Uzziel Perez

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PROFESSIONAL EXPERIENCE

UNIVERSITY OF ALABAMA | Graduate Research Assistant
January 2020- Present | Geneva, Switzerland

- Conducted various studies primarily, Monte-Carlo Simulation Studies for physics models to be compared to several Petabytes of data from the CMS Detector of the Large Hadron Collider (LHC) from 2016 to 2018. More on Research Experience below.
- Developed additional software features for Data Acquisition for HCAL subdetector of CMS - CMS HCAL Online Software (cmshcos)

UNIVERSITY OF ALABAMA | Graduate Teaching Assistant
August 2016 – December 2019 | Tuscaloosa, AL

- Teaching Assistant for "Physics for Physics Teachers" (Summer 2019), "Descriptive Physics" (Fall 2019), PH 106(102) Electromagnetism Calculus-based (regular non-calculus-based and Honors Courses)
- Summer Lecturer for a Calculus-based Electromagnetism course (2019)

THE MIND MUSEUM | Science Education Officer
March 2012 - September 2015 | Bonifacio Global City, Taguig, Philippines

- Created and co-lead science education programs such as "Soccer Science" (main lead) and "MakerSpace".
- Forged partnernships with Industry sponsors such as Mitre and 3M with the help of our Marketing team. This enabled public school students to participate in the a fully-funded Soccer Science Workshop and support a group of engineering students from Palawan State University to create a prototype of a portable desalinator.
- Designed science exhibits on Feynman diagrams, Timeline of the Universe and Holograms with the help of Exhibit Engineers and External Artists.

EDUCATION

UNIVERSITY OF ALABAMA | PhD in Physics
Expected May 2022 | Tuscaloosa, Alabama, USA | Cum. GPA: 3.87/4.0

ATENEO DE MANILA UNIVERSITY | BS Physics
March 2012 | Quezon City, Philippines | Cum. GPA: 3.24 / 4.0

RESEARCH ACTIVITIES

CERN | Researcher
January 2020-Present | Geneva, Switzerland

- Led the completion of "Closure Test Studies" for an analysis to confirm that our method for determining "fake signals" rate on data works as expected in simulation. I worked on improving the code pipeline for the test to reduce "time-to-physics", facilitate multiple plot production iterations and debugging for 2016, 2017, 2018 datasets.
- Developed flexibility support to maximize usefulness of limited bandwidth coming from the timing information of signals being detected in the barrel section of the HCAL using Look-Up Tables. Developed both a Database Implementation and a uniform setting of register values that could be sent to the server on the fly without having to make changes in the firmware.
- Implemented various fixes for opened in issues in the CMS Hcal Online Software (cmshcos) under the guidance of Dr. Seth Cooper and Dr. Aleko Khukhunaishvili.
- Volunteered for control room shifts for the upgrade and maintenance of the CMS Detector at P5 in Cessy, France during the Long Shutdown of the LHC.

UNIVERSITY OF ALABAMA | Researcher
January 2017-Present | Tuscaloosa, Alabama

- Worked with Dr. Conor Henderson, Dr. Christopher West and Andrew Bucilli to analyze additional data collected by the CMS Detector in 2017 and 2018

- Automated production of configuration files to produce Monte-Carlo Samples that covers multiple hypotheses phases spaces for various physics models
- Updated the CMSSW Workbook for Photon and Electron Analysis in order to help new users be familiarized with CMS computing tools and methods to jumpstart their physics analyses.

CERN | Summer Student
June 2015 – August 2015 | Geneva, Switzerland

- Worked with Dr. Henderson and Dr. Otman Charaf to do "Fake Rate" studies on a search for new physics using events with two photons.

