Jiwon Park

Contact Information

Hanyang University
Department of Physics
222, Wangsimni-ro, Seongdong-gu,
Seoul, 04763, Republic of Korea

Phone: +82 (10) 9996-4991
E-mail: jiwon.park@cern.ch
Git: https://github.com/minerva1993

Education

Hanyang University, Seoul, Korea

Ph.D. in Physics **March 2017 ~ Present**

- Works on the CMS experiment
- Interested in particle physics experiment and phenomenology, machine learning, and big data analysis

Hanyang University, Seoul, Korea

B.S. in Physics **March 2013 ~ February 2017**

- Honors: summa cum laude
- Kwanjeong Educational Foundation Scholarship (2015∼2016)

Research Interests

Particle physics experiments, phenomenology, and machine learning
Top quark physics, beyond standard model (BSM), flavor changing neutral current (FCNC) in top quark decay, muon detector (RPC) data quality monitoring, data analysis using deep learning

Research Activities

Hanyang University, Seoul, Korea

Graduate Researcher (Adviser: Prof. Tae Jeong Kim) **December 2016 ~ Present**

- CMS RPC detector DQM expert (2022-present)
- CMS online central DQM shifter (2022)
- Flavor changing neutral current in top quark decay (tHq, H->bb process) (2017-2021)
- Recasting LHC ATLAS SUSY search in di-stau to tau and neutralino channel with MadAnalysis5 (2020)
- Muon L1 trigger development for CMS Phase II upgrade (2019-)
- Phenomenology study for $R(D*)$ anomaly in top quark decay (2019)
- MadGraph5_aMC@NLO commissioning in CMS Physics Generator group (2019)
- Muon isolation study using deep learning (2018)
- Muon RPC Data Manager (Shifter) (2018)
- Recasting LHC CMS exotic (dark matter) search in diphoton channel with MadAnalysis5 (2017)

Undergraduate RA (Adviser: Prof. Jae-hyuk Oh) **April 2014 ~ November 2016**

- Study on phase transition in Einstein-dilaton-U(2) gauge field theory using numerical method

Teaching Experiences

Hanyang University, Seoul, Korea

Advising Undergraduate Thesis

- Search for leptoquark mediated top quark decay at 13 TeV
- Identification of additional b jets in $t\bar{t}b\bar{b}$ process
- Jet assignment of $t\bar{t}$ system in semileptonic decay channel using deep learning
- Search for FCNC in top quark decay using Fast Simulation
- Muon isolation study using deep learning
- Measurement of top pair production cross section with CMS Open Data
- Measurement of Z boson mass using CMS 7 TeV Open Data

Publications

[1] CMS Collaboration, "Search for flavor-changing neutral current interactions of the top quark and the Higgs boson decaying to a bottom quark-antiquark pair at $\sqrt{s}$ =13 TeV", arxiv:2112.09734, JHEP02(2022)169

[2] **J. Park**, et al., "Implementation of the ATLAS-SUSY-2018-04 analysis in the MadAnalysis 5 framework (staus in the di-tau plus missing transverse energy channel; 139 fb^{-1})", 2101.02245, Mod.Phys.Lett.A 36 (2021) 01, 2141009

[3] J. Choi, et al., "Identification of additional jets in the $t\bar{t}b\bar{b}$ events using a deep neural network", arxiv:1910.14535

[4] T. Kim, et al., "Correlation between RD($\star$) and top quark FCNC decays in leptoquark models", arXiv:1812.08484, JHEP 1907 (2019) 025.

[5] **J. Park**, "Search for flavor changing neutral current in top quark and Higgs boson interaction at $\sqrt{s}$ = 13 TeV", PoS ICHEP2018 (2019) 864

[6] B. Fuks, et al., "Proceedings of the first MadAnalysis 5 workshop on LHC recasting in Korea", arXiv:1806.02537.

[7] M. Park, **J. Park**, J. Oh, "Phase transition in anisotropic holographic superfluids with arbitrary dynamical critical exponent z and hyperscaling violation factor α", Eur.Phys.J.C77 (2017) no.11, 810, arXiv:1609.08241.

Oral & Poster Presentations (International conference only)

[1] **J. Park**, "Search for Flavor Changing Neutral Higgs at 13 TeV", ICHEP2018, Seoul, Korea, July 4-11, 2018.

Awards

[1] Best group performance in the CMS Data Analysis School 2019 in Beijing

[2] Best talk in Korea Physical Society Meeting, 17 October, 2017

Skills

Data Analysis
- Experience in big data analysis for high energy physics
- Developing deep learning framework for high energy physics

Analysis Software
- CMS-software, CMS Grid computing
- ROOT and its python bindings such as uproot and root-numpy
- MVA, Machine learning (TMVA, Tensorflow, Keras, scikit-learn)

Physics Simulation
- MadGraph5_aMC@NLO, Pythia8, Delphes3
- MadAnalysis5 for physics result recasting (phenomenology studies)

Programming Languages
- Python, C++, Mathematica
- UNIX shell (Bash) scripting

Computing and Server management
- CentOS 7 + OpenHPC server manager in HYU
- Experiences in CentOS 7, SLC6, and Ubunutu 16-18

Languages

Korean (native), English (conversational)