

Education

2011	Ph.D. in Physics Experimental High Energy Physics	2001	B.S. in Physics (Honors) Minors in Applied and Pure Mathematics
2004	M.S. in Physics		

Work Experience

2011 – Present	Postdoctoral Researcher, Florida International University
2005 – 2011	Research Assistant, Baylor University
2004 – 2005	Teaching Assistant, Baylor University
2002 – 2004	Teaching Assistant, University of Cincinnati
2001 – 2002	Assistant Lecturer, University of Colombo, Sri Lanka
2001	Visiting Lecturer, Institute of Technological Studies, Sri Lanka
1995 – 1996	Programmer and Data Entry Operator, The Orient Club, Sri Lanka

Research Experience

COMPACT MUON SOLENOID (CMS) AT CERN June 2011 – Present

– Physics Data Analyses

Using multi-petabyte datasets search for hypothetical fundamental particles predicted by Supersymmetry theory. Developed analysis methods and new data structures to speed up analysis, developed Monte Carlo methods to understand collision data and significantly reduce uncertainties in the physics measurements resulting in calculating most stringent limits on ‘gluino’ and ‘neutralino’ particle masses. [JHEP 06 (2014) 055] [[GitHub](#)]

I also search for hypothetical ‘Stop’ particle predicted by Supersymmetry theory. Monte Carlo data is used to verify techniques and model physics measurements resulting in generating strong limits on mass of the ‘Stop’ particle. [In the final stage of collaboration approval] [[GitHub](#)]

- Validate the effects of CMS data analysis framework development on reconstructed physics objects and physics measurements, administer an independent software package that generates the validation reports [[GitHub](#)]
- Provide operational support for collision data recording by monitoring and validating the quality of the recorded data.
- Support CMS data preservation by testing the ability to access data for data analyses under different software environments.
- Study pathological events and develop software-based filters to remove them [[GitHub](#)]
- Mentor graduate students

○ ROOT (C++ framework for physics data analysis)	○ C++	○ Python	○ R
○ Grid computing (Open Science Grid with WLCG)	○ GitHub	○ CVS	○ L ^A T _E X
○ Mathematical modeling	○ Statistics	○ Simulation	○ Linux
○ Scientific writing	○ Public speaking		

COLLIDER DETECTOR AT FERMILAB (CDF)

May 2005 – May 2011

– Physics Data Analysis

Searched for new physics using photon + jets + missing energy candidate events recorded from proton-antiproton collisions. Candidate events were isolated from a multi-petabyte dataset and their kinematic properties were studied in detail for discrepancies, developed and tested Monte Carlo techniques to model and understand collision data [Dissertation] [[GitHub](#)]

– CDF Tracker Upgrade

Developed software for reprogramming various logic boards that are essential to particle track identification and used in the Level-1 track trigger. Optimized the flash RAM reprogramming of those

- boards by introducing threaded parallel programming and job queuing which reduced the reprogramming time by more than 50%, developed a Java based command line utility to remote reprogram the logic boards, updated existing software to provide more detailed information about new hardware and software installed in front-end readout crates,. [Nucl. Instrum. Meth. A **572**, 358–360 (2007)]
- Supported online data acquisition system as an on-call expert for the Level-1 track trigger, served as a CDF data acquisition expert and a data quality monitor.
- Monitored and generated operational status of the Central Preshower subdetector, merged the sub-detector calibration process with the rest of the detector offline calibration process, streamlined and simplified the gain-check and high voltage status monitoring of the detector [[GitHub](#)]

- ROOT (C++ framework for physics data analysis)
- Grid computing (HTcondor)
- Statistics
- C++
- Mathematical modeling
- Simulation
- Scientific writing
- VxWorks
- Public speaking
- Java
- CVS
- \LaTeX
- Linux

Conference Presentations

- 2013, Talk on “Search for New Physics in Events with Jets and Missing Transverse Momentum Using LHC Data” at the Phenomenology Symposium, University of Pittsburg
- 2011, 2010, 2009, Seminars on “Search for Anomalous Production of Photon + Jets” at Florida International University, Texas Tech University, Louisiana State University, and National Taiwan University
- 2008, Poster on “Search for Anomalous Production of Photon + Jets” at the 34th International Conference on High Energy Physics, University of Pennsylvania, Philadelphia
- 2008, Talk on “Search for Anomalous Production of Photon + Jets” at the April Meeting of the American Physical Society, St. Louis

Selected Publications

- “Search for new physics in the multi-jets + missing transverse energy final state in 7 TeV proton-proton collisions”, The CMS Collaboration, JHEP 06 (2014) 055
- “Search for new physics in the multi-jet and missing transverse momentum final state in proton-proton collisions at $\sqrt{s} = 7$ TeV using LHC data, The CMS Collaboration, Phys. Rev. Lett. **109** (2012)
- “Search for Anomalous Production of Photon + Jets in $p\bar{p}$ Collisions at $\sqrt{s} = 1.96$ TeV using the CDF Detector” Proceedings of the 34th International Conference on High Energy Physics, Philadelphia, USA, July 29–August 5, 2008, Samantha Hewamanage, FERMILAB-CONF-08-471-E
- “The CDF II eXtremely Fast Tracker upgrade”
A. Abulencia *et al.* (CDF Collaboration), Nucl. Instrum. Meth. A **572**, 358–360 (2007)

In addition to the above, I am a member of the CMS collaboration author list since 2012 and was a member of the CDF collaboration author list from 2006 to 2012 with over 400 publications and more than 20,000 citations. I have also authored or co-authored over 10 internal notes at CDF and CMS. [[Google Scholar](#)]

Certifications

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| Oct. 2013 | Computing for Data Analysis (in R), Johns Hopkins on Coursera.org |
| Dec. 2013 | Statistics One (in R), Princeton University on Coursera.org |
| 2001 | Computer Hardware Engineering, Raytronics Computer Systems, Sri Lanka |
| 1997 | Chartered Accountants Level-1, Inst. of Chartered Accountants of Sri Lanka |
| 1995 – 1996 | Computer Based Accounting, Programming in FoxPro, Computing & Information Technology, OpenArc Computer School, Sri Lanka |

Open Data Analyses & Machine Learning

I take part in Kaggle competitions and attend MeetUp groups on machine learning to expand my knowledge big data analytics.

- Geospatial analysis on ‘Summer opportunities for students in Chicago school district’ which studies the availability and accessibility of summer jobs for city children (started as a group project during a recent MeetUp) [[Visualization](#)]
- Higgs Boson Machine Learning Challenge (ongoing) [[GitHub](#)]
- Titanic: Machine Learning from Disaster (ongoing) [[GitHub](#)]