



# DHS SCIENCE AND TECHNOLOGY

## Creating Equivalent Datasets

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# So What? Who Cares?

- **Goal:** Augment capabilities & capacities of vendors with involvement of third parties, especially academia
  - Vendor scans and TSA requirements: SSI, classified, company proprietary
  - Universities: Many foreign nationals and don't want to handle restricted information
- **Problem:** Impossible/difficult to provide datasets and requirements to academicians
  - Information is SSI, classified, FOUO, company proprietary
  - Foreign nationals; universities do not want to handle restricted information
  - Federal employees reluctant to make exceptions
- **Solution:** Create equivalent unrestricted datasets
  - Example “detect Coke in presence of Swiss cheese” instead of “C4 in stream of commerce scans”
  - Scan on related equipment
    - Example: Scan on late model medical CT or build mock checkpoint
- **Results:** ALERT task orders
  - CT – segmentation, reconstruction, ATR, adaptive ATR, video tracking of passengers and divested items, simulated air cargo, & AIT (MMW) with dielectric

# Example: Advanced Segmentation for CT-Based EDS

## ▪ Dataset Creation

- Non-threats scanned on medical CT scanner to create reusable datasets
- Common datasets for analysis by researchers

## ▪ Research Challenge

- Five performers from academia and industry provided innovative segmentation approaches

## ▪ Open Technical Interchange with all Performers

- Held joint symposium with TSA in December 2011 to showcase outcomes
- Legacy system vendors encouraged to establish information/results exchange

## ▪ Outcomes

- Database put into public domain and used by additional performers
- Metrics developed by LLNL to evaluate segmentation methods independent of TSL Certification
- Public domain segmentation algorithms available for ATR research
- One algorithm now part of checkpoint CT scanner; leading to 100s millions of dollars in savings



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**DIVERSE PERSPECTIVES + SHARED GOALS = POWERFUL SOLUTIONS**