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L-3 Weapons Algorithm 3rd Party API

ADSA 20

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L-3 Weapons Algorithm 3rd Party API

- Space: Automatic detection of weapons in cabin baggage
- Problem: DHS S&T wants to be able to evaluate L-3 ClearScan weapons detection capability on images from other scanners
- Solution:
  - Develop weapons algorithm server application and documentation for DHS S&T
  - Leveraging Stratovan DICOS 2.0A library to create L-3 weapons DICOS server (decided to use DICOS directly instead of using higher-level OPSL library)
  - L-3 algorithm will remap incoming DICOS data to L-3 ClearScan volumetric resolution (since our weapons algorithm is trained entirely on ClearScan images), process the data through the weapons algorithm and return any threat locations
- Results:
  - Will deliver DICOS server, and API usage document, to DHS S&T for evaluation
  - Will test internally using L-3 ClearScan images converted to DICOS
  - Currently do not have any non L-3 DICOS images to use to test
- TRL: 6
- Contact me for more info (jeff.stillson@l3t.com, 781-939-3804)

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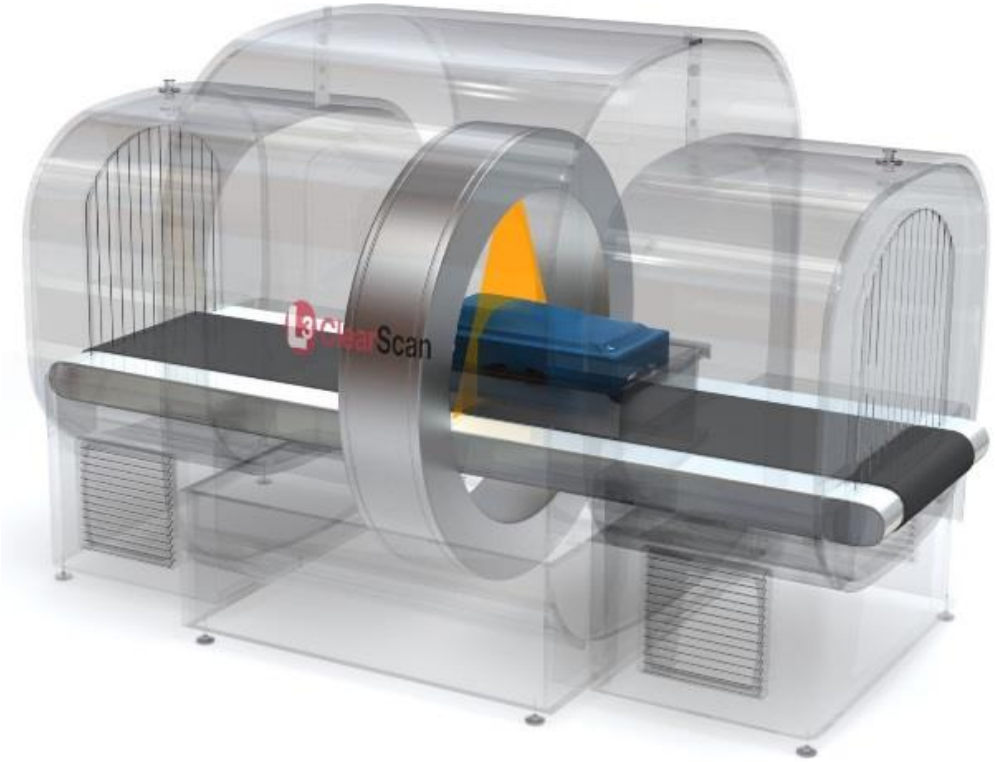
L-3 ClearScan Checkpoint CT

- Integrated aviation checkpoint security solution
- Eliminates divesting and re-vesting of liquids and electronics
- Explosive Detection
  - ECAC-EU C3 Standard Approved
  - ECAC-EU D/D+ Std 2 Qualified
  - TSA AT-2 Tier II certified



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Weapons Detection Algorithm

- **Adapted volumetric explosives detection algorithm to detect prohibited items (weapons)**
- **Received DHS S&T contract to further improve weapons detection capability**
  - Goal is to work towards TSA APSS weapons detection requirements
  - Already have real-time algorithm with good detection capability and low false alarm rate, working to improve and add support for new weapons

3rd Party API

- **DHS S&T contract funds the development of an API to allow running of the L-3 weapons algorithm against images from other scanners**
- **Decided to use DICOS for the API**
  - The DICOS library supports the notion of creating a server to process DICOS data and write out the detected threats in a Threat Detection Report
  - Stratovan DICOS library is well designed and well documented, they have provided excellent support when we've needed it
  - L-3 integrated the library to create a DICOS server application for the weapons algorithm
  - Will create an API document describing what we expect to be present in the DICOS data for the algorithm to function properly
- **Challenges**
  - Main issue in being able to process images from other scanners is that the algorithm is built entirely from L-3 ClearScan data so it is intended for images with ClearScan's resolution and reconstruction characteristics
    - Can resample images to match resolution, but will still not have same the reconstruction characteristics
  - DICOS algorithm will not run as fast as when the L-3 ClearScan system runs the native algorithm due to conversion to/from DICOS format and associated I/O

OPSL vs DICOS

- **Considered using the OPSL library for the weapons algorithm server, but decided to use the DICOS library directly**
  - Less work and lower risk of being able to deliver what we need to on our current contracts: convert files to DICOS 2.0A format and create a weapons algorithm server. These capabilities are supported by the DICOS library itself
  - Using OPSL would have required additional work as it is a more complex paradigm
  - As the DICOS library already supports 2.0A and Linux there was no risk of having to wait for these capabilities in the OSPL library
- **OPSL library sits on top of DICOS library and provides much more functionality, but it is a more complex library**
  - L-3 system software group is considering using the OPSL library in the future in the system/network software
    - Main issue in using it is that it requires licensing for use internationally, so we could use it to deploy in the US, but we sell systems throughout the world