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Statistical and Data Analysis Package in SWIFT

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SWIFT is a compiled object-oriented language similar in spirit to C++ but with the coding simplicity of a scripting language. Built with the LLVM compiler framework used within Xcode 6 and later versions, SWIFT features interoperability with C, Objective-C, and C++ code, truly comprehensive debugging and documentation features, and a host of language features that make for rapid and effective development of robust and easily debuggable software and APPs. As of version 2.2, SWIFT is now open source and made available under APACHE license 2.0 for development on APPLE platforms and LINUX.

I present the design and implementation of a math and statistics package which features single and multi-dimensional functions, including most common functions used in math such as Bessel functions, Laguerre and Legendre polynomials, etc,. The package also features classes for vectors, matrices and related linear algebra, a limited set of physics tools including rotations, Lorentz vectors, etc, multi-dimensional histograms, fast and robust moments calculation, calculation of correlation functions, statistical tests, maximum likelihood and least square fits, and extensible random number generation tools, as well as basic plotting capabilities. The code is developed based on a relatively small number of classes implementing a basic set of protocols. Given SWIFT's interoperability with other languages, the presented package should be easy to integrate within existing computing environments, such as ROOT. I developed the presented package in two months during the summer 2015.

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Analysis tools and techniques

Secondary Keyword (Optional)

Algorithms

Tertiary Keyword (Optional)

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