Proposal Review 3 : 2152988

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Agency Name:	National Science Foundation
Agency Tracking Number:	**2152988**
Organization:	
NSF Program:	CDS&E-MSS
PI/PD:	Hickernell, Fred
Application Title:	Collaborative Research: Quasi-Monte Carlo for Efficient Simulation
Rating:	Good

Review

Summary

In the context of the five review elements, please
evaluate the strengths and weaknesses of the proposal with respect to intellectual merit.

The research proposal has some well written parts, with PIs clearly articulating the relevance of the work and how it serves to advance areas such as big data analytics, Bayesian computation, machine learning, to name a few.

In addition, the narrative of the proposed project contains very intuitive routes the team of investigator intend to utilize to tackle such research problems, especially regarding theoretical issues surrounding convergence and variance reduction.

Both PIs, with their background and network of collaborators, pose the needed qualification to undertake and succeed at the listed research activities.

In the context of the five review elements, please
evaluate the strengths and weaknesses of the proposal with respect to broader impacts.

In line with seeking to advance the utility QMCPy software environment, the proposal clearly mentions the intent to mentor and train students, particularly given preference to underrepresented and minority candidates.

However, it is not clear whether students will be solely graduates or undergraduates, or a blend of the two.

I have concerns with the PIs being able to fully achieve the entirety of the proposal's research objectives within the stipulated timeframe.

PIs demonstrate excellent track record with their prior NSF awarded support, thereby producing several publications, and participating in workshops for the purpose of research dissemination.

Please evaluate the strengths and
weaknesses of the proposal with respect to any additional solicitation-specific review criteria, if
applicable

The narrative and objective of this proposal detail sufficient motivation reflecting advances in areas such as big data analytics, machine learning, just to name a few.
In addition, the PIs meet a solid mark by planning to advance a software computation environment (QMCPy) which will facilitate research development and data analytics across diverse disciplines.

Summary Statement

This research project intends to extend the potential application of an already existing method, the Quasi Monte-Carlo sampling, beyond its preset boundaries of application. In addition, the PIs intend to grow an open-source python software library (the QMCPy) to include avenues for testing their ideas with benchmark/state-of-the-art techniques in areas such as big data analytics, machine learning and uncertainty quantification.

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