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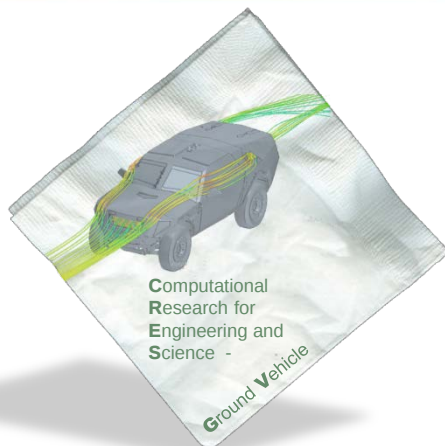
TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

CRES-GV Overview

Computational Research for Engineering and Science — Ground Vehicles

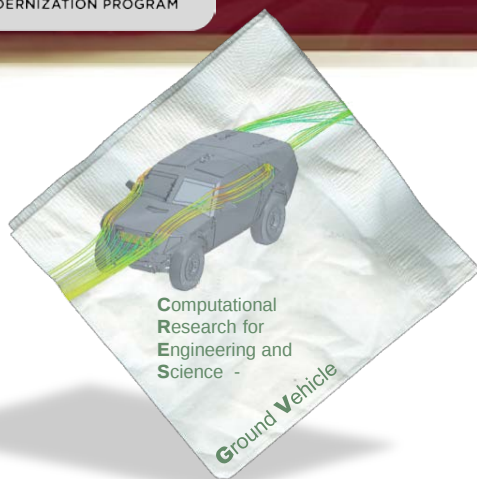
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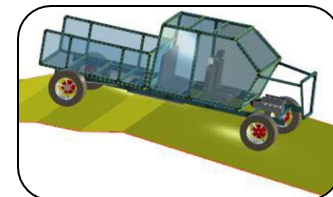
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- New HPCMP project
- **Goal: Physics-based M&S to substantially improve the acquisition process and results**
- HPC = faster design, test, innovation loop
- Accelerate solution exploration
- Eliminate fragile point designs

Preliminary Product Ideas:

1. **Mixed-Fidelity Multidisciplinary Physics Solver Suite**
 - Fast answer with less model preparation.
 - Capable of sustained 72 hour turnaround
2. **Optimization Tool**
 - Focus on robustness optimization, not point solution
3. **High-Level Systems Tradespace Tool**
 - GTRI / Ricardo type tool: "Collaborative Visualization"
4. **Concept Definition Tool**
 - Pre detail-design CAD w/ physics
5. **Improved Soldier-in-the-loop "Try it Before You Buy It"**

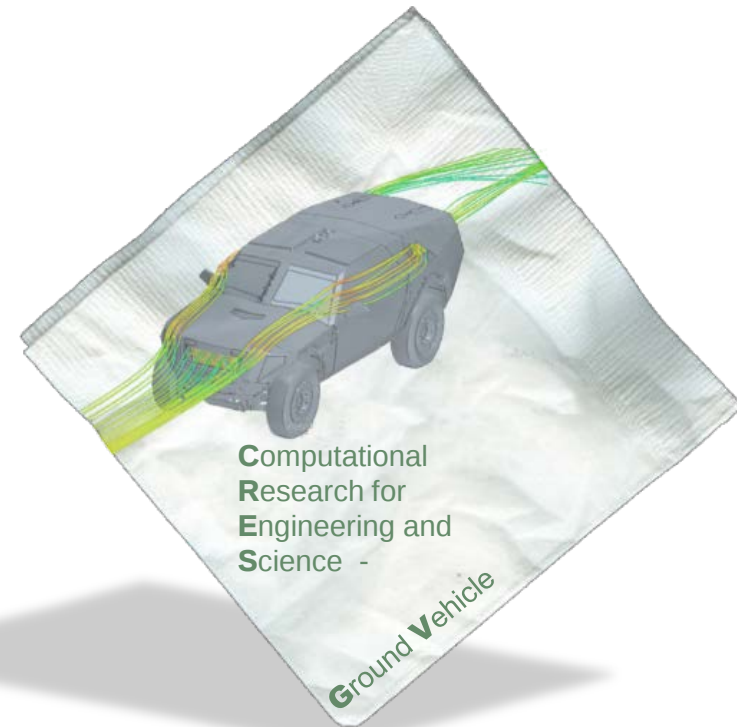


CMTS – Detailed CAD not necessary for up-front design and analysis

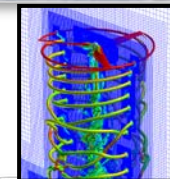


Ride motion simulators greatly enhance soldier-centric design

- HPCMO is the major funding source and proponent
- FY 12 for PM buy-in / initial planning with ERDC
- HPCMO to fund at higher level in out years
 - Contractors to write commercial-quality code
 - Possibly upgrade commercial codes
- Team thus far:
 - TARDEC Lead: Rob Smith
 - ERDC Lead: Randy Jones
 - Dan Kedziorek (HPC)
 - Russ Kouba (Concepts)
 - Pradeep Mendonza (Systems)



