

assessment for fiberoptic technology for security and countering extremist threats

The use of fiber optics in the assessment, identification, and location of security or extremist threats is a giant leap forward in this very important and continuously growing area of concern. The examination of the Fiber Optic Ring Interferometer (FoRI) system shows capabilities beyond what is commercially available today, with significantly fewer disturbance points at a cost that makes the FoRI system more competitive than other options on the market today. The FoRI systems are relatively inexpensive and on par with the cost of other security systems, like those based on a network of cameras and other wired sensors. Most importantly, FoRI doesn't need copper wiring and local power sources that are susceptible to electromagnetic interference, ground loops, lightning, and electrostatic discharge. In addition, optical fiber cables and sensors are intrinsically safe in hazardous environments and eliminate the possibility of electrical shock hazards, especially in medical applications.

The FoRI system, deployed as an Intrusion Detection or Perimeter Monitoring system, is particularly attractive for small and medium-sized objects, infrastructures, or fields because of its cost/performance ratio when compared with high-end military-grade DAS systems. The biggest advantage of FoRI over other solutions is the low requirement for computing resources and very low energy consumption, allowing for deployment of battery-powered Head Units.

Put into practice, the FoRI system can be installed underneath the exterior and interior, and within a structure to provide not only notification of potential intrusions or threats but also the location of those threats and their movement within a given structure. Unlike other detection systems, the FoRI system is not susceptible to interference from electromagnetic discharges or lightning, as there is no copper wiring within the fiber optic system. For effective perimeter security, the FoRI system can be installed in concentric rings or as rays stretching out from the center of the space to provide 360-degree coverage that is not impacted by weather, wind, sand, or other elements that can render more conventional systems deaf and/or blind. The applications for such a system are numerous and include not only security for large venues and resorts, but also superior awareness on large or small estates, for embassies, for power stations, and for various military installations in the CONUS and OCONUS, including Forward Operating Bases (FOBs).

The FoRI system can be installed underground, including within concrete, in the open as in along a fence or within an open roof structure like you might find in a stadium or convention space. It can be placed within walls to allow for continuous threat tracking and location. The location ability of the system not only allows for tracking of individuals, but the identification of sounds associated with threats (e.g., explosions or gunshots, to name a few). Other threat detection capabilities include the ability to differentiate between foot/bike traffic and that of vehicles. This capability is important in areas that are closed to vehicle traffic in detecting extremist threats where vehicles are used as VBIEDs or the vehicles themselves are used as weapons, as in the Bastille Day truck attack in Nice, France, that killed 86 and injured 434. The ability to identify and respond to these types of threats in real time is essential to the enhanced safety of the people.



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The FoRI system's ability to locate threats acoustically, like gunshots or explosions, makes it possible for security personnel and/or law enforcement to deploy their resources on a timely and more effective basis, rather than relying on visual assessment of the threat environment. In these situations, speed saves lives. Consider the value of such a capability in situations like the Las Vegas mass shooting in October 2017, when the shooter was able to fire over 1,000 rounds into a music festival, killing 60 and wounding 413, making it the deadliest single-gunman mass shooting in U.S. history, and it took an hour to locate the shooter and breach his room. Similarly, understanding the location of multiple bombers/shooters at a venue can greatly enhance the response capability. The 2015 soccer stadium bombing in Paris, where three suicide bombers attacked and then others, using guns, began attacking people in cafes, bars, and in the Bataclan concert hall, resulted in 130 fatalities. Again, real-time location and response are crucial in these situations.

It must be noted that what differentiates the FoRI from other traditional systems is the ability of the FoRI system to transmit its data at the speed of light. Fiber optic cable is not susceptible to the lags that can be experienced in wired or wireless systems and is not vulnerable to the external disturbances and disruptions mentioned earlier. Cameras can be blinded by rain, snow, or sand. Sensors can be impacted by weather, animals, or debris. The FoRI system does not suffer from these vulnerabilities. The ability of the FoRI system to provide reliable and highly specific data, in real time, makes it a game-changer in the realms of perimeter/interior security, and as a threat detection/mitigation tool.

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