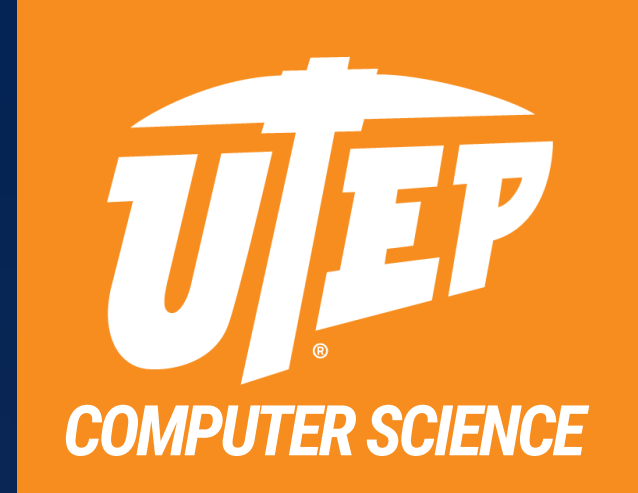# Research Talk

Fabrice MVAH

FlipPath Game to Counter Stealthy Attacks in SDN-Based Tactical Networks

May 10, 2024 @10:30 am to 11:30 am

virtual   MS Teams will be provided

Abstract: Software-Defined Networking (SDN) is an evolving network paradigm that separates the control and forwarding functions of network devices. Its application in tactical networks can help to automate virtual private network establishments, unit task reorganization, security certificate management, and security solution automation. Despite these advantages, tactical networks continue to face new threats. In this work, we introduce a new stealthy packet-dropping scenario that can appear during data forwarding in tactical networks. To overcome this attack scenario, we propose a new game-theoretic approach called FlipPath to provide an optimal data forwarding strategy that prevents packet-dropping on a network path. The forwarding path is considered a shared resource, and each player wants to control it for a long period while minimizing the related costs. We use periodic strategies to characterize the Nash equilibria that identify the defender's optimal data-forwarding strategies. As the defender plays periodically, we use cyber deception to motivate the attacker to maintain its periodic strategy by making it believe that its attacks were successful. Our computational results have shown that the defender who adopts the proposed methodology can mitigate the attacker's stealthy packet-dropping.

Bio: Fabrice Mvah is a Ph.D. candidate at the Department of Mathematics and Computer Science of University of Dschang, Cameroon. His doctoral research is funded by a scholarship from the US Army Research Laboratory under ARL-Africa, an initiative to increase research collaboration between the US Army Research Laboratory and universities in Africa. He has co-authored 5 scientific papers in top tier journals and conferences such as GameSec, EEE ICNC, COSE, J Hardw Syst Secur, and Int. J. Inf. Secur.

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