Douane
Belastingdienst

R&D on the use of detection technologies

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Customs laboratory

Customs administration of the Netherlands

Where are we

- Evaluation of current performance
- Further improving efficiency and effectiveness
- Needs in data analytics, trade lanes, automated signal interpretation, use of new technology

What do we do

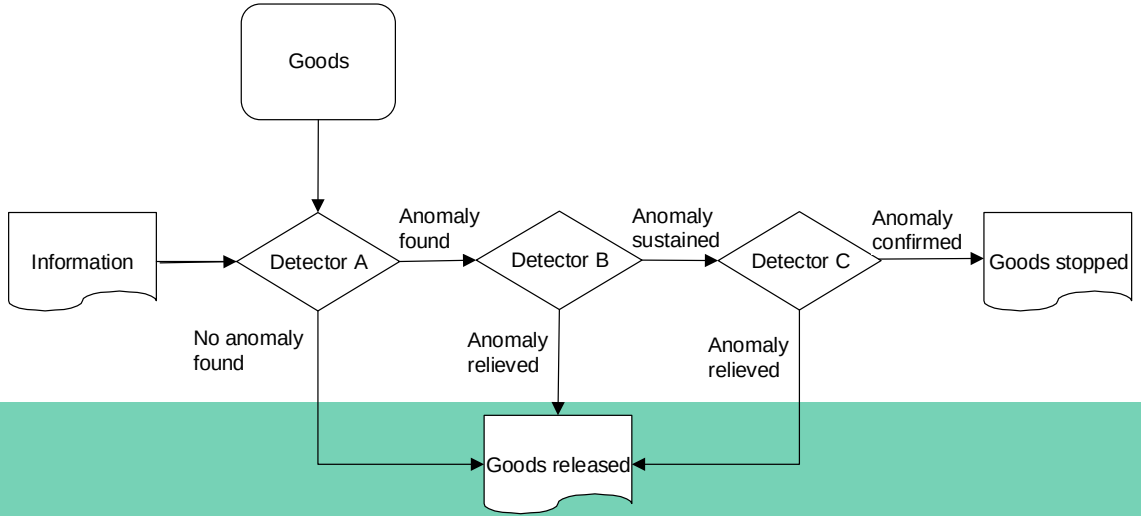
✓ Coordinate needs for R&D on EU level
✓ EU funded collaborative R&D projects
✓ Nationally funded R&D projects
✓ Pre-commercial evaluation of products
✓ Internal evalution of commercial products

What are we looking for

➢ International, EU or bilateral projects for developments
➢ International exchange of images, and standardisation of evaluation

Current use of detection technology

- Discern between (suspect) non-conform and conform
- Non-conform is evasion of tax and duties, excise goods, currency, radioactive and nuclear materials, drugs and their precursors, illicit pharmaceuticals, IPR infringement, CITES violations, weapons, explosives and their precursors, dual-use goods, etc.
- Fiscal irregularities are most prevalent. Drugs are prevalent, drug precursors, IPR infringing goods, cigarettes, etc. to a lesser extent.
- False positives (delay) are a concern
- True positives fuel a sense of effectiveness, but % false negatives?



Enforcement vision

This vision indicates where to seek further development for efficient and effective Customs enforcement:

- 100% supervision
- Layered enforcement concept
  - Green: from risk-oriented to compliance-oriented supervision
  - Yellow: smart & secure trade lanes
  - Blue: effective inspections carried out in the logistics flow
- Innovation in detection in data and goods
  - Data: application of data-analytical instruments
  - Goods: automated signal interpretation, new technology, integrated inspection of goods
- Coordinated border management

Please see https://youtu.be/diSix_3jO3M

Some key projects

100% supervision
- Automated detection in data and goods, combined

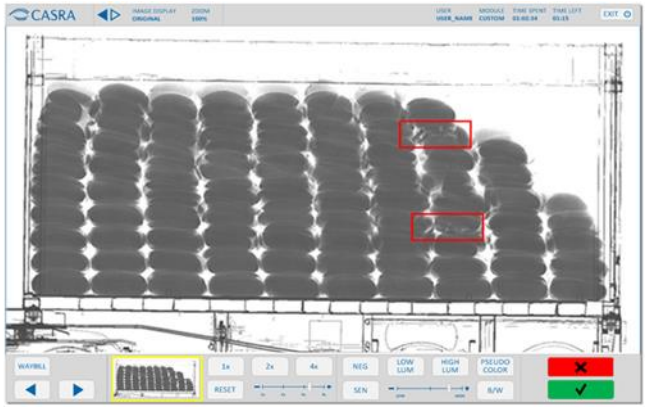
Layered enforcement concept
- Green: advanced random selection
- Yellow: FP7 CORE project (http://www.coreproject.eu/)
- Blue: Deployment of X-rays in the logistics flow

