

Using Human Performance Modeling to Enhance System Design

Full Day Tutorial

Often it is difficult for human factors engineering (HFE) design recommendations to be heard and implemented. The effects of issues associated with human error, mental workload and other HF concerns are difficult to express especially when attempting to persuade those outside of the HF community. Modeling and simulation (M&S) can be an extremely effective tool for conducting analyses and producing quantitative results necessary to more effectively support HFE design recommendations. However, analysis is often separated inappropriately from M&S. M&S alone is insufficient to influence system design. It is necessary to relate HFE issues to overall system performance to influence system design decisions. The objective of this tutorial is to teach interested individuals how they can use analysis based human performance modeling (HPM) to develop quantitative results that will be influential in getting HFE issues addressed to enhance system design.

This analytical approach draws upon the elements of experimental design, the application of human factors principles and the power of M&S to create a method for predicting system performance based on tradeoffs in system design. Through a combination of lecture and hands on activity, tutorial participants will learn how to implement a proven analytical approach to conduct influential HPM analysis. Participants will learn the analysis steps and will apply these in example exercises. Through the hands on activity, they will be exposed to using a human performance modeling tool, the Improved Performance Research Integration Tool (IMPRINT Pro). IMPRINT Pro incorporates the fundamentals of task network modeling with embedded principled models of workload and algorithms that demonstrate the effects of personnel characteristics, training, and environmental stressors to examine a wide range of issues that effect human performance. IMPRINT has been applied to numerous military issues with significant impact; most recently identifying potential problems with mental workload of manned ground vehicles operators in the Future Combat Systems program.

Participants will be provided with a copy of the tutorial Powerpoint slides. For the most interactive experience, each participant should bring their own laptop with IMPRINT Pro already installed¹.

Proposed Agenda

Time	Topic	Instruction
9:00 AM	Welcome and Introductions	Lecture
9:05 AM	Importance of HPM to Good System Design	Lecture
9:15 AM	The Analysis Approach	Lecture
9:25 AM	Analysis Examples	Lecture
9:40 AM	Exploring Issues of Task Time and Accuracy - <i>Reviewing Data Requirements and Building Models</i>	Hands on/Lecture
10:25 AM	BREAK	BREAK
10:35 AM	Exploring Issues of Task Time and Accuracy - <i>Building Models and Running and Analyzing Models</i>	Hands on
11:50 AM	LUNCH	BREAK
12:35 PM	Exploring Issues of Mental Workload - <i>Reviewing Data Requirements and Building Models</i>	Hands on/Lecture
2:05 PM	BREAK	BREAK
2:15 PM	Exploring Issues of Mental Workload (cont.) - <i>Running and Analyzing Models</i>	Hands on
2:45 PM	Future Enhancements	Lecture
2:55 PM	Wrap Up and Q&A	
3:00 PM	Adjourn	BREAK
4:55	HOURS OF INSTRUCTION	
6:00	TOTAL HOURS	

¹ Since IMPRINT distribution is controlled, participants will need to complete required forms in order to receive a copy of the software. Please email imprint-info@arl.army.mil for more information. The necessary forms and CD copies of the software can be provided onsite but participants must have full administrative access on their computer in order to install the software onsite.