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Intelligent Resource Operational Network (IRON) for Cultural Modeling

Daniel Barber, Denise Nicholson
University of Central Florida, Institute for Simulation and Training
Partnership II Building, 3100 Technology Parkway, Orlando, FL 32826 USA
dbarber@ist.ucf.edu, dnichols@ist.ucf.edu

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1. Introduction

In this poster session, we describe a framework for developing human, social, and cultural behavior models. The goal of this framework is take a hybrid approach to intelligence and behavior modeling. This hybrid model, called the Intelligent Resource Operational Network (IRON), attempts to combine multiple modeling and machine learning resources which include, but are not limited to: rule-based and expert systems, neural networks, genetic algorithms, and cognitive models, etc.

2. Rationale for IRON

Many different methods have been used to model agents and teams that behave closely to how real people behave which can include genetic algorithms (Garfield, et al., 2005), and cognitive models (e.g. Anderson 1993, Hill, et al., 1998, and Morrison 2003). Each method has its strengths, but also come with their own weaknesses such as computational complexity, focus on modeling individuals, inability to learn from interactions with the environment, etc. (National Research Council, 2008).

It is our hypothesis that no single method will address all needs of a system modeling human, social, and cultural behavior. A hybrid approach is proposed that constructs a federation of different modeling techniques linked together in a network. The goal of the network is to balance the strengths and weaknesses of each modeling technique or "Intelligent Resource" so that the best resources are used depending on the end system.

3. IRON Overview

The IRON framework and modeling process being researched will attempt to demonstrate a hybrid modeling approach in the domain of human, social, and cultural behavior (HSCB) modeling. The goal is not to create new intelligent resources, but to develop a matrix of existing techniques which identifies their strengths and weakness in individual, organizational, and societal models. Identifying the linkages between each intelligent resource and their benefits will be described.

Depending on the type of end system, appropriate resources will be selected to define the most capable model. For example, a system modeling an interactive avatar for cultural training may require more resources and HSCB data than a system that only takes in queries and returns appropriate results about a culture.

4. Architecture Design Process

The process for designing the IRON Framework includes three phases. The first phase is to identify cross-cultural competencies for an HSCB framework. This includes knowledge skills, and attitudes (KSAs) , and core cultural focal points. These cultural competencies will help bridge existing HSCB content and guide future data collection. The second phase is to identify existing intelligent resources, their strengths and weaknesses, and how they may be linked together. The final phase is to identify specific use-cases for a training and analysis system, and develop prototype HSCB-IRON models for experimentation and evaluation.

5. References

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Author Biographies

DANIEL BARBER is a full time Researcher and Doctoral Student with the UCF-IST Applied Cognition and Training in Immersive Virtual Environments (ACTIVE) laboratory, which engages in applied research and development for the analysis and improvement of human performance. Mr. Barber conducts applied research in unmanned systems, communication, computer vision, human computer/robot interaction, and interactive simulations. He has over five (5) years experience in developing robotic systems and is Faculty Advisor for the Robotics Club at UCF.

DENISE NICHOLSON, Ph.D. is director of the ACTIVE laboratory. Her research focus on human systems modeling, simulation and training includes virtual reality, human–agent collaboration, and adaptive human systems technologies for Department of Defense applications. She joined the University of Central Florida in 2005 with over 18 years of government service ranging from bench-level research at the Air Force Research Lab to leadership as the Deputy Director for Science and Technology at the U.S. Navy's NAVAIR Training Systems Division.