Image Quality Metrics for Improving ATR

Matthew Merzbacher

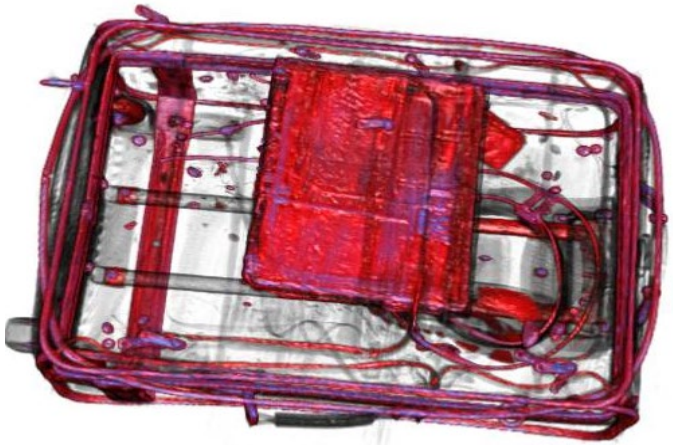
/ May 16, 2012 /

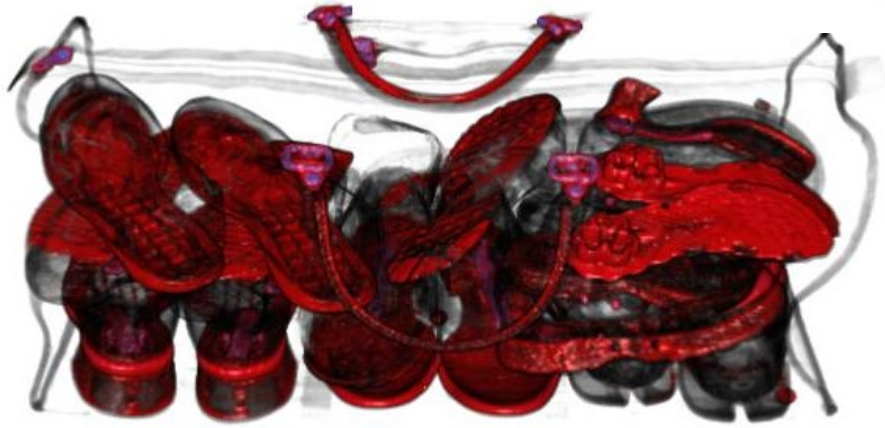
SAFRAN
Morpho

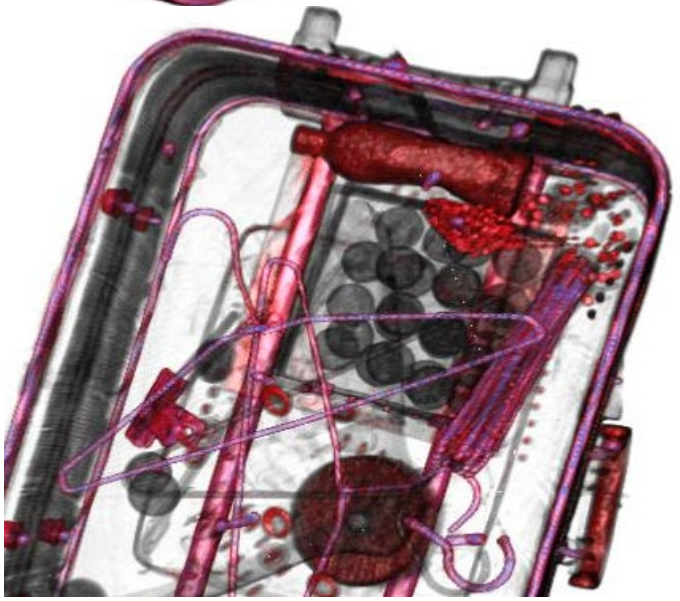
CONCLUSIONS

- To improve ATR is to improve any of several parts of ATR
- We do not need the world's most beautiful false alarms
- Contrast is King
- Thin objects need separation, bulk objects need consistency

CHALLENGE: WHICH OF THESE IS SAFE?







Images taken on MDI CTX 9800 or CTX 5800

SAFRAN Morpho

ATR AT A GLANCE

Shield & Explosive Segmentation

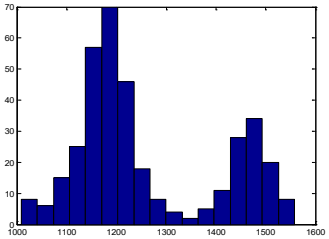
Object Clean-Up & Feature Calculation

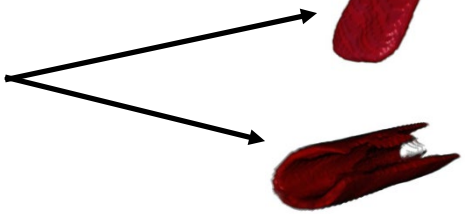
if break occurred

Histogram-Based Break

Corrections

Classification





- Military
- Commercial
- Sheet
- Shield
- HME
- etc.

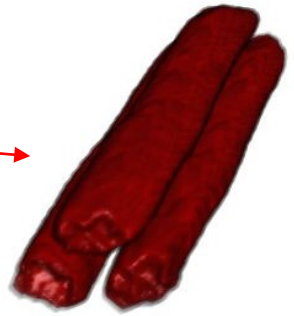


IMAGE QUALITY METRICS FOR ATR

- **To improve ATR is to improve any of the steps listed**
  - Segmentation, Disambiguation, Feature Extraction, Corrections, Classification
- **We do not need the world's most beautiful false alarms**
  - Though that may help for on-screen (operator) resolution
- **Contrast is King**
  - Adjacent objects should look different
  - Adjacent objects shouldn't cross-contaminate
  - Accuracy more important for threats which are non-homogenous
  - Containment wreaks havoc
- **Thin objects need separation, bulk objects need consistency**