SELECTED PRESENTATIONS

CMS Working Group Presentation

- ***Unparticles to diphotons***, MC & Interpretation Group | December 10, 2018
- ***Comparison of ADD Signal Distributions from Sherpa vs Pythia8***, MC & Interpretation Group | September 3, 2018

Schools, Seminars

- ***Discoveries, Exclusions and Measurements: Some new ideas and tools in HEP***, University of Alabama (UA) Experimental Particle and Astroparticle Physics Journal Club | April 12, 2019
- ***Image-based Deep Learning for Event Classification using CMS Detector Data (Review)***, UA Experimental Particle and Astroparticle Physics Journal Club | September 13, 2018
- ***Search for Extra Dimensions in the High-mass diphoton spectrum using proton-proton collisions at*** $\sqrt{s} = 13$ ***TeV***, Dark Matter Summer School, University at Albany, SUNY | July 19, 2018
- ***Introduction to machine learning in HEP***, UA Experimental Particle and Astroparticle Physics Journal Club | December 7, 2017
- ***Seminar on Robotics, Jupyter Notebook for Teachers***, San Pablo City Science High School | December 2015
- ***Introduction to Particle Physics***, Philippine Science High School | September 2015

PUBLICATIONS

Since fulfilling CMS authorship requirements via contributions to software and documentation for data-taking and analyses for the entire collaboration, I am listed as a coauthor on 7 papers since July 22, 2020. For the full list of papers, please see: inspirehep. Note: Collaboration Papers and Physics Analyses goes through several internal steps with timelines ranging from several months to years before being released for publication. Please see publication pipeline and full article on Life of a CMS Paper.

WORKSHOPS AND SUMMER SCHOOLS

CMS Data Analysis School | Fermi National Accelerator Laboratory (FNAL) | Illinois — January 2019
Computational and Data Science for High Energy Physics (CoDaS-HEP) | Princeton University, New Jersey — July 2017
Data Science in High Energy Physics (DS@HEP) Fermi National Accelerator Laboratory (FNAL) | Illinois — May 2017
CMS Data Analysis School | National Taiwan University, Taipei, Taiwan — February 2016
CERN School Philippines | University of the Philippines, Diliman, Quezon City — March- April 2014
International Workshop on Determination of the Fundamental Parameters of QCD | Nanyang Technological University, Singapore — March 2013

SKILLS

PROGRAMMING

Experience:

Python	8 years	GitHub	5 years	LaTeX	10 years	C++	5 years
JavaScript	less than 1 year	Shell	5 years	Markdown	2 years	Mathematica	less than 1 year

FRAMEWORKS

Deep Learning: Keras • Tensorflow
Data Analysis: ROOT
Web: React • Jekyll

LANGUAGES

Tagalog, English (Native, Fluent)
French, German, Spanish (Pre-Intermediate)
Japanese (Beginner)

MISCELLANEOUS

HACKATHONS

2020	-	**Science Communication Hackathon**, Particle Silo (with team of Artists, Scientists and Web Programmers)
2020	1st	ML4SCI 2020 Hackathon, Particle Images Challenge with Aditya Upreti and Abhipsa Acharya
2019	2nd	LHC ML Hackathon, Particle Images Challenge with Anna Parul and Nirmal Baral
2015	2nd	Team **Everware**, CERN Summer Student Webfest

CERTIFICATION

Neural Networks and Deep Learning | Coursera | September 9, 2017
Neural Networks: Hyperparameter tuning and Optimization | Coursera | September 24, 2017
Convolutional Neural Networks | Coursera | March 11, 2018

OUTREACH

Particle Silo | November 2020 - Present

- Created a prototype of a one-stop shop repository of high-quality, royalty-free particle physics scicomm images, videos during the weekend November 13-15, 2020.
- Collaborated with a team of artists, scientists and web programmers during pre-hack sessions to determine the functionality and main features of the product.
- The project is currently being incubated by SciCommHack Organizers and Sponsors. Moving forward, we intend to market a fully functional product for science communicators.

CNN Philippines, Mind S-Cool interview | August 2020

- Interviewed by Host Pecier Decierdo on How the Large Hadron Collider works and how there are things smaller than atoms.
- Mind S-Cool is a Science TV program showed in CNN Philippines and developed by The Mind Museum to reach out the national audience during the COVID-19 pandemic.

Experimental Particle and Astroparticle Physics Journal Club | Fall 2018-Fall 2019

- Facilitated the EPP-APP Journal Club at UA. The club serves as an avenue for instructors researchers to share their work, discuss new findings and techniques and forge a community within the department.