The Honorable Randy Weber

1. How does your company use AI to harden your systems and implement safeguards including using "red-teaming?"
2. Viavi uses AI to simulate a communications network and improve the network's performance by running millions of different scenarios to test new components, software upgrades, and even physical threats like natural disasters. For 5G systems, spectrum efficiency is particularly important. How does Viavi use AI to ensure that 5G networks are as efficient as possible with the spectrum that they have?

1. VIAVI Solutions' products do not directly engage in "red-teaming" scenarios. However, the AI-generated data, which is amassed, evaluated, and enhanced through our solutions utilized by our customers (Service Providers and Equipment manufacturers), significantly bolsters the durability and resilience of both our products and our clients' services against challenges encountered during laboratory and field operations.

2. VIAVI's implementation of AI in optimizing 5G Radio Access Network (RAN) operations focuses on conserving limited spectrum resources while ensuring optimal Quality of Experience (QoE) for users. This optimization is achieved by analyzing extensive data sets, which include user mobility patterns, spectrum utilization fluctuations under varying environmental conditions, and dynamic user group requirements. This analysis enables predictive resource allocation. VIAVI supports this process by supplying tools for training and validating AI/ML algorithms, including a RAN scenario generator and geolocation tools for users, which feed data into these algorithms. Additionally, VIAVI's AI-enabled products are instrumental in detecting and resolving interference issues and fine-tuning network configurations. This capability enhances spectrum efficiency, elevates service quality, and prevents spectrum waste. VIAVI's automated spectrum intelligence technologies are adept at isolating distinct spectrum usage patterns, classifying transmission types, and pinpointing transmitter locations.

The Honorable Russ Fulcher

1. Dr. Yamany, we're spending a significant amount of money to deploy new broadband networks. Obviously, we want to make sure these networks perform. Can you talk about ways we can use AI to monitor the performance and quality of broadband networks, and whether this is something we should encourage more providers to do, especially with BEAD."

VIAVI's integration of Telco-AI into its product suite enhances the performance and quality monitoring of broadband networks. This is achieved through intelligent data collection at endpoints, where strategic decisions are made regarding the nature, volume, and frequency of data collection. Post-collection, these products assist in identifying performance and quality chokepoints, employing AI algorithms to flag potential issues for in-depth analysis by human experts.

Furthermore, VIAVI's Telco-AI enabled products offer enhanced monitoring capabilities for Broadband Equity, Access, and Deployment (BEAD) networks. This involves leveraging AI to swiftly detect anomalies, accurately locate the issue, determine the technical cause, and suggest remedial actions to restore service.

As broadband deployment expands, aiming to bridge digital divides, it is imperative for broadband providers to utilize advanced Telco-AI testing and optimization solutions. These tools not only monitor and optimize network performance and quality but also contribute to reducing the time required to resolve network issues, thereby maintaining high service standards.

The Honorable August Pfluger

1. When it comes to maximizing the potential opportunities of using AI technologies in our communications networks, what are the advantages of integrating AI into a network that is built upon modern Open RAN principles? What are the advantages to building upon Open Ran principles versus layering AI onto an existing 30-year-old network?

Open Radio Access Network (Open RAN) architecture fundamentally incorporates artificial intelligence (AI) to facilitate intelligent decision-making within the network via the RAN Intelligent Controller (RIC) platform. This platform operates on the principle of open interfacing, enabling seamless data acquisition and manipulation across different network elements. Additionally, it offers open Application Programming Interfaces (APIs) that empower application developers to innovate atop the RIC platform. This openness paves the way for smaller, agile startups to contribute their specialized skills to the ecosystem, diversifying the source of innovation. This approach stands in stark contrast to traditional legacy network frameworks, which are predominantly governed by a limited number of large-scale vendors, thereby centralizing innovation within a few dominant corporations.

The Honorable Anna Eshoo

1. Your written testimony describes how artificial intelligence (AI) can be used to improve network performance, increase resiliency, protect against malicious cybersecurity threats and security vulnerabilities, and respond to the effects of natural disasters.