Innovation in screening data and goods
- Data: data-analytical filters for selection
- Goods: FP7 ACXIS (http://www.acxis.eu/)
  Horizon 2020 C-BORD (http://www.cbord-h2020.eu/)
  CT X-ray algorithm development
  Laboratory capability in the field

Coordinated border management
- 'Single' window (one for maritime and one for air)

ACXIS (Automated Comparison of X-Ray Images for Cargo Scanning)

- EU funded R&D project (http://www.acxis.eu/)
- Algorithms for containers/ trailers developed
  - Cigarettes, cocaine and weapons in containers
  - As part of the cargo/ as part of the container structure
- Test and train software now commercially available
- Model study into performance as result of training and ATR's
- Way more and specific development is necessary

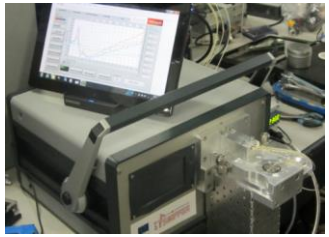


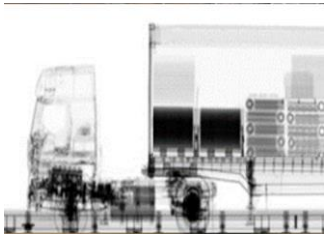
C-BORD (Effective Container Inspection at BORDer Control Points)

- EU funded project
- New and advanced technologies for Customs purposes
  - Tagged neutron, photofission, air analysis, radiation detection and X-ray
- Integrate use of technology with data elements from declaration
- Decision support for optimal use
- Main goal is to reduce FP
- Still running, final experiment in Rotterdam September 2018

See http://www.cbord-h2020.eu/ for more info



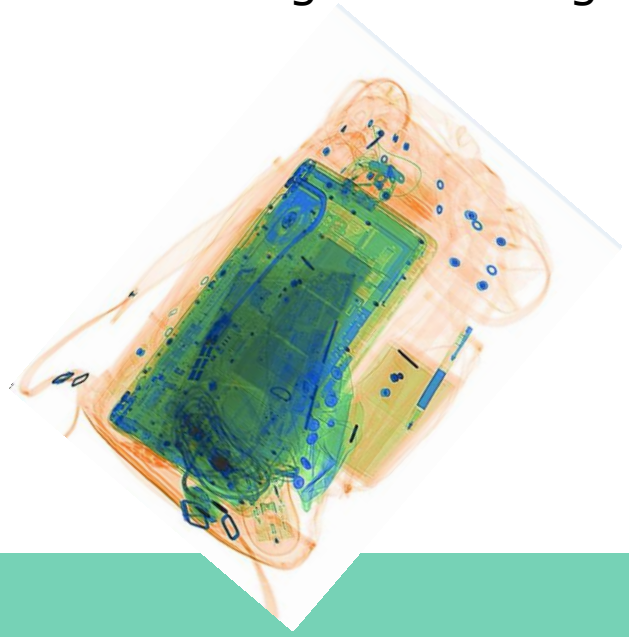


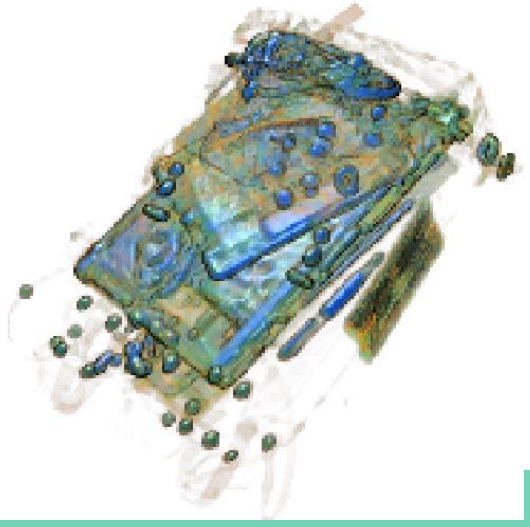


CT X-ray use and algorithm development

Development by Customs and Nuctech:

