NETWORK SIMULATORS AND AUGMENTED REALITY TECHNIQUES TO SUPPORT NETWORK OPERATIONS (NETOPS) IN A CLOUD COMPUTING ENVIRONMENT

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ABSTRACT

This research aims to demonstrate the capability of mobile devices, like ruggedized COTS (Commercial Of The Shelf) smart phones or tablets, equipped with Augmented Reality (AR) applications to support network operations (NETOPS) both in a military or civil environment.

The authors start their research from the military application of Modeling & Simulations technology to support operational planning in the S(pecialist)/G(round)/J(oint) 6 branches. Taking the latest tools and applications available from the market into consideration, these can be implemented using Network Simulators for monitoring the planned networks, before and after being put in place, across the Command and Control Value Chain.

This research takes into consideration the opportunities to provide C4IS (Command control Communication Computer and Information Systems) operators with tools able to improve their communication awareness in a network centric or network enabled capabilities environment. The authors, with the stimulus of the human visual sense via Augmented Reality techniques, want to demonstrate how AR applications and Network Simulators can support NETOPS monitoring and management needs. The authors provide a use case where AR technology and techniques can be used to visualize virtual objects, like communication nodes, superimposed to the real world, with the possibility to visualize in an interactive manner operational data regarding the network status, coverage, bandwidth, cyber attacks and so on.

Moreover, the authors want to prove that using a cloud Infrastructure-as-a-service (Iaas) can improve the overall efficiency, cut operational costs and increase cyber defense situational awareness. In particular, cyber defense picture could be built by fusing data from multiple sensors in cyberspace and trying to predict the outcome.

The adoption of Cloud Computing technology constitutes an area of innovation and development of what authors are doing as primary research. The main idea is to run the Network Simulator as a Service of a Cloud Computing Platform in order to improve scalability, flexibility deployment and development, resilience and reliability. Furthermore main benefits will be Scalability, Flexibility, Resilience and Reliability.

REFERENCES