



Outlooks on Diverse Technologies

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Welcome to the January Outlook 2020 issue of Computer. The authors and topics for this issue were chosen for their timeliness and diverse content.

In this 2020 Outlook issue of *Computer*, four invited papers are included on a variety of diverse topics: 1) blockchain possibly benefiting low-income individuals, 2) supply chain cybersecurity, 3) software testing tied to input space coverage, and 4) augmented reality. I selected these authors and topics based on the timeliness of their content. Let me now introduce the articles.

In the first article, “Blockchain-Based Financial Technologies and Cryptocurrencies for Low-Income People: Technical Potential Versus Practical Reality,” Kshetri discusses blockchain-based financial technologies (fintechs) and cryptocurrencies that have supposedly been launched to improve the access to and affordability of financial services for lower-income individuals. The author highlights blockchain’s technical potential to serve the needs of the unbanked and underbanked populations. After reviewing the startups that have launched fintechs and cryptocurrencies, the author found no clear evidence that they are achieving their stated goals of helping these targeted populations. Instead, he states that

some startups are giving big companies and investors higher priority than those truly in need. He also maintains that new users often lack the skills and access to new opportunities that new technology can grant.

The contribution by Paulsen, “The Future of IT Operational Technology Supply Chains,” suggests that poor development practices, weak oversight and control, and conflicting priorities have led to an environment in which supply chains have been dubbed the “wild west” of cybersecurity. However, the author suggests that some noteworthy trends in the last few years point toward lasting changes in the developing cybersupply chain and risk-management discipline. This article identifies policy, technology, and business environment changes that are shaping how organizations will source, buy, build, deliver, dispose of, and ultimately protect IT/operational technology goods and services in the next decade.

“Input Space Coverage Matters,” by Kuhn et al., discusses how testing remains the most common approach for software assurance, even though software testing still is as much judgement

and art as it is a science. While structural coverage adds some rigor to the process by establishing formally defined criteria for some notion of test completeness, even full coverage, however it is defined, may miss faults related to rare inputs that were not included in the test suite. The authors suggest that structural coverage measures should be supplemented with measures of input space coverage. This article asserts that useful input space measures exist and have a relationship with structural coverage measures, providing a way to verify that an adequate input model has been defined.

Finally, in “The Promise of Interactive Shared Augmented Reality,” Peitso and Michael shed light on taking augmented reality to the next level, well beyond its current uses as a single-person entertainment or a task-assist system. The authors report that shared reality can be maintained as a distributed interactive real-time simulation and that, contrary to popular belief, it is technically feasible to maintain an effectively consistent shared state between all participants. Such a state enables many new and long-hoped-for capabilities in augmented reality systems, not only for humans but also to integrate machines into safety- and mission-critical system settings.

ABOUT THE AUTHOR

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hope you find these articles to be useful and informative. Happy New Year and best regards. 