The Weapon Combat Effectiveness (WCE) analytics is very expensive, time-consuming, and dangerous in the real world because we have to create data from the real operations with a lot of people and weapons in the actual environment. The Modeling and Simulation (M&S) of many techniques are used for overcoming these limitations. Although the era of big data has emerged and achieved a great deal of success in a variety of fields, most WCE research using the Defense Modeling and Simulation (DM&S) techniques were studied without the help of big data technologies and techniques. The existing research has not considered various factors affecting WCE. This is because current research has been restricted by only using constructive simulation, a single weapon system, and limited scenarios. Therefore, the WCE analytics using existing methodologies have also incorporated the same limitations, and therefore, cannot help but get biased results.

To solve the above problem, this dissertation is to initially review and compose the basic knowledge for the new WCE analytics methodology using big data and DM&S to further serve as the stepping-stone of the future research for the interested researchers. Also, this dissertation presents the new methodology on WCE analytics using big data generated by Live, Virtual, or/and Constructive (LVC) simulations. This methodology can increase the fidelity of WCE analytics results by considering various factors. It can give opportunities for application of weapon acquisition, operations analytics and plan, and objective level development on each training factor for the weapon operators according to the selection of Measures of Effectiveness (MOEs) and Measures of Performance (MOPs), or impact factors, based on the analytics goal.

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The public is welcome to attend.