

CT Advanced Computing Center (CACC) Security Seminar Series 2022-2023

Speaker: Timothy Curry/ **Authors:** Gabriel De Pace, Benjamin Fuller, Laurent Michel, and Yan Sun

Date: Wednesday, November 9, 2022

Time: 12 - 1:30pm

Location: ITE 401

Remote Access: <https://uconn-cmr.webex.com/uconn-cmr/j.php?MTID=m73c0297c4b97a4cf831fa2446f366ec2>

Meeting Number: 2622 501 1527

Meeting Password: QuxMdeuY823

DUELMIPs: Optimizing SDN Functionality and Security

Software defined networks (SDNs) define a programmable network fabric that can be reconfigured to respect global networks properties. Securing against adversaries who try to exploit the network is an objective that conflicts with providing functionality. This paper proposes a two-stage mixed-integer programming framework. The first stage automates routing decisions for the flows to be carried by the network while maximizing readability and ease of use for network engineers. The second stage is meant to quickly respond to security breaches to automatically decide on network counter-measures to block the detected adversary. Both stages are computationally challenging and the security stage leverages large neighborhood search to quickly deliver effective response strategies. The approach is evaluated on synthetic networks of various sizes and shown to be effective for both its functional and security objectives.