   For the record, how have you and your company used AI for these purposes? Can you describe specific examples of how you and your company deployed AI in response to natural disasters and to what effect? What can Congress do to encourage innovation in this area of AI research, development, and deployment? What approach should Congress take to ensure innovation of AI in this area is not stifled?

VIAVI's suite of testing and optimization tools is adept at simulating various catastrophic and adversarial scenarios through its RAN scenario generator solutions. Central to this capability is

the implementation of AI algorithms within the RAN Intelligent Controller. These algorithms, such as anomaly detection and traffic steering, are engineered for rapid identification of network anomalies. Upon detection, they autonomously reroute data traffic from non-functional cells to adjacent operational cells, simultaneously augmenting the coverage range of these operational cells.

In situations where no neighboring cells are operational, the anomaly detection algorithms are programmed to alert network operation center personnel to deploy alternative solutions, such as cell-on-wheels (COW), in the affected areas. Furthermore, VIAVI's Telco-AI solutions have been instrumental in aiding the strategic deployment of public health resources in disaster scenarios. By modeling mobility patterns in crisis situations, VIAVI's solutions offer customers critical insights through both descriptive and predictive analysis of the movement of masses of people in emergencies.

It is recommended that Congress actively promote the adoption of AI-enabled monitoring and optimization applications by service providers, particularly for enhanced disaster response and management.

The Honorable Lizzie Fletcher

1. What would you recommend we be thinking about when it comes to fashioning digital privacy legislation in the context of AI? When we are thinking about how to put together a framework, what are the AI considerations that we should be taking into account in that process?

It is essential for legislative frameworks to distinctively characterize various AI use cases, recognizing the differing risk profiles and operational contexts. Telco-AI, which predominantly utilizes data from telecommunications networks, aims to enhance service performance while minimizing costs. This form of AI is inherently low-risk compared to consumer-focused AI applications. Telco-AI is characterized by its reliance on vast datasets, primarily concentrating on overarching network patterns, in contrast to the individualized data focus prevalent in many consumer AI applications.

AI, akin to any emergent technology, necessitates judicious regulation, particularly concerning aspects of security, vulnerability, and fairness. It is crucial to acknowledge that not all AI technologies are identical; thus, legislative measures should be tailored to reflect the diverse nature and applications of AI technologies. This approach ensures that regulations are

appropriately calibrated to the specific characteristics and implications of different AI deployments.

The Honorable Debbie Dingell

1. As a Co-Chair of the Congressional 5G and Beyond Caucus, we need to ensure we play a strong role in leading on wireless standards, both domestically and internationally. AI can help with that. AI has the potential to enhance 5G networks by bolstering network security, increasing network efficiency, improving overall quality, and streamlining deployment. Dr. Yamany, can you go into more detail on how AI can enhance 5G capabilities?

2. Despite the challenges discussed, artificial intelligence (AI) may be able to offer helpful insight for telecommunications companies and their customers. Dr. Yamany, how will AI impact broadband networks and services?

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2. VIAVI's integration of Telco-AI into its product suite enhances the performance and quality monitoring of broadband networks. This is achieved through intelligent data collection at endpoints, where strategic decisions are made regarding the nature, volume, and frequency of data collection. Post-collection, these products assist in identifying performance and quality chokepoints, employing AI algorithms to flag potential issues for in-depth analysis by human experts. Furthermore, VIAVI's Telco-AI enabled products offer enhanced monitoring capabilities for Broadband Equity, Access, and Deployment (BEAD) networks. This involves leveraging AI to swiftly detect anomalies, accurately locate the issue, determine the technical cause, and suggest remedial actions to restore service. As broadband deployment expands, aiming to bridge digital divides, it is imperative for broadband providers to utilize advanced Telco-AI testing and optimization solutions. These tools not only monitor and optimize network performance and quality but also contribute to reducing the time required to resolve network issues, thereby maintaining high service standards.