- Computational Research and Engineering Acquisition Tools and Environments (**CREATE**) Program
- Air Vehicles (AV)—Air Force, Army & Navy
 - Aerodynamics, structural mechanics, propulsion, control, ...
- Ships—Navy
 - Shock vulnerability, hydrodynamics, concept design
- Radio Frequency (RF) Antennas—Air Force, Army & Navy
 - RF Antenna electromagnetics and integration with platforms
- Mesh and Geometry (MG) Generation
 - Rapid generation of mesh and geometry representations needed by analysis



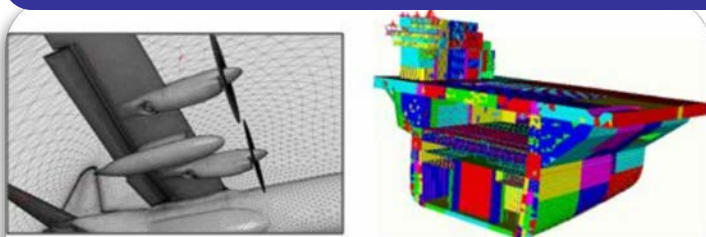
Design concept



Seakeeping and resistance



Shock vulnerability



Aircraft and aircraft carrier meshes



Military platforms with antennas

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

Goal: Knowledge Based Acquisition



Ground Vehicle CRES



ASEC S.E. Tool Captures and Drives Process

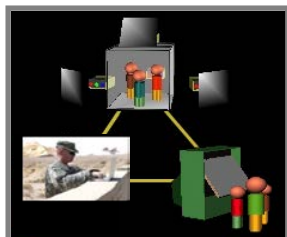


Quick Turnaround
Physics- Based M&S



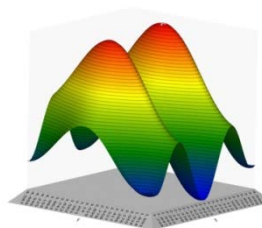
Operational Models
based on accurate data
= Better requirements

Intuitive Concepting / Massive Collaboration



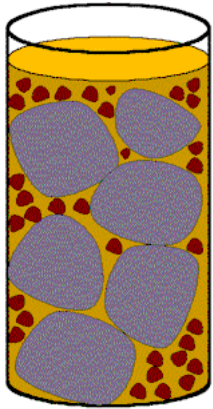
- BETTER Concepting CAD
"3-D Back of the napkin"
- Users co-design with
physics-based feedback

Better Designsapce Exploration



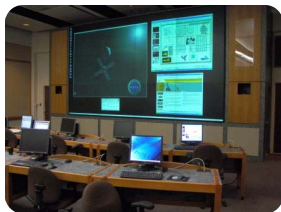
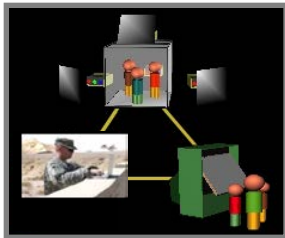
Soldier-in-the-loop - Duty Cycle Characterization - Key to Soldier Centric Design



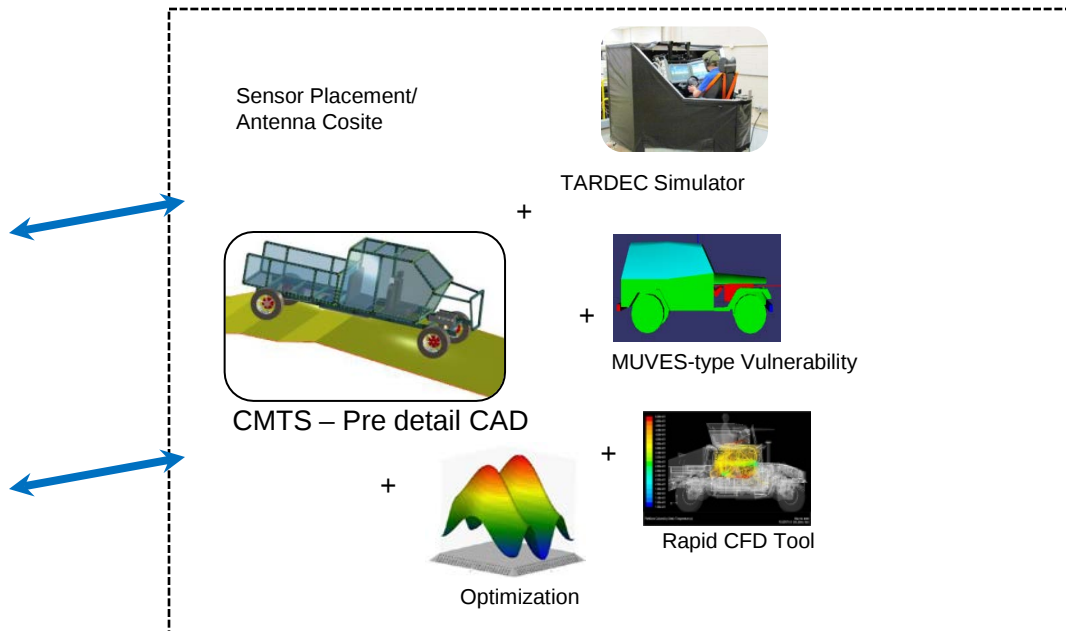


- Powertrain
- Survivability (blast, penetration, MUVES)
- Thermal
- Antenna/ sensor placement / EMI
- Duty cycles/ human factors
- Mobility & Vehicle dynamics (and weapon system)
- Stress / fatigue