- Implementation 3D X-ray scans (CT X-ray) focus on postal- en courier supply chains and baggage
- Stepwise development of AI algorithms (cocaine and ATS)
- Stepwise development with validation at each step
- Seeking EU funding for elaborate pilot for e-commerce





Laboratory capability in the field

At present, screen samples with rugged mobile laboratory technology:

- X-Ray fluorescence (XRF)
- Infrared spectroscopy (FT-IR)
- Raman spectroscopy (RAMAN)

Next year, satellite laboratories

- Operated by Customs officers, overseen by laboratory staff?
- Screen a wider variety of goods, fast
- Releasing conformities on the spot

New to our field: advanced screening tools

- Gas chromotagraphy – mass spectromentry (GC-MS)
- Table top nuclear magnetic resonance (NMR)

Future projects, with EU partners or together?

- EU projects starting this year involving NL

Integrated novel technologies (muon based, DMA-MS, sensor array)

Enhanced of e-commerce inspection capability

- EU calls for 2019 and 2020 (see Horizon 2020 work programme)

Detecting threats in the stream of commerce without disrupting business (focus on dense cargo)

Disruptive sensor technologies for border surveillance

Pre-commercial procurements of innovative solutions

Contact the EU: Wilhelmus.VAN-HEESWIJK@ec.europa.eu

- National (or bilateral?) subjects for near future ext. funded projects

Algorithm development (data, signal, integrated)

Standardised NII evaluation, standardized image sharing

Satellite laboratories

Contact the NL: m.slegt@belastingdienst.nl

Overview of developments

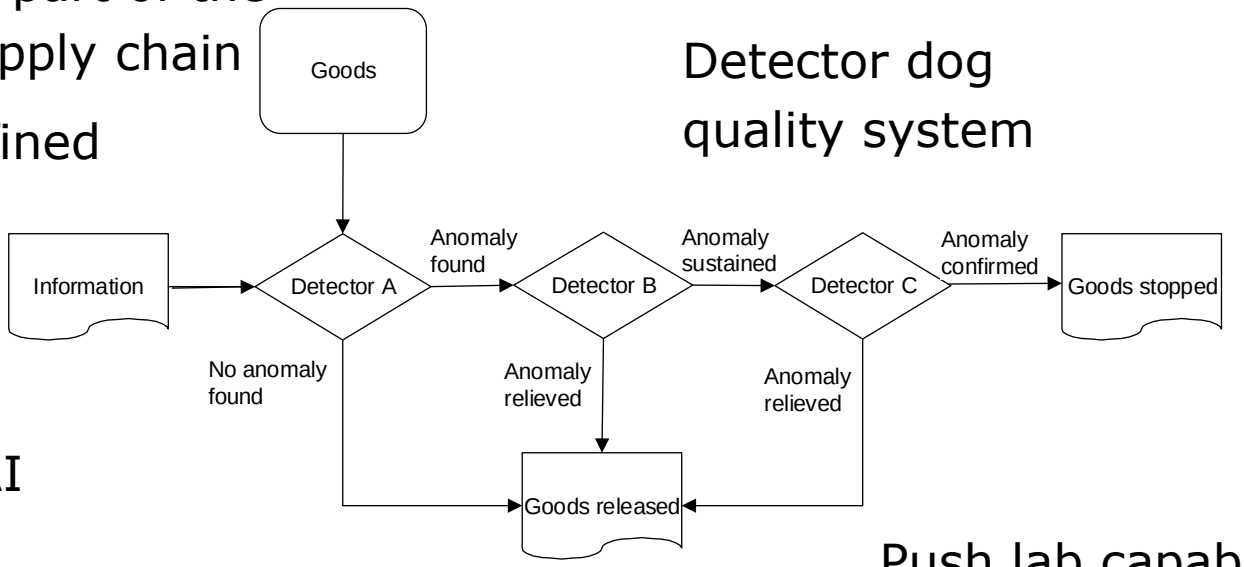
Technology use as part of the supply chain

AI signal interpretation

Detector dog quality system

More defined input

Include open source data



Apply AI filters

Random selection foundation

Evaluate novel technologies

Push lab capability into the field