

2024 IEEE CQR Emerging Technology Reliability Roundtable

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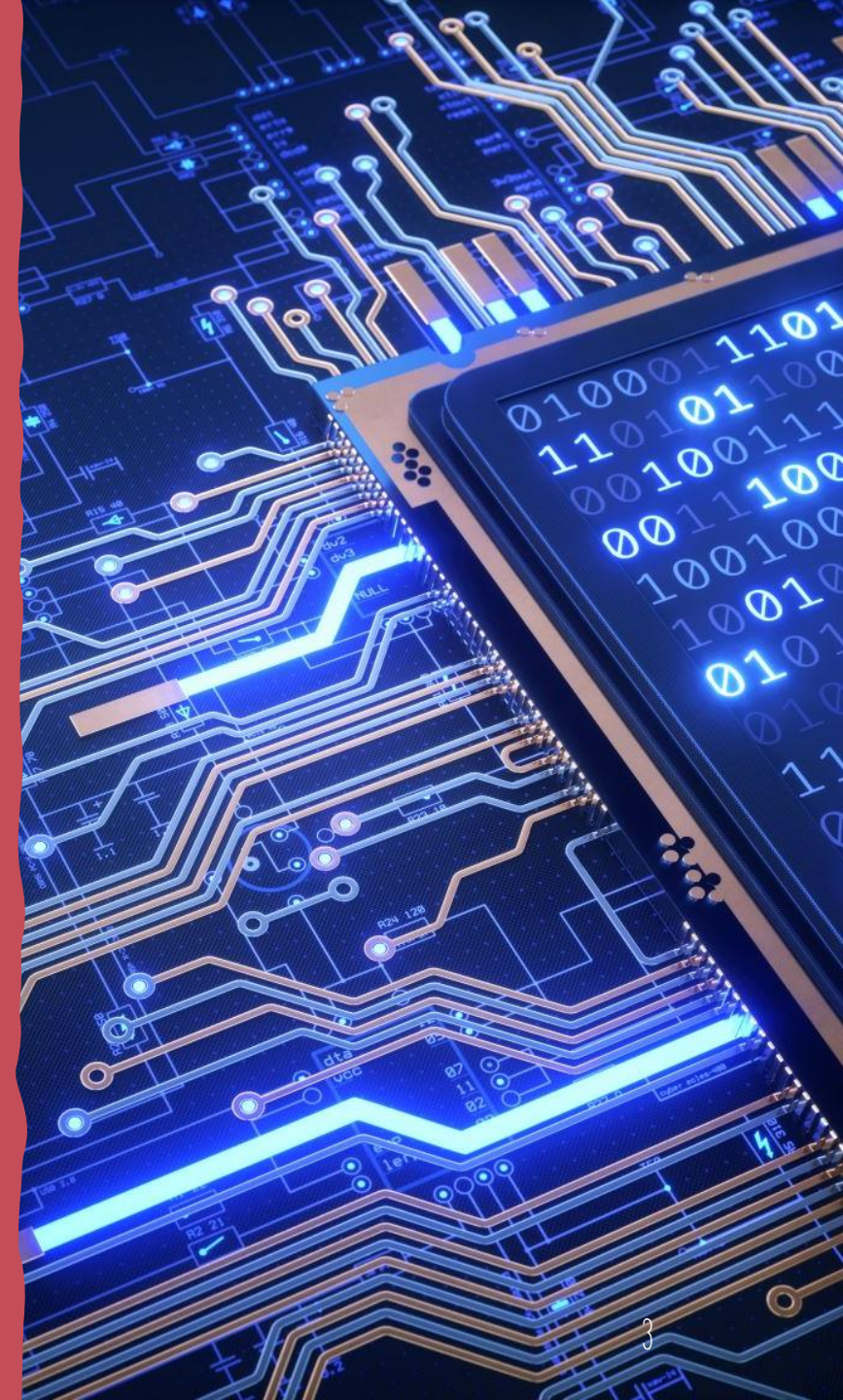
Opening Remarks

The world is moving rapidly into an AI-driven frenzy and the speed of innovation accelerates in many areas such as Semiconductors, AI-based processors (GPU), Sensors, Quantum Computing, Low Earth Orbit Satellites, Low Air Economy (self-drive flying cars and drones), and regenerative medicine. At the same time, the geopolitical conflicts, and economic models (along with the technology advancement) drive further reliability and security challenges in an unprecedented pace. CQR as a premier engineering organization focused on reliability and its Emerging Technology Reliability Roundtable (ETR-RT) must stay ahead of the industry and promote new standards and models to address such challenges and ensure technology change brings the positive impact to human societies.



Let's think about a few areas:

1. The current social and human interactions are changing dramatically compared to 5 or 10 years ago. What reliability and security concerns do we need to think about and address?
2. As our technology ecosystem is getting more complicated, the economic model drives profitability with never-ending thirst, how do we ensure the complexity of supply chain and end-to-end (ETE) reliability and security being addressed adequately? For example, Boeing's accelerated 737-Max development shortcut the thorough testing needed resulting in disastrous accidents, credibility, long-term profitability and sustainable growth! The scary part is that it did not happen in only one place but across the industry to allow business decisions to overtake or overrule sound engineering input!
3. How do we balance divide-and-conquer vs. ETE ecosystem integration?
4. How could a user-centric view help to improve industry reliability and security?
5. How do we best address cross-technology integration, such as terrestrial/satellite communications, as well as communication and sensor networks (hardware, and software)?



Let's think about a few areas (cont'l):

6. How will we, as the scientific and engineering community, ensure data integrity and accuracy, which is the critical element of delivering AI results?
7. How can we use the traditional encryption technology vs. the new blockchain and quantum computing techniques, and/or the combination of all to achieve a zero-tolerance security?
8. Can we leverage generative AI to auto-generate and auto-execute testing cases to ensure higher product quality, reliability, and security?
9. How do we make reliability, resiliency, and security part of the fundamental requirements and architecture of future technologies?
10. What does the reliability and security engineering community need to provide as guidelines and/or standards for product/technology development?

