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On the Science of Networks – An Emerging Approach

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Abstract

Over the course of the past several years, the U.S. military has openly embraced the tenets of the Network Centric Warfare (NCW) and Network Centric Operations (NCO) paradigms. However, understanding the multiple facets of networking remains incomplete. The intent of this paper is to discuss the background, direction, and benefits provided by the Net-Centric approach and describe its transition to a new evolutionary state known as *Network Science.* Based on the research Study recently completed by the National Research Council on behalf of the Board on Army Science and Technology, Network Science examines the organized knowledge of networks by utilization of a scientific method. Capitalizing on this approach, a descriptive overview of a Network Science based project as completed by the USMA cadets will be provided along with the results ascertained to include relevant domain (e.g., social, biological, physical, etc) area infusion, a description of the data as collected, the analysis performed, along with the validation methods that were utilized in accordance with the tenets of Network Science as defined.

Index Terms: Network Science, Random nets, graph distribution, social, mathematical and behavioral networking.