Minjae Kwon

Curriculum Vitae

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Education

MAR2012-FEB2015 **General Curriculum for Science and Technique**, *Masan-Yongma High School*, Changwon, Republic of Korea.

MAR2015-FEB2019 **Bachelor of Science (B.S.), Physics**, *Pusan National University*, Busan, Republic of Korea.

MAR2019-FEB2022 **Master of Science (M.S.), Physics**, *Pusan National University*, Busan, Republic of Korea.
Thesis Title: Study on reciprocal scattering of low energy alpha source using silicon pixel detector

MAR2022-*present* **Ph.D Course, Physics**, *Pusan National University*, Busan, Republic of Korea.

Major Courses

- Computational Physics
- Electronics For Scientists
- Nuclear Physics

Interests

Engineering & Computation

- Time Critical Programming/Engineering
- Physics Modeling and Simulation
- Ambigious Curve Fitting (Closed, Open Curve)
- Silicon Pixel Detector (SPD)

Secondary Education

- Easily reachable general physics laboratory
- Uncertainty estimation and experiemental statistics for secondary education

Experience

Working

MAY2015–DEC2015 **Teaching and advising designing experiments and data-taking technique with Arduino** , *Masan-Yongma High School*, Changwon, Republic of Korea.
Project Name: Development of Device for Microcomputer-Based Laboratories (MBL) with Arduino (Arduino를 활용한 MBL장비 고안)
Supported by Youth Science Class (YSC) funded by the Korea Foundation for the Advanced of Science & Creativity (KOFAC).

DEC2016–FEB2019 **Undergraduated Internship**, *Heavy Ion Experiment Lab. (HIPEx), Department of Physics, Pusan National University*, Busan, Republic of Korea.

MAR2019–FEB2022 **Researcher : Master Course**, *Heavy Ion Experiment Lab. (HIPEx), Department of Physics, Pusan National University*, Busan, Republic of Korea.

01JUL2019–24AUG2019 **Summer Student**, *CERN*, Meyrin, Switzerland.
CERN Non-Member State Summer Students 2019

MAR2022–*present* **Researcher : Ph.D Course**, *Heavy Ion Experiment Lab. (HIPEx), Department of Physics, Pusan National University*, Busan, Republic of Korea.

MAR2019–present **Teaching Assistant**, *Pusan National University*, Pusan, Republic of Korea.
Teaching Assistant for lecture 'General Physics Laboratory' at Spring Semester of 2019, Spring Semester of 2020 and Spring Semester of 2022

SEP2021–*present* **ALICE-ITS On-call Expert**, *ALICE, CERN*, Meyrin, Switzerland.

SEP2021–*present* **Technical Staff**, *SQM2022(The 20th International Conference on Strangeness in Quark Matter)*, Busan, Republic of Korea.
Webpage Management, Indico Management, Zoom Broadcasting Management.
`https://sqm2022.pusan.ac.kr`, `https://indico.cern.ch/event/1037821/`

Project

MAY2014–DEC2014 **Data Transfer Technique with Arduino via Visible Light**, *Masan-Yongma High School, Republic of Korea*.
Original Title (Korean): Arduino를 활용한 가시광선대역의 전자기파를 이용한 상호 데이터 교환 기술
Supported by Youth Science Class (YSC) funded by the Korea Foundation for the Advanced of Science & Creativity (KOFAC).

FEB2017–MAY2017 **Circumstance Monitoring System Development**, *HIPEx, Department of Physics, Pusan National University*.
System to monitor temperature and humidity was developed with Raspberry Pi,external sensor, and Google Spreadsheet for data storing. Data can be served without local server, just with google spreadsheet. It has been running smoothly in clean room for about 2 years. (since May 2017)

MAY2017–MAY2019 **Mass Chip Test (MCT) and Hybrid Integrated Circuit Assembly (HIC Assembly)**, *HIPEx, Department of Physics, Pusan National University*, Busan, Republic of Korea.
It includes procedures for Mass Chip Test (MCT) and Outer Barrel Hybrid Integrated Circuit Assembly (OB-HIC Assembly).

