Chiao-Ying Lin CY. Lin
lenjoyn@gmail.com

EDUCATION

PhD, University of Cambridge, UK **01.2016-05.2019**
THESIS: Search for Diboson New Physics and the L1Calo Software Development with the ATLAS detector
SUPERVISOR: Dr. Christopher Lester

Master of Science, National Central University, TW **09.2011-10.2013**
THESIS: : Search for Doubly Charged Higgs Boson in Dimuon and Trimuon channels with CMS detector at $\sqrt{s} = 8\ TeV$
SUPERVISOR: Prof. Chia-Ming, Kuo

EXPERIENCE [selected tasks]

The ATLAS Experiment An experiment to study the fundamental structure of the universe with a collaboration of *approx*3000 people of >90 countries. All the following works are conducted with people from multiple countries.

Simulation Software The simulation is for the background estimation and the modelling of detector response.

- under Gaudi framework: convert C++ functions/classes into python components
- maintained by gitlab with continuous integration tests
- distributed computing with PANDA grid system
- duty: calorimeter trigger simulation[head developer]
  Framework development (C++) [link]
  — Scalable skeleton
  — Computing algorithm (time complexity: $\mathcal{O}(cN)$, N as the number of objects to process per event)
  — Object oriented design
  — Class inheritance
  — building processed by cmake
  — Interface design for extendable I/O API
  Identifier system (C++)
  — Cache system for the detector readout channels
  Database management for simulation system (python)
  — Oracle database
  — Interfaced by sqlite (RESTful API)
  — Format: json, BLOB
  Object reconstruction

Physics Analysis (searches for new particles and new interactions) [1, 6, 7, 9] The analysis is to spot the signal from background-enriched datasets by the kinematic difference and statistical interpretation.

- Tuple-based data structure
- Makefile/cmake building C++
- HTCondor/PANDA grid distributed computing
- Monte Carlo simulation
- duty:
  — data cleaning
  — framework maintenance (enum/bitmask cut-flow tracking)
  — background modelling of huge data
  — data visualization
  — statistical interpretation (Bayesian statistics, profile likelihood, variable correlation)

Hardware Related Experience

Muon Lifetime Measurement with Scintillator Detector

- Logic circuit design & Labview I/O system
- Data analysis with C++

Construction of Multiwire Proportional Chamber

- DAQ electronic system layout (Protel)

AWARDS

Peterhouse Research Studentship [**full funding**] 2015

Academic Excellence Award 2006

TECHNICAL SKILLS

Programing : Bash (Intermediate), visual C (Intermediate), C++ (Advanced), Python (Novice), LaTeX(Advanced)

Machine Learning Algorithms : BDT (Medium), CNN (Novice), RNN (Novice)

Database (Intermediate) : RESTful, COOL (system) BLOB, JSON (format)

Analysis Tools : ROOT (Expert), gnuplot (Advanced), Labview (Novice), TMVA (Intermediate), Statistics (Advanced)

Electronic Software (Intermediate) : Multisim, Protel

Electronic Tools : Nuclear Instrument Module (NIM) (Novice), AD/DA conversion card (Intermediate), fundamental electronics (Intermediate), oscilloscope operation (Advanced)

Languages : English (Advanced), Mandarin (Native), French (Novice)

LEADERSHIP

NCU Science Summer Camp **2007,2008**

Purpose: a summer camp for high school students interested in general science. The one week camp covers a wide range of activities and a series of courses about what "real" physicists do for their researches.
Position: Teaching Coordinator for all the courses
Duty:

- Negotiation with other teams for schedule design
- Arrangement of courses
- Material preparation and budget control
- Guideline for the course design of the teaching team members

ATLAS Trigger Simulation **2017-2019**

Purpose: a new hardware trigger system will be implemented for the ATLAS detector in 2020. The performance was studied by a Monte Carlo simulation to decide the firmware design for implementation.
Position: Manager of the software design
Duty:

- General structure design
- Collecting advices from senior colleagues
- Framework instruction
- Maintenance of the framework and coordination of the new simulation components

COMMUNICATION

Presentation

Internal presentation: >100 times during PhD

Analysis methodology

Statistical Interpretation

Framework design concept

Framework induction

Conference presentation:

International Conference on High Energy Phyiscs (once per two years, > 1200 participants)

International Conference on Supersymmetry and Unification of Fundamental Interactions (once per year >200 participants)

Discussion Who: Collaboration members with varied backgrounds (software structure, hardware design, physics, or database) with different nationalities How: e-mail, or skype What: The demand of framework design, hardware specification for simulation, physics motivation, use of some packages, etc.

PUBLICATIONS & TALKS

As one of the ATLAS members, I am on the author list for more than 130 papers. [source]

Papers

1 ATLAS Collaboration. Search for WW/WZ resonance production in $\ell\nu qq$ final states in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector. *JHEP*, 03:042, 2018 link

2 ATLAS Collaboration. Combination of searches for heavy resonances decaying into bosonic and leptonic final states using 36 fb^{-1} of proton-proton collision data at $\sqrt{s} = 13$TeV with the ATLAS detector. *Phys. Rev. D*, 98:052008, Sep 2018link

3 ATLAS Collaboration. Study of electroweak WW/WZ/ZZ production in the semileptonic final states in association with a high-mass dijet system with 13 TeV ATLAS data . Technical report, 2018 link [draft, ATLAS member only]

Invited Talks

4 ATLAS Collaboration. ATLAS level-1 calorimeter trigger: Phase-I Upgrade Performance link [**ICHEP 2018**]

5 ATLAS Collaboration. Exotic DibosonPhysics in UK. London, Jan 2019 link [**ATLAS UK 2019**]

Conference Notes

6 ATLAS Collaboration. Search for WW/WZ resonance production in $\ell\nu qq$ final states in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector. Number ATLAS-COM-CONF-2017-058, Geneva, Jun 2017 link

7 ATLAS Collaboration. Search for diboson resonance production in the $\ell\nu qq$ final state using pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector at the LHC. Number ATLAS-COM-CONF-2016-055, Geneva, Jul 2016 link

ATLAS Internal Note

8 ATLAS Collaboration. Combined triggers efficiency studies for Run 2 . Technical Report ATL-COM-DAQ-2015-066, CERN, Geneva, May 2015 link [ATLAS member only]

9 ATLAS Collaboration. Search for heavy $WW/WZ/ZZ$ resonances in semi-leptonic final states in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector. Technical Report ATL-COM-PHYS-2018-1549, CERN, Geneva, Oct 2018 link [ATLAS member only]

CONFERENCES

[**Invited**] SUSY2019	05.2019
[**Invited**] ICHEP2018 [4]	07.2018
ATLAS UK [5]	2017, 2018, 2019
CMS Week	09.2013

SUMMER SCHOOLS

UK STFC Summer School for High Energy Physics	09.2016
CMS Data Analysis School	09.2011
CERN Summer School	07.2009-08.2009
Asian Science Camp	08.2007

WORK EXPERIENCE

NCU CMS Grid Manager, Dept. of Physics, NCU, TW **05.2012-09.2013**

- Grid system maintenance
- Assistance on NCU CMS-AMS Grid building

Signaller, Military Service in Ministry of National Defense, TW **06.2010-05.2011**

- Communication equipment operation and maintenance

Dorm Network Manager, Computer Centre, NCU, TW **10.2006-06.2010**

- Internet connection system maintenance
- Solving connection problems