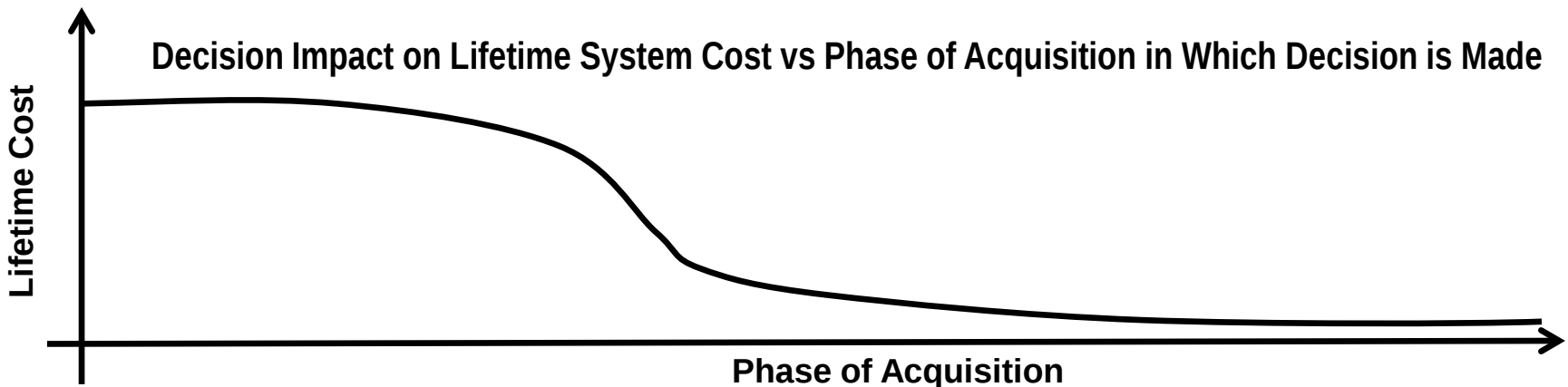
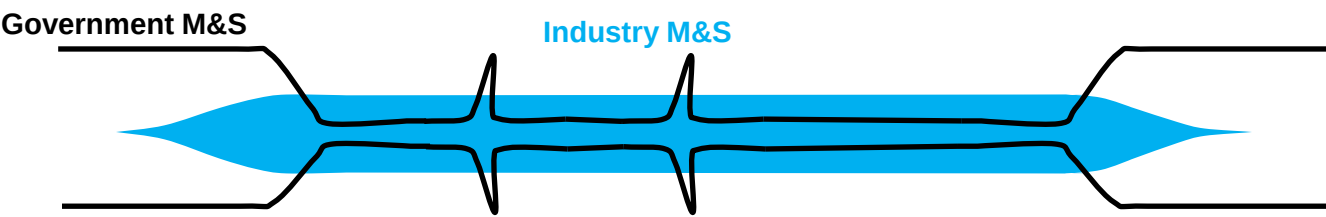
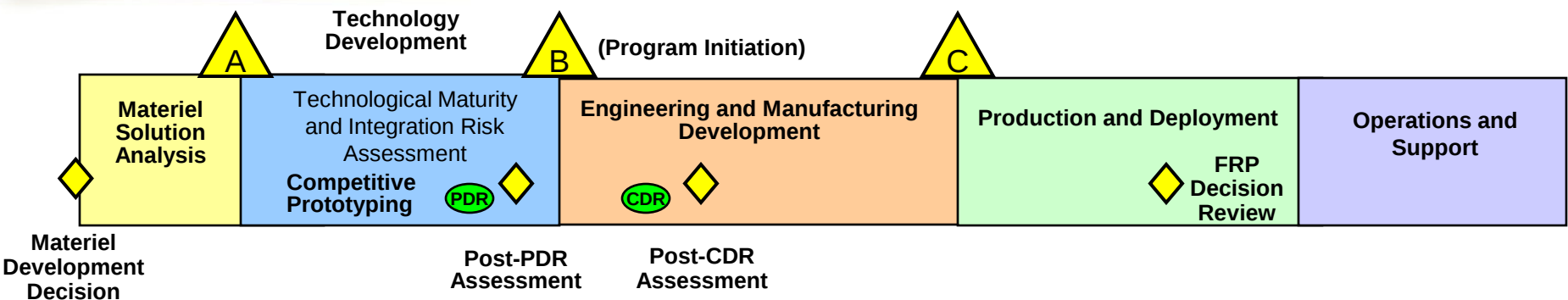
Intuitive Concepting / Massive Collaboration



GTRI COVE



How Address Government vs OEM?



How Address Government vs OEM?

