Enterprise Architecting Tradespace Analysis
SERC-RT-49

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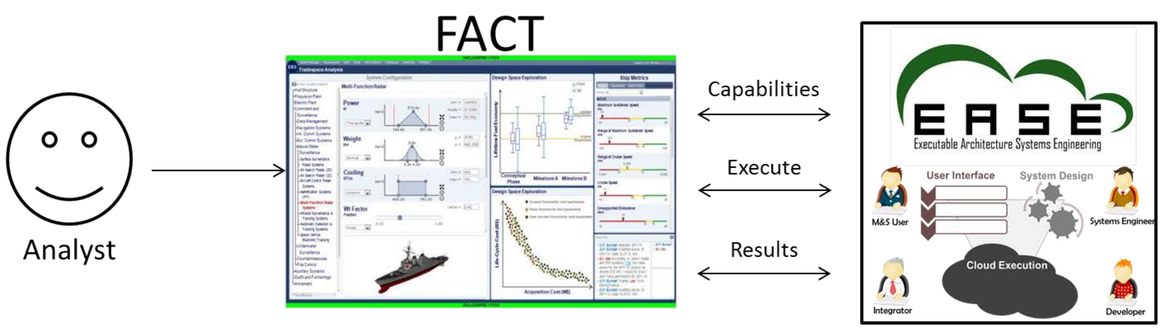
Research Task

- Formulate interface between Georgia Tech Research Institute (GTRI) Web-based Systems Engineering Tradespace Tools (e.g. USMC's Framework for Assessing Cost and Technology, FACT) and Army Research Lab's Executable Architecture Systems Engineering (EASE)
- Integrate with new RESTful API to realize simulation capability execution from existing FACT experience
- Demonstrate capability via Force Protection Use Case

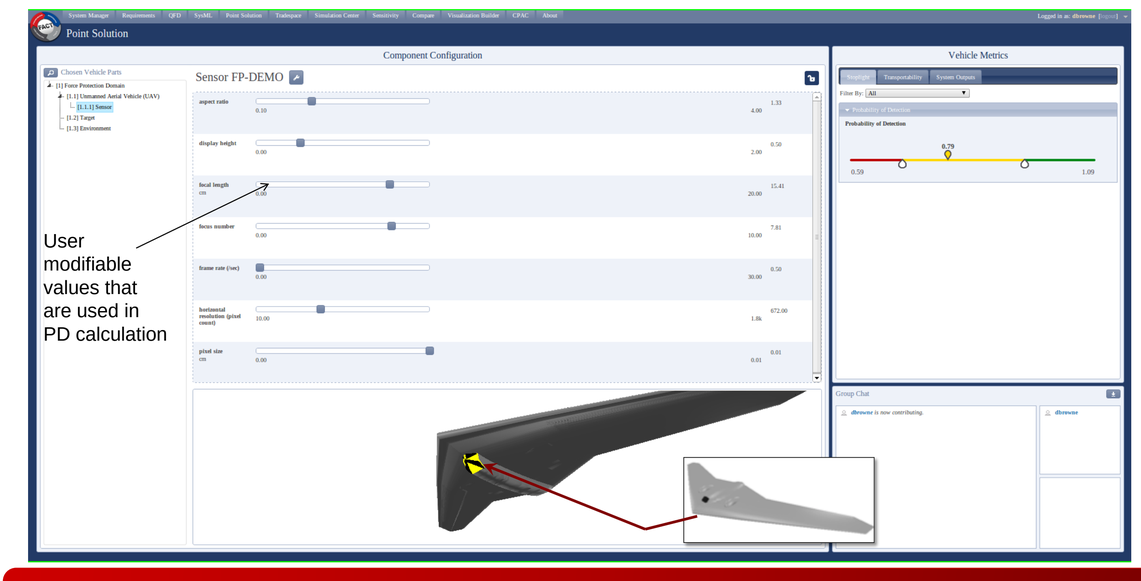


Goals & Objectives

- Lay the groundwork for a future tradespace software architecture to support Engineered Resilient Systems (ERS)
- Improve standardization of method for FACT to integrate with existing, trusted tools
  - Lowers the bar for reuse of Government analysis tools
- Provide a means to execute full simulations which utilize FACT systems
  - Removes the manual process of gathering the necessary data and entering input parameters into a different simulation environment
  - Allows for FACT-hosted models to be executed in order to calculate the parameters for simulations and/or execute FACT-hosted models using simulation outputs as input parameters

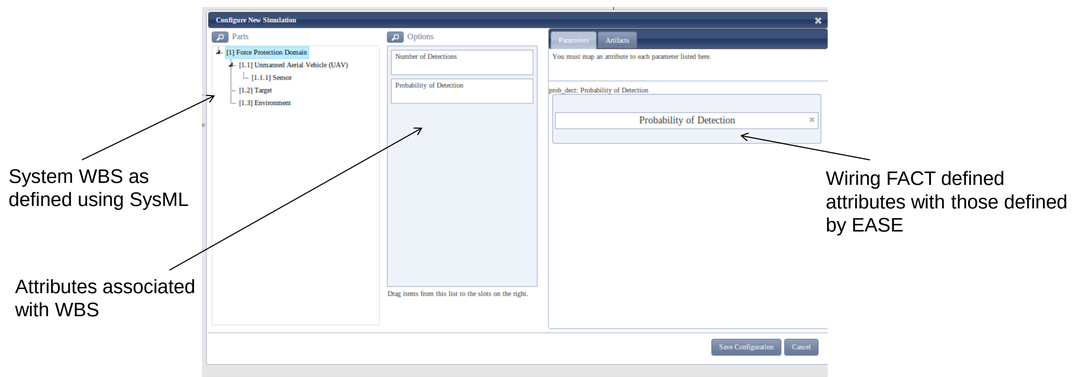
Methodology

- Determine current standard practices for providing access to web-hosted services via API: RESTful, Thrift, etc.
- Explore user interfaces for realizing a specific FACT system link to an available simulation
- Explore discoverability of simulations from FACT via EASE and their available inputs and outputs
- Provide a notional FACT model for calculating Probability of Detection (PD) and provide that value to EASE for passing to the simulation
- Provide a method for users to consume the results of the simulation



Data & Results

- FACT users tweak values related to the simulated UAV and a FACT model calculates a PD based off these values
- PD sent to EASE (via REST API)
- EASE starts a simulation run with the FACT specified PD
- EASE returns URL's for resulting images and number of detections in the simulation run
- These values are displayed to users within FACT



Conclusions

- Successful demonstration of ability to communicate between FACT and EASE using a REST API, showing promise for expansion to other tool integration
- Successful demonstration of extending tradespace analysis and modeling capabilities of FACT with modeling and simulation capabilities in EASE
- Work on this RT will directly applicable to upcoming Engineered Resilient Systems efforts, to be co-developed with the US Army Engineer Research and Development Center (ERDC)
- Shows that capabilities like this can overcome the geographic distribution of assets (FACT in Atlanta and EASE in Orlando during demonstration)

Research Team & Contact Information

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