Research Task / Overview

This aspect of the RT-137 task leverages the following innovations of Monterey Phoenix Behavior Modeling:

- Behaviors and interactions of the system AND environment are described in one uniform framework
- System interactions among components are specified separately from system behaviors of components
- A library of all possible scenarios (up to a specified scope limit) are generated from the separately specified behaviors and interactions, leveraging the small scope hypothesis that most flaws will be demonstrated on small counterexamples

Data & Analysis

Example: Tee Time System

GoF Courses (1, 1)
- Golf Course List
- Golf Course Details
- Golf Course Descriptions
- Golf Course Ranges
- Golf Course Fees
- Golf Course Costs
- Golf Course Amenities

EE Courses (1, 1)
- Golf Course List
- Golf Course Details
- Golf Course Descriptions
- Golf Course Ranges
- Golf Course Fees
- Golf Course Costs
- Golf Course Amenities

Terminology:
- External Inputs (EI): Data that is entering a system
- External Outputs (EO) and External Inquiries (EQ): Data that is leaving the system
- Internal Logical Files (ILF): Data that is processed and stored within the system
- External Interface Files (EIF): Data that is maintained outside the system but is necessary to satisfy a particular process requirement

Goals & Objectives

- To enable affordability tradeoffs with integrated software-hardware-human factors through Total Ownership Cost (TOC) modeling
- Integrated costing of systems across full lifecycle operations
- Extensions and consolidations for DoD application domains
- Tool interoperability and tailorable (service-oriented)
- To leverage Monterey Phoenix (MP), a system and software architecture and workflow modeling framework based on behavior modeling
- To improve affordability-related decisions across all joint services
- To assess MP for automatically providing cost information from architectural models

Methodology

Apply Function Point (FP) Counting Methodology to Monterey Phoenix (MP) Behavioral Model:

- Identify typical questions to be answered and determine type of count
- Describe system and environment behaviors using MP, and extract Unadjusted FP from the model
- Assess effort using MP-COCOMO II tool, and visualize results in views specific to stakeholders

Future Research

- Refine weights for each Transactional Function
- Refine relationship between steps of a FP Analysis Elementary Process and MP descriptions
  - Nested COORDINATES
  - ILF and EIF behavioral representations in MP
- Apply methodology to ITAP UAV case study and IFPUG case study

Contacts/References

- Monterey Phoenix and Related Work: http://faculty.nps.edu/maugusto
- MP Wiki (including full bibliography): https://wiki.nps.edu/display/MP
- Public MP server with MP editor, trace generator, and trace graph visualization: http://firebird.nps.edu/
- MP COCOMO Tool: http://cse.usc.edu/tools/MP_COCOMO