Wireless Cyber Capabilities Group (QKW)

Tactical Advantage Through Wireless Protocol Expertise

WHO WE ARE

The Wireless Cyber Capabilities Group (QKW) is a team of electrical and computer engineers with an inventive streak. We focus on providing the U.S. military and intelligence communities with operational advantages by leveraging machine learning, software-defined radios, and protocol reverse engineering to develop advanced capabilities for research and operational prototypes. Our engineers apply cutting-edge research to some of our government's most critical challenges.

WHAT WE DO

We seek to give our nation a significant advantage by controlling the wireless communications environment. We understand sponsor needs, research new technologies, prototype systems, and transition solutions to tactical operations.

FOCUS AREAS

» **Signals Intelligence**

» **Wireless Cyber Access**

» **Resilient Communications**

OUR RESEARCH

RADIO FREQUENCY MACHINE LEARNING

Artificial intelligence and deep learning are enabling game-changing technologies from self-driving vehicles to real-time language translation. We believe deep neural networks will enable game-changing capabilities in future radio frequency (RF) communication systems, including automated detection, classification, decision-making, and engagement in the RF domain. We apply our expertise in deep learning to devise novel solutions to complex RF and wireless communications problems that are too expensive or intractable using conventional approaches.

21-03825 3-10-23

WIRELESS CYBERSECURITY

The wireless communications market grew by leaps and bounds over the past decade. The mobile phone is now a critical entryway to commerce, social life, and work for billions of people. These systems are now a sizable attack surface for criminals and rogue states. We leverage our deep knowledge of wireless protocols to develop new and innovative approaches to secure our nation's communications against on-network and off-network attacks.

RESILIENT TACTICAL COMMUNICATIONS

U.S. forces operate in increasingly challenging environments against ever-more-capable opponents. New systems that enable forces to fight through electronic attack and ubiquitous surveillance to achieve a decisive advantage are crucial in the future of battle. We draw on our mastery of wireless networking and waveform design to fortify existing systems and design new systems that will enable robust, adaptable tactical communications.

WIRELESS COMMUNICATIONS LAB

The Wireless Communications Lab (WCL) is a collaborative space enabling the development of innovative solutions for the control of the wireless communications environment. The lab leverages a broad range of expertise in modeling and simulation, rapid prototyping, end-to-end network analysis, and wireless exploitation to advance the state of the art in electromagnetic maneuverability, network intelligence, and wireless protocol security. The WCL provides a host of specialized facilities and RF test equipment, including two large RF shield rooms, a demonstration area, and a special projects area for segregating sensitive work from other projects.

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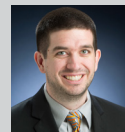
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