Qt, LaTeX, Beamer, Doxygen, Git, Docker, TravisCI

2013 – 2017
PhD

**IPNL** – Institut de Physique Nucléaire de Lyon
Online data quality monitoring framework development for the high energy physics domain (DQM4HEP)

- Software architecture development
- Software development : network interface, graphical user interfaces (GUI), analysis user interfaces, DAQ interface, remote process managment
- Software validation using real test beam data at CERN (SPS)
- Deployment over multiple servers
- Presented at international conferences :
  - CALICE meeting (Japon, France) ~ 70 pers
  - IEEE Poster session (France)

C/C++, ROOT, Bash, XML, JSON, CMake, pthread, DIM, Qt, LaTeX, Beamer, Doxygen, Git, Yaml, Travis CI

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|---|---|---|
| 2013 – 2017<br>PhD | **IPNL** – Institut de Physique Nucléaire de Lyon<br>Particle flow algorithm development (ArborPFA) in the ILD detector for the ILC project<br>➢ Oriented-tree graph pattern recognition algorithms development in the HEP context<br>➢ Applied in a study meant to separate nearby hadronic showers in the SDHCAL prototype<br>➢ Physics performances study for the ILC project using the ILD detector<br>➢ Presented at international conferences :<br>- CALICE Meeting (Japan, USA, Spain, France, Germany) ~ 70 pers<br>- Linear Collider Workshop (Japan, Canada) ~ 200 pers | C/C++, XML, CMake, Bash, PandoraSDK, OpenMP, ROOT, Geant4<br>LaTeX, Beamer, Git |
| 2013<br>6 months<br>M2 internship | **IPNL** – Institut de Physique nucléaire de Lyon<br>Separation of nearby hadronic shower in the SDHCAL prototype for the ILC project<br>➢ Oriented-tree graph pattern recognition algorithms development for the SDHCAL prototype<br>➢ Algorithm purity and efficiency study using single hadron showers | C/C++, XML, CMake, Bash, ROOT,<br>LaTeX, Beamer, Git |
| 2012<br>3 months<br>M1 internship | **CERN** – Centre Européen pour le Recherche Nucléaire<br>Geant4 simulation of GEM detector for the CMS group of the LHC experiment<br>➢ Numerical simulation implementation<br>➢ Data analysis of simulated samples | C/C++, SVN, CMake, Geant4, Doxygen, ROOT |
| 2011<br>1 month<br>L3 internship | **CERN** – Centre Européen pour le Recherche Nucléaire<br>Refactoring of the ILCDIRAC user interface for the LDC group at CERN<br>➢ Application workflow analysis<br>➢ User interface refactoring and implementation | Python, Bash, XML, Git, SVN, Doxygen |
| 2011<br>1 month<br>L3 internship | **CPPM** – Centre de Physique des Particules de Marseille<br>Set of cut optimisation on B meson selection for the $B_s \rightarrow \mu^+\mu^-$ channel of the LHCb experiment at LHC<br>➢ LHCb data analysis | C/C++, ROOT, LaTeX |

## Education

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|---|---|---|
| 2013 - 2017<br>PhD thesis | **Université Claude Bernard Lyon 1**<br>Particle flow algorithm development (ArborPFA) in the ILD detector for the ILC project. Online data quality monitoring framework development. | C/C++, ROOT, Python, Git, SVN, CMake,XML, Json, CMake, Shell UNIX, Apache, DIM, Qt, Geant4, Doxygen |
| 2011 - 2013<br>Master | **Université Claude Bernard Lyon 1**<br>Subatomic physics and astrophyscics | C/C++, Image processing, Statistical physics, Particle physics |
| 2008 – 2011<br>Licence | **Université Aix Marseille II**<br>Physics licence | C language, Numeric method for physics, Advanced mathematics |

## Complementary education

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|---|---|---|
| 2018 | CERN computing school – Tel-Aviv (Israel) | Processor arch, multi-threading, general software development |
| 2014<br>PhD school | SOS : School Of Statistics – Autrans (France) | Multivariate analysis, neural network, Boosted decision tree |
| 2014<br>PhD school | Subatomic physics school – Lyon (France) | Geant4, high energy physics |
| 2013<br>PhD school | Architectures , tools and methodologies for developping efficient large scale scientific computing applications – Bertinoro (Italia) | C++ 11, OpenMP, GPU programming, Profiling tools |
| 2012<br>Master school | CERN Summer school – Geneva (Switzerland) | Numerical simulation, Geant4, data analysis |

## Scientific notes, proceedings and papers


International Large Detector: Interim Design Report
- arXiv:2003.01116 (2020)

APRIL : a novel Algorithm for Particle Reconstruction at ILC
- arXiv:2002.09678 (2020)

Parallel versions of event processing frameworks
- AIDA-2020-D3.5, http://cds.cern.ch/record/2706479 (2020)

EUDAQ2 - A flexible data acquisition software framework for common test beams
- JINST, 10.1088/1748-0221/14/10/p10033 (2019)

DQM4HEP : A generic data quality monitoring for high energy physics
- EPJ Web of Conferences 214, 05036 (2019)
- V01-04-04, 10.5281/zenodo.1012575 (2017)
- AIDA-2020-MS67, http://cds.cern.ch/record/2291805 (2017)

Tracking within Hadronic Showers in the SDHCAL prototype using Hough Transform Technique
JINST, 10.1088/1748-0221/12/05/p05009 (2017)

Separation of nearby hadronic showers in the CALICE SDHCAL prototype detector using ArborPFA
- CALICE-CAN-2015-001 (2015)

Construction and commissioning of a technological prototype of a high-granularity semi-digital hadronic calorimeter
- JINST. 10. 10.1088/1748-0221/10/10/P10039 (2015)