



Test & Evaluation, Verification & Validation

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Test and Evaluation, Validation and Verification Acquisition and System Development View

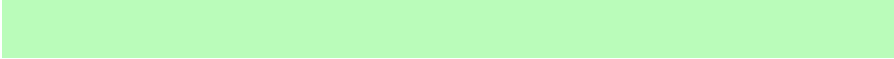


Goals:

- Verifiable requirements specifications:**
 - Verifiable autonomous behaviors and a functional and traceable requirements language for describing them.
- Arguments for dependable autonomy:**
 - Integration of safety, security, and reliability cases based on virtual and physical evidence.
- Instrumented and measured autonomy:**
 - Autonomous systems instrumented for evaluation and methods of measuring human-machine interaction.
- Safe development:**
 - Methods of protecting life and property for agile development with safety critical systems.
- Resources & tools for T&E and V&V of autonomy:**
 - Virtual environments, adversarial testing, robust run-time monitoring, V&V for machine learning data.
- Dynamic assurance for adaptive systems:**
 - Methods for safely deploying adaptive systems.

Central Technical Challenge:

Cradle-to-grave TEV&V involvement to support efficient and effective development, fielding, and sustainment of dependable autonomous systems



Some image

?Lead for Science: TRL 1-4
?Lead for Systems: TRL 4+
?Lead for T&E: Works in T&E, part of AAIT
?3rd Service



Test and Evaluation, Validation and Verification Science & Technology View



Goals:

Verifiable Behaviors:

- Verifiable algorithms for perception, understanding, and planning, capable of online learning, with known performance in different domains.

Design for Assured Autonomy:

- Assured autonomous systems developed by compositional verification, robust run-time monitoring, and methods for assessing overall system assurance.

Autonomy and AI Test Technology:

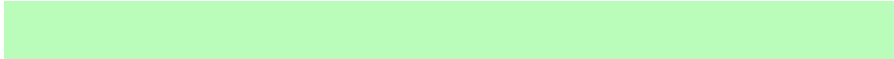
- Combining virtual and physical experimentation to provide instrumentation and testing of autonomous systems and AI.

Dynamic Assurance for Adaptive Autonomy:

- System assurance updated as the system adapts or as the domain changes.

Central Technical Challenge:

Cradle-to-grave TEV&V involvement to support efficient and effective development, fielding, and sustainment of dependable autonomous systems



Some image

?Lead for Science:
 ?Lead for Systems:
 ?Lead for T&E: (works with AAIT)?
 ?3rd Service



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	High Risk. Significant gaps remain
	Addressing technical challenges, risk capability
	Likely capability will be achieved

Hard Problems:

- Verifiable requirements specifications.
 - A
 - B
 - C
- Arguments for dependable autonomy.
 - A
 - B
 - C
- Instrumented and measured autonomy.
 - A
 - B
 - C
- Safe development.
 - A
 - B
 - C
- Resources & tools for T&E and V&V of autonomy.
 - A
 - B
 - C
- Dynamic assurance for adaptive systems.
 - A
 - B
 - C

To be updated