

Adaptive Automated Threat Recognition (AATR)

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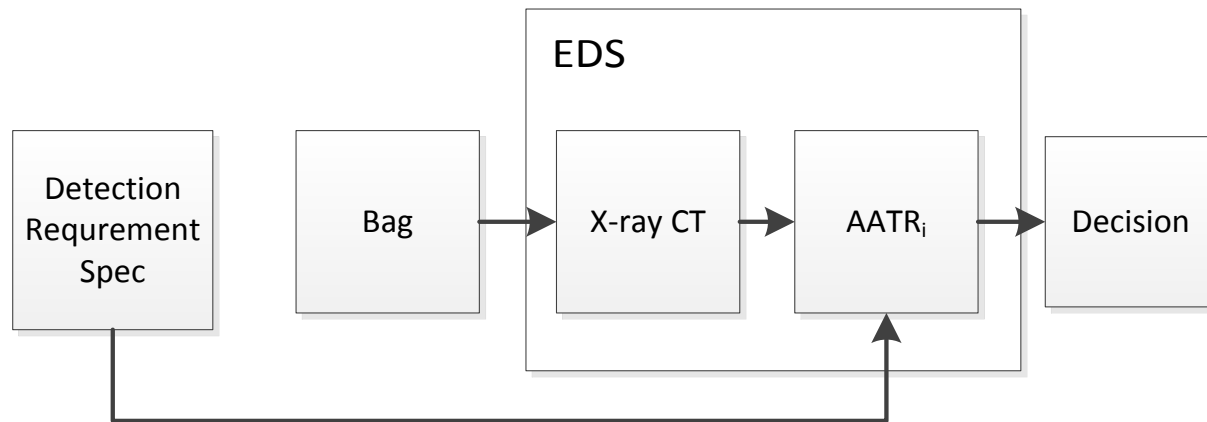
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So What? Who Cares?

- Space: CT-based explosive detection scanners (EDS) with automated threat recognition (ATR)
- Problem: Takes to long to field ATRs based on emerging threats from adapting adversary
- Part of the solution: Adaptive automated threat recognition (AATR); automatically adapt to computer-readable detection requirement specification.
- Status: ALERT & LLNL funded to understand requirements, algorithms and testing scenarios for AATR. Presenting project today to obtain feedback.
- TSA benefit: Faster response to emerging threats, trade PD/PFA, change min mass, min sheet thickness. Applicable to AT2, AIT.

