Holcombe Department of Electrical and Computer Engineering Seminar Series

Security and Enforcement in Dynamic Spectrum Sharing

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Abstract

Fueled by user demands, emerging applications, and advanced technologies, the use of radio spectrum has intensified and expanded enormously in the last two decades. As the demand for spectrum continues to skyrocket, it will become increasingly difficult, if not impossible, to meet that demand through the legacy spectrum policy based on the assignment of siloed, exclusive-use spectrum bands to particular applications. Consequently, both incumbent users (IUs), who want to maintain access to their spectrum, and secondary entrant users (SUs), who seek access to more spectrum, will, by necessity, need to share the spectrum by embracing efficient, flexible, and agile spectrum sharing technologies. When different stakeholders share a common resource, such as the case in spectrum sharing, security and enforcement become critical considerations that affect the welfare of all stakeholders. Recent advances in radio spectrum access technologies have made spectrum sharing a viable option for significantly improving spectrum utilization efficiency. However, those technologies have also contributed to exacerbating the difficult problems of security and enforcement. In this presentation, I will review some of the critical enforcement and security threats that impact spectrum sharing, with a particular focus on challenges related to ex post enforcement. I will also provide a brief overview of the ongoing spectrum reform efforts in the U.S.

Biography of Speaker

Jerry Park received his Ph.D. degree in Electrical and Computer Engineering from Purdue University in 2003. He is currently a Professor in the Department of Electrical and Computer Engineering at Virginia Tech and the Site Director of an NSF Industry-University Cooperative Research Center (I-UCRC) called Broadband Wireless Access & Applications Center (BWAC). Park is also an Executive Committee Member of the National Spectrum Consortium (NSC). NSC is a large consortium of wireless industry stakeholders and universities collaborating with multiple federal government agencies through a $1.25 billion agreement to support and promote the development of advanced spectrum access technologies. The Executive Committee is the NSC leadership and governance body authorized to oversee the activities of the Consortium. He is also the Associate Director of Industrial Affiliate Relations of the Wireless @ Virginia Tech research group, which is one of the largest wireless research groups in academia. Park was recently elected to serve as the Steering Committee Chair of the IEEE Int'l Symposium on Dynamic Spectrum Access Networks (DySPAN). Park's research interests include dynamic spectrum sharing, wireless security and privacy, applied cryptography, IoT applications, and spectrum regulatory policies. Current or recent research sponsors include the NSF, National Institutes of Health (NIH), DARPA, Army Research Office (ARO), Office of Naval Research (ONR), and several industry sponsors. Park is a recipient of a 2017 Virginia Tech College of Engineering Dean's Award for Research Excellence, a 2015 Cisco Faculty Research Award, a 2014 Virginia Tech College of Engineering Faculty Fellow Award, a 2008 NSF Faculty Early Career Development (CAREER) Award, a 2008 Hoeber Excellence in Research Award, and a 1998 AT&T Leadership Award. He is currently serving on the editorial boards of the IEEE Transactions on Wireless Communications, IEEE Transactions on Mobile Computing, and the IEEE/KICS Journal of Communications and Networks. Park is actively involved in the organization of a number of flagship conferences. Park is an IEEE Fellow.