

## Reference database for automated image recognition of explosive ordnance

### *Most actionable and groundbreaking project*

#### **Problem statement**

How can automated imagery recognition be scaled to improve safety, efficiency, and cost-effectiveness, enabling humanitarian demining operators to have access to such technologies and analyze vast amounts of collected data more effectively?

Key bottlenecks to scaling include the resource-intensive process of model creation, the diversity of explosive ordnance types and designs, and access to explosive ordnance.

#### **Key factors/requirements**

- Incentives to share: encourage data collection from diverse stakeholders (NGOs, commercial, government).
- Data enrichment loop: continuously improve data quality.
- Security and ownership: ensure data security and define ownership rights.
- Contextual coverage: adapt framework for various countries and settings.
- Algorithm updates: develop algorithms for data quality control and maintenance.
- Data correlation: link field data with existing reference databases (e.g. CORD) for effective analysis.

#### **Proposed response**

Establishment of a collaborative global 3D reference database of explosive ordnance, which enables the development of multiple automated imagery recognition end-user applications tailored to specific humanitarian contexts and purposes. This database should be able to integrate technical and expert data, starting with textured 3D models and expanding continuously with enriched field-collected imagery data.

#### **Road map for implementation**

- Phase 1 – Funding and partnerships: secure funding from private and governmental donors and form coalitions with NGOs and governments who could contribute with data.
- Phase 2 – IT technical development: partner with IT providers for IT technical development of the database and its interface.
- Phase 3 – Data collection: an initial campaign to scan/create textured 3D models and compile other existing 3D models.
- Phase 4 – Quality control and pilot: implement quality control and pilot the use of the 3D database through the development or enhancement of a specific imagery recognition application.
- Phase 5 – Maintain database: maintain IT architecture and security protocols and sustain a continuous data collection effort with field images, videos, other sensors, and models.