Editors' Message

*W*elcome to this special issue of Reliability Magazine.

For many years the reliability engineering profession has been centered around the use of data, and in fact, has in many ways pioneered the use of data is such areas as network and computer operations, financial transactions, statistical quality control in manufacturing, and analysis of failure data for reliability predictions involving complex systems and processes. Many applications in reliability engineering over the last half century have involved data that are/were "Big" in the context of the technology available at the time. What has changed, and continues to change at a very rapid rate, is the expansion of the applications that have access to very large, very high velocity datasets, presented in a variety of formats consistent with the "3Vs" characteristic of Big Data. In reliability engineering, much of this is driven by the proliferation of sensors, that is, the Internet of Things (IoT), but it includes a variety of other sources as diverse as scientific experiments, medical records, and social networks. The result of this is the ability to address applications that were either too complex, too costly, or simply impossible previously.

The Reliability Society (RS) continues to play an active role in the areas of Big Data and IoT with several of its members active on the IEEE Big Data and IoT Initiative steering committees and contributing content to publications and international conferences on these topics. The Big Data Initiative (BDI) funded by the IEEE Future Directions Committee is now in its third year of operation and has been responsible for several new developments including the IEEE DataPort portal, and has hosted workshops for developing standards for Big Data. BDI is also currently in the process of developing several new publications on Big Data in collaboration with several IEEE societies and councils. Visit bigdata.ieee.org to learn more.

In this issue, we have collected three articles which provide different view of this emerging and exciting capability.

The first article, "Grid Reliability Depends on Big Data" is by Steven Collier, Director of Smart Grid Strategies at Milsoft Utility Solutions. This article focuses on the real time operation of one of our most important, and complex, networks. The electric grid is not only complex and crucial, but as outlined in this article, is undergoing fundamental change in structure, technology, and critically, the data that it produces for real time management and operations.

The second article, "Farming Big Data must allow for hills and valleys that affect quality and reliability" is by Ron Hiller,founder of BLX.io and Mahmoud Daneshmand of Stevens Institute of Technology. It highlights the critical issue of the reliability and quality of the data itself, particularly with an eye towards use for analysis, decision making, and control. It also presents this within the context of another crucial industry, farming; an industry which we perhaps do not associate as much with big data.

The final article, "The Internet of Things and Big Data Systems: The International Bazaar" by Philip Laplante of Penn State University addresses issues for reliability engineers as big data moves from the few billion members of the "crowd" to the hundreds of billions of members of the Internet of things. These include issues such as security and standards.

We hope you enjoy the articles in this issue, and that you find these contributions to the discussion of big data and applications within the reliability engineering profession useful. We look forward to your comments and suggestions.

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