JUL2019–AUG2019 **Analysis Of Cosmic Ray Data Taken During The Commissioning Of The New ALICE Inner Tracking System**, *ALICE, CERN*, Meyrin, Switzerland.
Supervised by Magnus Mager and Markus Keil, EP-AID-DT, CERN. The Report is uploaded at CERN CDS : `http://cds.cern.ch/record/2687398`

JUN2019–FEB2022 **Study on the 3-body elastic scattering system**, *Pusan National University*, Busan, Republic of Korea.
This project is supported by National Research Foundation of Korea (NRF)

Conferences (Oral Presentation, Poster)

26OCT2017 ***Poster)*** **Temperature and Humidity Monitoring System with Raspberry Pi**, *Contest for Undergraduate at KPS Fall Meeting, Gyeongju, Republic of Korea*.
Original Title (Korean): 라즈베리파이를 이용한 온도 및 습도 모니터링 시스템 구축

11JUN2018 **OB HIC Production - Pusan/Inha**, *11th ALICE ITS upgrade, MFT and O2 Asian Workshop, Hiroshima, Japan*.
`https://indico.cern.ch/event/687364/contributions/3036053`

04NOV2018 **A Report on Korean activities for the ALICE-ITS upgrade**, *The 7th Asian Triangle Heavy-Ion Conference (ATHIC 2018), Hefei, China*.
`https://indico.ihep.ac.cn/event/8180/session/35/contribution/181`

Publication

1. Jongsik Eum, **Minjae Kwon**, Sanghyeon Lee, In-Kwon Yoo, "Feasibility Study on the Total Ionizing Dose Effect of the Alice Pixel Detector(ALPIDE) and the Korea Multi-Purpose Accelerator Complex(KOMAC)", *New Phys.: Sae Mulli*, **vol.69**, 283 (2019) *(Co-Author)*
2. **Minjae Kwon**, *Magnus Mager, Markus Keil*, "Analysis Of Cosmic Ray Data Taken During The Commissioning Of The New ALICE Inner Tracking System)", *CERN Summer Student Programme Report*, CERN CDS : CERN-STUDENTS-Note-2019-128 (2019)

Languages

Korean	Native	*Mother Tongue*
English	Intermediate: B2	*1st Foriegn Language*
Japanese	Elementary: A2	*2nd Foriegn Language*
French	Beginner: A1	*3rd Foriegn Language*

Computing Skills

Bold: Well Skilled

Programming Laguage	**C++**, **Python**, Fortran, Shell Script	Monitoring System	Grafana, Prometheus
Mathematics Tool	**MATLAB**, **Mathematica**	Physics Package	**ROOT**, **GEANT4**
Operating System	**Linux**, **MacOS**	Graphical Design	**Photoshop**, **Illustrator**, Indesign
Mechanical Design	AutoCAD, **Fusion360**	Others	**LaTeX**, Docker, HTCondor, Jekyll

Developed Software

RooParticle, *C++*, [Simulation], github: isaac-kwon/rooparticle.
Particle tregectary simulation with naive method. The trajectory of the particle is simulated based on forces between each particle pair and relatively infinitesimal time. The unit system and physical constants are constructed for the time and length of the inter-nucleus scale($\sim 1\mathrm{fm}$ and $\sim 1\mathrm{fm}/c$). This library uses several classes of ROOT.

qupid, *C++*, [Monte-Carlo Simulation, Pixel Detector, Physics Modelling], doi: 10.5281/zenodo.5519749 .
QUasi signal generation model for PIxelized Detector. This library is developed for the fast simulation of the pixel cluster on the silicon pixel detector fired by a very large amount of e-h pairs, i.e. signal by α particle. With this simulation, the statistical distribution caused by geometrical reason could be revealed. This library was developed with python in initially, converted to C++ to improve the computation speed.

new-alpide-software, *C++*, [Detector Control], (CERN Internal Access) .
The `new-alpide-software` is detector control software with C++. It controls silicon pixel detectors developed by ALICE. The classes `TEventTaking`, `TEventAnalysis` are developed. The objective of this developement is breaking-through the time critical problem of edge-analysis about each taken data. The classes run in multi-threading mode and communicate.