Pratyush Das

PhoneEmail

(+91) 9051603323 reikdas@gmail.com

• GitHub

https://github.com/reikdas

Education

Institute of Engineering & Management, Kolkata

2017-2021 (Expected)

Bachelor of Technology in Computer Science and Engineering. CGPA: 8.43/10

Don Bosco School, Park Circus, Kolkata

2016

High School (Council For The Indian School Certificate Examinations)

Work Experience

IRIS-HEP - Fellow

June, 2020 - September, 2020

Supervisor - Dr. Jim Pivarski (Princeton University)

- Awkward Array: Library for nested, variable-sized data using NumPv-like idioms
 - Created a source to source compiler to generate equivalent Python for a subset of C++.
 - Created a property based testing framework.
 - Created a source to source compiler to generate equivalent parallel CUDA from specification (Python and type info).

IRIS-HEP - Fellow

June, 2019 - September, 2019

Location: Fermi National Accelerator Laboratory, USA - LHC Physics Centre

Supervisor - Dr. Jim Pivarski (Princeton University)

- Uproot: Python implementation of ROOT I/O, an open source file format storing over an exabyte of HEP data
 - Completed ROOT file writing interface by adding functionality to write ROOT files with TTrees.
 - Uproot has become one of the most widely used Physics libraries (50K+ downloads)

DIANA-HEP - Fellow

June, 2018 - September, 2018

Location: Fermi National Accelerator Laboratory, USA - LHC Physics Centre

Supervisor - Dr. Jim Pivarski (Princeton University)

- Uproot
 - Co-developed the Uproot library with Jim Pivarski; authored the ROOT file writing interface.
 - Examined ROOT serialization of objects and added functionality to write ROOT files with object strings and histograms.

Volunter Research Experience

Supervisor - Dr. Vassil Vassilev (Princeton University)

November, 2019 - Present

- Collaborations: IRIS-HEP, CERN ROOT Team, Compiler Research group
- ROOT: An open-source data analysis framework storing over an exabyte of data Created new unit testing library, ROOTUnitTestSupport
 - Fixed several rootcling bugs
 - Fixed packaging for macOS
- Cling: Interactive C++ interpreter built on top of Clang
 - Configured installer to build using LLVM binary
 - Reconfigured CI
- Clang: C language family frontend for LLVM
 - Fixed template cast and suffix printing bug (under review)
 - Fixed type printing of template arguments (under review)
- Clad: Clang plugin for automatic differentiation
 - Moved CI from Travis to Github Actions.

Supervisor - Dr. Jim Pivarski (Princeton University)

January, 2021 - February, 2021

Collaborations: IRIS-HEP

- Awkward Array
 - Created a parser for Awkward Array's type system

Supervisors - Dr. Jim Pivarski (Princeton University), Dr. Viktor Khristenko (CERN)

June, 2017 - August, 2017

Collaborations: CERN CMS Big Data Project, DIANA-HEP

- spark-root Apache Spark datasource for ROOT
 - Separated spark bindings from TTree reading code.
- root4j Java implementation of ROOT file reader
 - Optimized codebase to facilitate interoperability

Programming Languages and Tools	
Experienced: Python, C, CUDA, *nix Familiar: C++, Java, ROOT, Haskell, Standard ML, LLVM, Clang	
Summer Schools	
Computational and Data Science for High Energy Physics (CoDaS-HEP) Princeton University Interviewed - Princeton University News	2019
Publications	
 J.Pivarski, I.Osborne, P.Das, D.Lange, P.Elmer, "AwkwardForth: accelerating Uproot with an internal DSL", 25th Conference on Computing in High-Energy and Nuclear Physics (vCHEP, 2021). [Submitted] J.Pivarski, I.Osborne, P.Das, A.Biswas, P.Elmer, "Awkward Array: JSON-like data, NumPy-like idioms", Proc 19th Python in Science Conference (SciPy USA, 2020), Pages 68-74, DOI: 10.25080/Majora-342d178e-00b. E.Rodrigues, et al., "The Scikit HEP Project - overview and prospects", Proceedings of the 24th International Computing in High Energy and Nuclear Physics (CHEP 2019), DOI: 10.1051/epjconf/202024506028. N.Saha, P.Das, H.N.Saha, "Authorship Attribution of Short Texts using a Multi Layer Perceptron", Internation Applied Pattern Recognition, 2018 Vol. 5 No. 3, Pages 251-259, DOI: 10.1504/IJAPR.2018.10016100. 	2021 eedings of the 2020 Conference on 2020
Talks at Conferences	
 Python in High Energy Physics. -PyCon USA (Remote) Python in High Energy Physics 	2020
-SciPy India (Indian Institute of Technology, Bombay) • The Scikit-HEP Project: Overview and Prospects - Eduardo Rodrigues et al24th International Conference on Computing in High Energy and Nuclear Physics (University of Adelaide)	2019 2019
• Writing files with uproot -PyHEP (Abington, UK)	2019
• Writing files with uproot -ROOT Users' Workshop (Academy of Sciences and Arts of Bosnia and Herzegovina)	2018
Talks at Meetings	
 Language Transformations for the Awkward Array library -IRIS-HEP Fellow Presentations (Remote) CUDA backend for the Awkward Array project 	2020
-Princeton University Liberty Research Group Meeting (Remote) • Writing TTrees with uproot	2020
-IRIS-HEP Topical Meeting: Summer student project presentations (Remote) • Writing files with uproot	2019
-DIANA Meeting: Updates on ROOT I/O (Remote) • Separation of Concerns - Refactoring code between ROOT4J and Spark-Root	2018
-DIANA Meeting: Student Projects (Remote); CMS Big Data Science Projects (Remote)	2017
Academic Achievements	
 Awarded the IRIS-HEP undergraduate fellowship by Princeton University. Awarded travel grant to speak at PyCon USA 2020 in Pittsburgh, USA. 	2020 2020
 Awarded travel grant to speak at 1 yeon OSA 2020 in 1 itsburgh, OSA. Awarded travel grant to attend PLMW and POPL 2020 in New Orleans, USA. 	2019
• Awarded travel grant to attend CoDaS-HEP summer school at Princeton University.	2019
• Awarded the IRIS-HEP undergraduate fellowship by Princeton University.	2019
• Awarded travel grant to speak at ROOT Users' Workshop 2018 in Sarajevo, Bosnia and Herzegovina.	2018
• Awarded the DIANA-HEP undergraduate fellowship by Princeton University.	2018
Extracurricular Achievements	
• International Rated Chess Player (Federation Internationale des Echecs)	2016
• Adhyayan National Student Leadership Contest (Adhyayan India) - Third	2015
• IT Quiz (Computer Society of India) - Second	2014