

Pratyush Das

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Education

Institute of Engineering & Management, Kolkata <i>Bachelor of Technology in Computer Science and Engineering. CGPA: 8.43/10</i>	2017-2021 (Expected)
Don Bosco School, Park Circus, Kolkata <i>High School (Council For The Indian School Certificate Examinations)</i>	2016

Work Experience

IRIS-HEP - Fellow Supervisor - Dr. Jim Pivarski (Princeton University) <ul style="list-style-type: none">• Awkward Array: Library for nested, variable-sized data using NumPy-like idioms<ul style="list-style-type: none">- 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).	June, 2020 - September, 2020
IRIS-HEP - Fellow Location: Fermi National Accelerator Laboratory, USA - LHC Physics Centre Supervisor - Dr. Jim Pivarski (Princeton University) <ul style="list-style-type: none">• Uproot: Python implementation of ROOT I/O, an open source file format storing over an exabyte of HEP data<ul style="list-style-type: none">- 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 (100K+ downloads)	June, 2019 - September, 2019
DIANA-HEP - Fellow Location: Fermi National Accelerator Laboratory, USA - LHC Physics Centre Supervisor - Dr. Jim Pivarski (Princeton University) <ul style="list-style-type: none">• Uproot<ul style="list-style-type: none">- 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.	June, 2018 - September, 2018

Volunter Research Experience

<i>Supervisor</i> - Dr. Vassil Vassilev (Princeton University) <i>Collaborations:</i> IRIS-HEP, CERN ROOT Team, Compiler Research group <ul style="list-style-type: none">• ROOT: An open-source data analysis framework storing over an exabyte of data<ul style="list-style-type: none">- Created new unit testing library, ROOTUnitTestSupport- Fixed several rootcling bugs- Fixed packaging for macOS• Cling: Interactive C++ interpreter built on top of Clang<ul style="list-style-type: none">- Configured installer to build using LLVM binary- Reconfigured CI• Clang: C language family frontend for LLVM<ul style="list-style-type: none">- Fixed template cast and suffix printing bug (under review)- Fixed type printing of template arguments (under review)• Clad: Clang plugin for automatic differentiation<ul style="list-style-type: none">- Moved CI from Travis to Github Actions.	November, 2019 - Present
<i>Supervisor</i> - Dr. Jim Pivarski (Princeton University) <i>Collaborations:</i> IRIS-HEP <ul style="list-style-type: none">• Awkward Array<ul style="list-style-type: none">- Created a parser for Awkward Array's type system	January, 2021 - February, 2021
<i>Supervisors</i> - Dr. Jim Pivarski (Princeton University), Dr. Viktor Khristenko (CERN) <i>Collaborations:</i> CERN CMS Big Data Project, DIANA-HEP <ul style="list-style-type: none">• spark-root - Apache Spark datasource for ROOT<ul style="list-style-type: none">- Separated spark bindings from TTree reading code.• root4j - Java implementation of ROOT file reader<ul style="list-style-type: none">- Optimized codebase to facilitate interoperability	June, 2017 - August, 2017

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) <i>Princeton University</i>	2019
• Interviewed - <i>Princeton University News</i>	
Publications	
• J.Pivarski, I.Osborne, P.Das , D.Lange, P.Elmer, “AwkwardForth: accelerating Uproot with an internal DSL”, 25th International Conference on Computing in High-Energy and Nuclear Physics (vCHEP, 2021). <i>[Submitted]</i>	2021
• J.Pivarski, I.Osborne, P.Das , A.Biswas, P.Elmer, “Awkward Array: JSON-like data, NumPy-like idioms”, Proceedings of the 19th Python in Science Conference (SciPy USA, 2020), Pages 68-74, DOI: 10.25080/Majora-342d178e-00b.	2020
• E.Rodrigues, et al., “The Scikit HEP Project - overview and prospects“, Proceedings of the 24th International Conference on Computing in High Energy and Nuclear Physics (CHEP 2019), DOI: 10.1051/epjconf/202024506028.	2020
• N.Saha, P.Das , H.N.Saha, “Authorship Attribution of Short Texts using a Multi Layer Perceptron”, International Journal of Applied Pattern Recognition, 2018 Vol. 5 No. 3, Pages 251-259, DOI: 10.1504/IJAPR.2018.10016100.	2018
Talks at Conferences	
• Python in High Energy Physics. - <i>PyCon USA (Remote)</i>	2020
• Python in High Energy Physics - <i>SciPy India (Indian Institute of Technology, Bombay)</i>	2019
• The Scikit-HEP Project: Overview and Prospects - Eduardo Rodrigues et al. - <i>24th International Conference on Computing in High Energy and Nuclear Physics (University of Adelaide)</i>	2019
• Writing files with uproot - <i>PyHEP (Abington, UK)</i>	2019
• Writing files with uproot - <i>ROOT Users' Workshop (Academy of Sciences and Arts of Bosnia and Herzegovina)</i>	2018
Talks at Meetings	
• Language Transformations for the Awkward Array library - <i>IRIS-HEP Fellow Presentations (Remote)</i>	2020
• CUDA backend for the Awkward Array project - <i>Princeton University Liberty Research Group Meeting (Remote)</i>	2020
• Writing TTrees with uproot - <i>IRIS-HEP Topical Meeting: Summer student project presentations (Remote)</i>	2019
• Writing files with uproot - <i>DIANA Meeting: Updates on ROOT I/O (Remote)</i>	2018
• Separation of Concerns - Refactoring code between ROOT4J and Spark-Root - <i>DIANA Meeting: Student Projects (Remote); CMS Big Data Science Projects (Remote)</i>	2017
Academic Achievements	
• Awarded the IRIS-HEP undergraduate fellowship by Princeton University.	2020
• Awarded travel grant to speak at PyCon USA 2020 in Pittsburgh, USA.	2020
• 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