



Modelling and Analysing the Cargo Screening Process

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Overview

Design a plug and play software tool:

- Map the right technology to the right commodity / threat combination
- Identify gaps in a current sensor system set-up – what new technology do we need?
- Allow for proper evaluation of new (and existing) sensor technology – how well do they work?
- Optimise given resources – get highest throughput / detection for fixed resources.



Research Challenges

- Level of abstraction: what is the level of detail we have to choose to get meaningful results?
- How much operator variability should we consider (e.g. fatigue, experience, compliance to rules)?
- How to collect / combine data: quantitative, qualitative, subjective, objective, missing...
- The developed model (simulation) can only be partially validated: how can we improve this?



Methodology

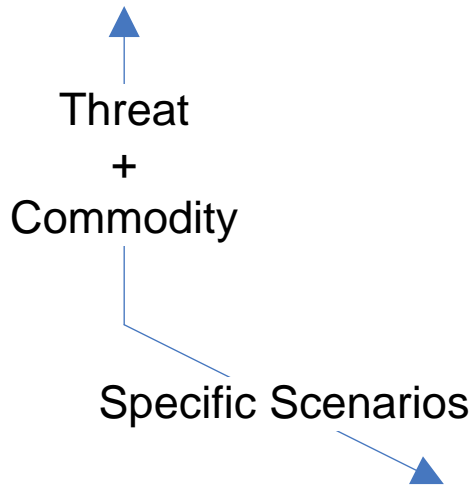
- *Model specific scenarios*: Use simulation to recreate specific and relevant scenarios
- *Collect existing data*: e.g. from sensor trials, manufacturers, other sources
- *Collect our own data (case study)*: Fill the gaps as we build the simulators
- *Build / Validate models and simulators*



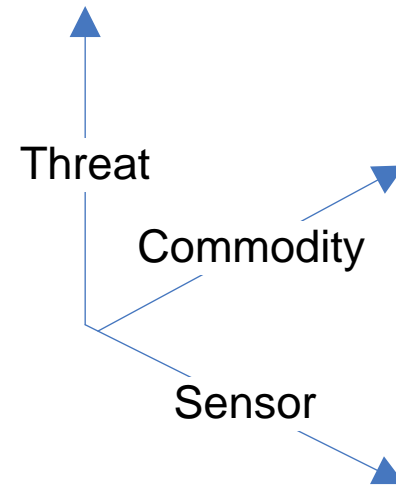
Deliverables

- Detection matrix (threat, commodity, sensor)
- Simulator
- Decision Support Tool

Detection Matrix Concept

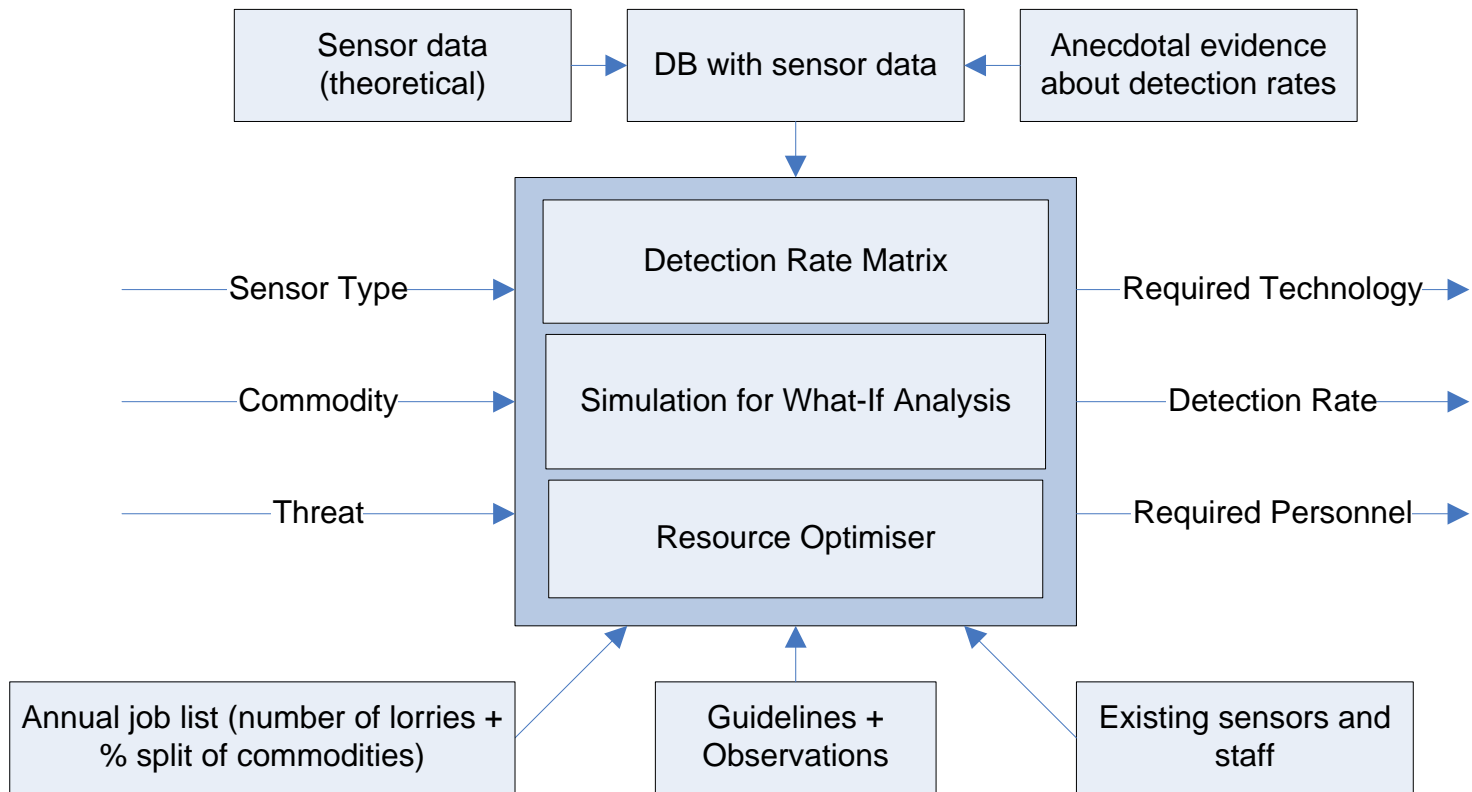


Initial Matrix (Approach 1)



Final Matrix

Decision Support Concept





Work Plan (Year 1)

1. Preparation (3 months): literature review, brief site visit, conceptual model, 'quick and dirty' simulator
2. Case study (3 months): data gathering, data analysis, data documentation
3. Initial design (6 months): initial model, initial simulator, conference papers