Networking Specialization Overview

Prof. Geoffrey Xie
xie@nps.edu, GE-125
07 Aug 2017
http://faculty.nps.edu/xie/
Networking Faculty Members

- **Geoff Xie, PhD** (xie@nps.edu)
  - Network design, network management, software defined networks, cloud security, intrusion detection, tactical networks

- **Rob Beverly, PhD** (rbeverly@nps.edu)
  - Network and systems architecture, large-scale traffic analysis, Internet measurement, network defense by deception, IPv6 (https://www.cmand.org)

- **Justin Rohrer, PhD** (jprohrer@nps.edu)
  - Resilient and disruption tolerant networks, airborne networks, GENI (Global Environment for Network Innovation)

- **Dennis Volpano, PhD** (volpano@nps.edu)
  - Software defined networks, network modeling, security
Networking Courses

- **CS 3502: Introduction to Computer Networks**
  - part of CS core matrix

- **CS 4552: Network Design and Programming**
  - hands-on experience of building and administrating network protocols and services

- **CS4554: Network Modeling and Analysis**
  - how to model and evaluate performance of networks

- **CS4558: Network Traffic Analysis**
  - applied large-scale analysis, inference, and characterization of network traffic for engineering, security, policy, and optimization

- **Tactical Networking** (in development)
Recent Student Publications


- Fortner, Xie, “DSSR: Balancing Semantics and Speed Requirements in Packet Trace Replay,” *Proc. IEEE International Conference on Communications*, Paris, France, May 2017 (Received Best Paper award)


Two thesis topics currently offered by Prof. Xie

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Topic 1: Software Defined Networks

- How to leverage this technology for designing and managing tactical and datacenter networks?
  - One ongoing thesis on USMC network design
  - One completed PhD thesis on VM datacenter resource allocation
  - Specific topics:
    - (1) Design of naval tactical networks
    - (2) Coordination of a confederation of SDN networks
      the so-called East-West interface problem
Topic 2: Swarm networking protocols

• How to increase the reliability and reduce the latency of data communication between platforms (ground station and aircrafts)?
  ➢ Leverage real-world experiments conducted by NPS researchers
  ➢ Specific topics:

(1) How to minimize and manage link layer collisions?

(2) How to leverage the emergent multipath transport protocols (MP-TCP/MP-UDP)?