



Graduate Seminar (EEL 6936)
Department of Electrical Engineering
http://ee.eng.usf.edu/Grad_Seminar

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Center for Urban Transportation Research (CUTR) Room 202

Joint Routing and Placement of Virtual Network Functions

Abstract

Network Function Virtualization (NFV) and Software-Defined Networking (SDN) are two paradigms that have attracted much attention in the networking field. The first permits the implementation of Network Functions (NFs), such as firewall, access-control list, flow monitoring, on commodity servers located in datacenters. The second facilitates the management and routing of network flows by controllers that are able to program forwarding devices. While recent work has mostly explored the use of NFV and SDN with the goal of minimizing the resources to satisfy a set of requested NFs, the application of these two paradigms has not been studied in scenarios where resources are limited. Those scenarios are typical when parts of the network or datacenters fail. This presentation discusses an optimization scheme based on integer linear programming (ILP) for the joint routing and placement of virtual NFs problem. Given a set of requests, each consisting of NFs and end points of the traffic flow, the objective of the scheme is the maximization of the number of NFs satisfied. At the same, the scheme minimizes both the routing and infrastructure costs to satisfy the requests. While numerical results demonstrate that the proposed ILP can be used in small/medium-sized networks, the presentation also discusses a low-complexity heuristic greedy approach amenable for large networks.



Biography

Dr. Jorge Crichigno received his PhD degree in Electrical and Computer Engineering from the University of New Mexico, Albuquerque in 2009. He is currently an Associate Professor and Director of the Information Engineering Technology (IET) program in the Engineering Department at Northern New Mexico College (NNMC). Dr. Crichigno has served as a Principal and Co-Principal investigator of multiple projects funded by the National Science Foundation (NSF). He is an active member of the American Society for Engineering Education (ASEE) and IEEE society. He has been an ABET Program Evaluator since 2014. Dr. Crichigno has served as a reviewer and technical program committee member of IEEE conferences and journals, and as panelist for multiple NSF programs.