INTERFACING A GEO-DATABASE AND A TRAINING SCENARIO LIBRARY FOR AN ONLINE SCENARIO DATABASE ACCESSIBLE TO DEFENSE SIMULATORS

Nirut Chalainanont*, Chamnan Kumsap and Worakhong Meekhla
Defense Technology Institute (Public Organization)
47/433, 4th Floor Changwattana Road, Pakkred, Nonthaburi 11120, Thailand
*Email:nirut.c@dti.or.th – corresponding author

ABSTRACT: A training scenario library is a physical depository where texts and told stories of military doctrine and lesson plans are visually constructed to convey an abstract experience through a concrete visual and audio simulation and pass on to next generations of defense officers. An ideal approach is to provide defense clients with all-time access to the library from which the needed training scenario is selected and placed on the training scene in form of a computer-generated virtual world. This paper explains an interface between the geo-database that defense clients can access through Google Maps/Earth tool on their site and the scenario library accessed via a scenario selector that will select and load the scenario for rendering on their simulators. This approach requires a scenario database design and concept to collect 3D assets that will be populated in the selected terrain and artificial intelligence that is needed to create character and vehicle behavior and training waypoints and paths. The user sites are equipped with a graphical user interface for further customization of the loaded scenario before launching in the simulator. Simulation of the proposed interface was conducted and reported in the result and discussion section. Actual implementation in the field where on-site clients access the interface for mission composition and editor was scheduled to appear on further studies and believed to be the core scenario database that shapes the way military doctrine and lesson plans are handled.

1. INTRODUCTION

The concept of geo-database has been exploited to collect imagery, GIS data layers and terrain elevation data for the purpose of military simulation and training. The GIS capabilities were reported to win the heart and mind of military officers in a virtual small-arms simulator (Kumsap et al., 2013). The first effort in Thailand's Ministry of Defense to make use of the database in the arrangement of the selected models was through the approach of geo-computation for automatic placement of 3D building models (Kumsap et al., 2014). The database itself was manipulated in support of the automatic placement of 3D building models to a simulated scene aimed specifically for military simulation (Tanvilaipong et al., 2015). All those studies focused mainly on geo-specific location or area where the specific and geographic extent was selected for scene rendering that formed an essential part of simulating the real world to the virtual one. A spatially scattered collection of selected sites for training is visually present on a map server side but a training scenario library is a physical depositor that formulates texts and told stories of military doctrine and lesson plans to a more visually constructed message. That works around the concept that tries to convey an abstract experience through a concrete visual and audio simulation and to pass on to next generations of defense officers. When run in form of video, the training scenario yields less perception of where the scenarios take place. Thus, the approach of interfacing the geo-database and the training scenario library to make it easier for the defense simulators to access a scenario database is introduced in this paper as another important part of the recently implemented high level architecture (Kumsap et al., 2013) for the information exchange of the integrated modeling and simulation.

Terrain visualization was used as an alternative to pure terrain analysis (Swan, 1999). It was a proven tool to add interpretability to the decision making executive of military missions. The paper (Kamel Boulos, 2004) used GIS method to illustrate practical, real-world scenarios to improve community health and healthcare practices, e.g., for improving hospital bed availability, in community health and bioterrorism surveillance services, and in the latest SARS outbreak. The study in (Zerger and Smith, 2003) focused on observations from a real-time emergency management disaster scenario held in Mackay in far north Queensland, Australia to examine non-technical GIS impediments including custodianship and system implementation for disaster risk management. Findings have shown that the use of GIS for urban disaster risk management can readily fail due to implementation, user access and knowledge impediments, in addition to the availability of spatial data and models. It was boldly stated in (Smelik et al., 2010) that military training instructors increasingly often employ computer games to train soldiers in all sorts of skills and tactics. Instead of constructing a terrain model using complex modeling tools, the novel way for instructors to model terrain for their training games was presented so that instructors can declare the required