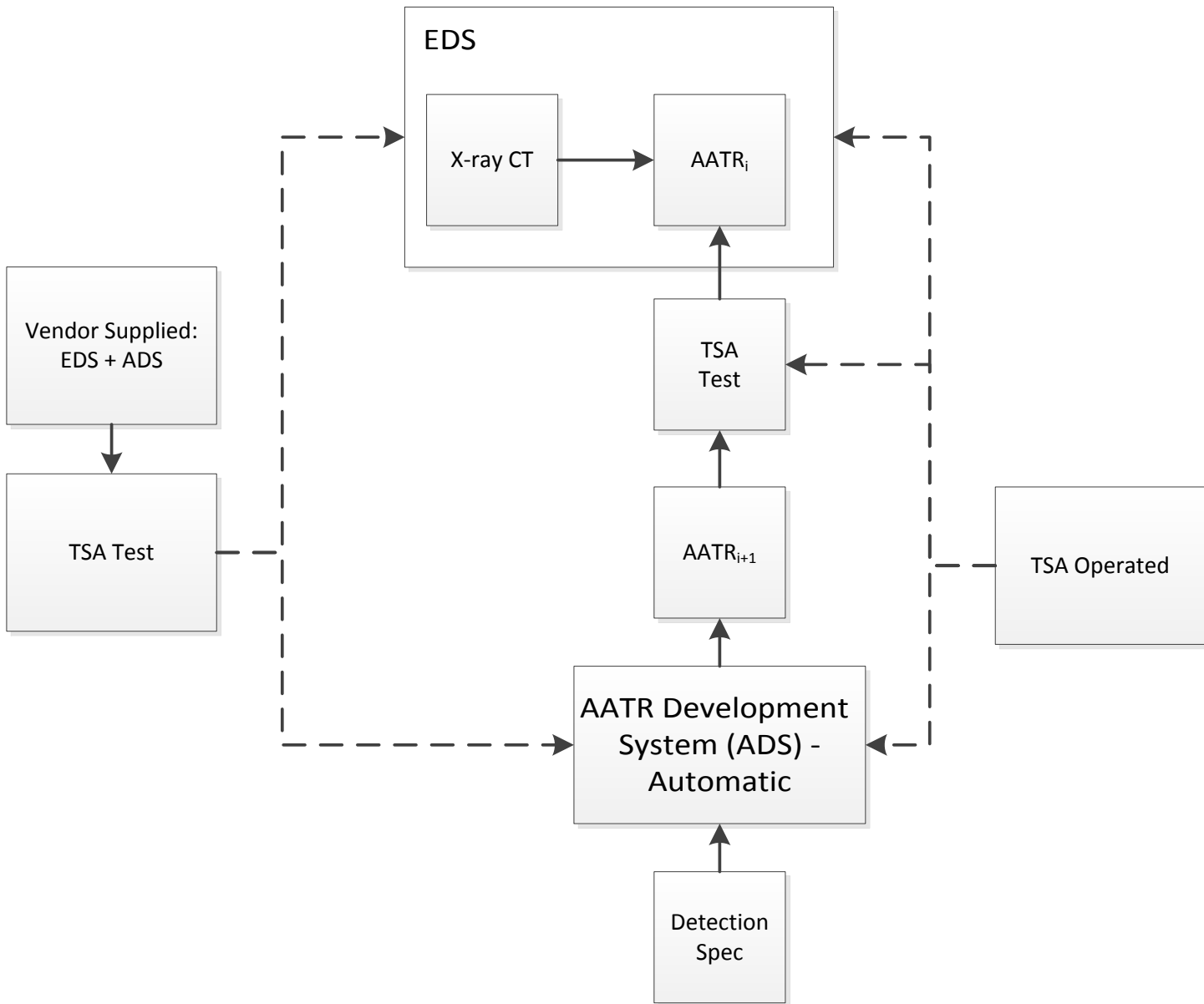


Problem

- Takes too long for TSA to deploy new EDSs with new ATRs (GAO 11-740)
 - Also, inefficient, costly and potentially unsafe
 - Threat may not be relevant at end of process
- Time due to ~30 steps that are required today to evaluate new threats, acquire training data, train ATRs, and deploy new ATRs.
- Goal: 1-day deployment of new ATR after new threat identified

Solution

- Vendors deliver an automated system (or tool, process, denoted AATR) that TSA uses without vendor involvement to create new ATRs.
- ATRs developed without extensive training data and without rigorous TSL testing
 - ATRs can be refined with additional training data and testing
- Hence, time from identification to deployment is reduced
- Approximately 20 of the 30 steps would be reduced if not eliminated



Detection Requirement Spec

- Types of threat classes
- For each class
 - Minimum mass
 - Minimum thickness (sheets only)
 - Density range
 - Coefficient for calculating weighted PD
 - PD per class
- Weighted PD
- PFA
- Computer readable

ALERT/LLNL Status

- ALERT/LLNL funded for:
 - Understand requirements for AATRs
 - Develop AATRs
 - Developing testing methods
 - Study limitations of limited testing & training data
 - Reporting results to stakeholders
 - Involving academia and training students
- Four teams to develop AATRs
- ATR Project reuse: scans on medical CT scanner and automated testing tools
- Unfunded participants welcome
- Feedback welcome

Open Issues

- Acceptance criteria
- Limited training and test data
- Objects of interest
- Policy changes to support and deploy AATR