Ete Rémi

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Driving licence A and B

Computing for High Energy Physics

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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

Since July 2017
Fellowship

DESY – Deutsch 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

2013 – 2017
PhD

IPNL – Institut de Physique Nucléaire de Lyon
Particle flow algorithm development (ArborPFA) in the ILD detector for the ILC project

- Oriented-tree graph pattern recognition algorithms development in the HEP context
- Applied in a study meant to separate nearby hadronic showers in the SDHCAL prototype
- Physics performances study for the ILC project using the ILD detector
- Presented at international conferences :
  - CALICE Meeting (Japan, USA, Spain, France, Germany) ~ 70 pers
  - Linear Collider Workshop (Japan, Canada) ~ 200 pers

C/C++, XML, CMake, Bash, PandoraSDK, OpenMP, ROOT, Geant4 LaTeX, Beamer, Git

2013
6 months
M2 internship

IPNL – Institut de Physique nucléaire de Lyon
Separation of nearby hadronic shower in the SDHCAL prototype for the ILC project

- Oriented-tree graph pattern recognition algorithms development for the SDHCAL prototype
- Algorithm purity and efficiency study using single hadron showers

C/C++, XML, CMake, Bash, ROOT, LaTeX, Beamer, Git

2012 3 months M1 internship	**CERN** – Centre Européen pour le Recherche Nucléaire Geant4 simulation of GEM detector for the CMS group of the LHC experiment ➢ Numerical simulation implementation ➢ Data analysis of simulated samples	C/C++, SVN, CMake, Geant4, Doxygen, ROOT
2011 1 month L3 internship	**CERN** – Centre Européen pour le Recherche Nucléaire Refactoring of the ILCDIRAC user interface for the LDC group at CERN ➢ Application workflow analysis ➢ User interface refactoring and implementation	Python, Bash, XML, Git, SVN, Doxygen
2011 1 month L3 internship	**CPPM** – Centre de Physique des Particules de Marseille Set of cut optimisation on B meson selection for the $B_s \rightarrow \mu^+\mu^-$ channel of the LHCb experiment at LHC ➢ LHCb data analysis	C/C++, ROOT, LaTeX

Education

2013 - 2017 PhD thesis	**Université Claude Bernard Lyon 1** 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 Master	**Université Claude Bernard Lyon 1** Subatomic physics and astrophyscics	C/C++, Image processing, Statistical physics, Particle physics
2008 – 2011 Licence	**Université Aix Marseille II** Physics licence	C language, Numeric method for physics, Advanced mathematics

Complementary education

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

Scientific notes, proceedings and papers

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)