The goal of this research is to build an experimental environment for the Simulation Interoperability Laboratory (SIL) of University of Central Florida (UCF). SIL is researching about multi-resolution modeling (MRM) especially in military field uses. This thesis proposes steps to develop an MRM federation system and build two different MRM systems using COTS simulations (SIMBox, VR-Forces, and MASA Sword). This paper was written to provide the basis for a time-based MRM federation study in the Simulation Interoperability Laboratory.

The work presented describes many definitions and notions related to Multi-Resolution Modeling (MRM) and discusses examples to make better understanding for further researches. MRM is relatively new research, and there are high demands of integrating simulators running as one in the military field. Most military related researches are confidential because they had to use military simulators which military already use it. Hence, there were many limitations to see their process to build MRM system or the results of the research. Therefore, development of MRM federation using COTS simulations can provide many examples of MRM issues for future research.

Keywords: Multi-Resolution Modeling, MRM, aggregation, disaggregation, MRE, MRM approach.