Lloyd Villanueva

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PROFILE

Mathematical Physicist turned Data Scientist, with future aspiration to do a doctorate degree in Earth systems. He envision to have a novel contribution to the field using his rigorous training in mathematical physics and experience in data science.

EDUCATION

Abdus Salam International Centre for Theoretical Physics — Trieste, Italy
Postgraduate Diploma Program - Earth System Physics — Aug 2024 (expected)

University of the Philippines Diliman — Quezon City, PH
M.S. in Physics — July 2021
— Thesis: "Reduction Formulas of the Kampé de Fériet Function Arising from the Method of Finite-part Integration"

University of the Philippines Diliman — Quezon City, PH
B.S. in Physics, *cum laude* — July 2019
— Thesis: "Finite-Part Integration in the Presence of Poles and Branch Points and its Application to Ordinary Hypergeometric Function"

RESEARCH INTERESTS

Machine learning, deep learning, data science, Earth system physics, climate change, climate processes, geophysical & computational fluid dynamics, complex analysis, asymptotic and perturbation.

PUBLICATIONS

[1] L. L. Villanueva and E. A. Galapon, "Finite-part integration in the presence of competing singularities: Transformation equations for the hypergeometric functions arising from finite-part integration", *Journal of Mathematical Physics*, vol. 62, no. 4, p. 043 505, 2021.

[2] L. L. Villanueva and E. A. Galapon, "Integral representations of the derivatives of the gauss hypergeometric function with respect to its parameters", in *Proceedings of the Samahang Pisika ng Pilipinas*, vol. 39, 2021, SPP-2021-PC–11.

[3] L. L. Villanueva and E. A. Galapon, "Kampé de fériet function reduction formula via finite-part integration", in *Proceedings of the Samahang Pisika ng Pilipinas*, vol. 38, 2020, SPP-2020-2G–03.

[4] L. L. Villanueva and E. Galapon, "New representation of gauss hypergeometric function via finite-part integration", in *Proceedings of the Samahang Pisika ng Pilipinas*, vol. 37, 2019, SPP-2019-PB–02.

Affiliations

Theoretical Physics Group, Quantum and Mathematical Physics Subgroup Quezon City, PH
National Insitute of Physics, University of the Philippines
Member   2017–2022

- – Supervised undergraduate and high school intern of the institute for their assigned project.
- – Involved in Outright Research Grant Project No. 171711 and No. 191915, where we calculated and tabulated the finite-part integral of the special functions.

Employment

Security Bank Corporation   Makati City, PH
Data Scientist (Assistant Manager)   Jan 2023–Aug 2023

- – Works with various business units to discover and develop models, products, or solutions that help the bank achieve its objectives such as improving the operations of the bank, reducing business costs, or increasing the bank's revenues.
  - - Develop a churn model of deposit customers for the bank retention program and a propensity model of credit card customers for the bank cross-selling initiative.
  - - Write and implement automated data comparison scripts in validating data between on-premise and cloud databases.

Omdena | Local Chapter Challenges
Junior Machine Learning Engineer (Volunteer)   Aug 2022–Dec 2022

- – Berlin, Germany local chapter - "Estimating CO2 footprint of common groceries"
  - - Compiled and curated a comprehensive dataset on the CO_2 footprint of common groceries, leveraging a variety of sources including public records, industry reports, and proprietary databases.

National Institute of Physics, University of the Philippines Diliman   Quezon City, PH
Instructor   Aug 2019–Jan 2023

- – Courses handled: Mechanics (Physics 71), Electromagnetism (Physics 72), Fundamental Physics Laboratory (Physics 71.1, Physics 106.1 and Physics 72.1), Computer Methods in Physics (Applied Physics 155).
- – Socials committee head of the Institute for the Academic Year 2020–2021, where I spearheaded events of the institute, and also served as the representative of the institute in the college-level socials committee.

Conferences and Workshops

- **Joint ICTP-IUGG Workshop on Data Assimilation and Inverse Problems in Geophysical Sciences**
  Virtual
  indico.ictp.it/event/9643/   October 2021
  Participant

- **39**th **Samahang ng Pisika ng Pilipinas Conference**
  Virtual
  spp-online.org/spp2021/   October 2021
  Poster Presenter

- **Prediction and Variability of Air-Sea Interactions: the South Asian Monsoon**
  Virtual
  icerm.brown.edu/topical_workshops/tw-21-pvsam/   August 2021
  Virtual Attendee

- **38**th **Samahang ng Pisika ng Pilipinas Conference**
  Virtual
  spp-online.org/spp2020/   October 2020

Short Presentation

- **Teaching Effectiveness Course**
  Virata Hall, University of the Philippines Diliman
  oat.upd.edu.ph/teaching-support-programs-2/teaching-effectiveness-course/ January 2019
  Participant

- **37*th* Samahang ng Pisika ng Pilipinas Conference**
  Tagbilaran City, Bohol, Philippines
  spp-online.org/spp2019/ June 2019
  Poster Presenter

SCHOLARSHIPS

- UP Employee/Faculty Study Privilege 2019–2022
- Science and Technology Scholarship Act of 1994 2014–2019

SKILLS AND LANGUANGES

- **Proficiency in:** Python, Fortran, Maple, Wolfram Mathematica, Julia, MATLAB LaTeX, TikZ, MS Office, Jira & Confluence, Cloud Computing

- **Familiar with:** AutoCAD, Arduino, OpenFOAM

- **Languages:** Filipino, English

REFERENCES

- **Eric Galapon, Ph. D.**
  Professor
  National Insitute of Physics
  University of the Philippines Diliman
  eagalapon@up.edu.ph

- **Ian Vega, Ph. D.**
  Professor
  National Insitute of Physics
  University of the Philippines Diliman
  ivega@nip.upd.edu.ph

- **Reinabelle Reyes, Ph. D.**
  Associate Professor
  National Insitute of Physics
  University of the Philippines Diliman
  rreyes@nip.upd.edu.ph