

Photo



Prof. Yingtao Niu,

**The Sixty-Third Research Institute of National University of Defense Technology,
China**

Bio: Yingtao Niu received the Ph.D. degree from the Institute of Communication Engineering, PLA University of Science and Technology, China, in 2008. He is currently an Associate Research Fellow with the Sixty-Third Research Institute, National University of Defense Technology (NUDT), Nanjing, China. His main research interests include spread-spectrum communication, cognitive radio theory and techniques, with particular emphasis on algorithms of wireless communication signal processing and intelligent algorithm in cognitive radio systems.

Speech Title: Anti-jamming Communication Architecture Inspired by Immunology

Speech Abstract: As wireless communication relies on electromagnetic waves for information propagation, its transmission channel is inherently vulnerable to intentional jamming or unintentional interference. Faced variety of known or unknown jamming or interference, wireless communication system calls widely applicable, efficient, and accurate anti-jamming communication architecture. Therefore, based on the human immune defense mechanism, an anti-jamming communication architecture inspired by immunology is introduced, which is constructed with both general anti-jamming and precise targeted anti-jamming functions. Secondly, based on the auto-stabilization control mechanism of humoral immunity, a continuous time-domain nonlinear generalized anti-jamming control model is established, and an anti-jamming control method is proposed to realize the general anti-jamming under unknown jamming environment based on a non-linear disturbance observer. Finally, based on the two-immune-response specificity immune mechanism, a strategy learning and jamming vaccine generation method for the first-sight jamming's memory and a knowledge-map based anti-jamming scheme for the second-sight jamming are proposed.