

Date: July 17, 2025 Zürich, Schweiz

Project Paper: **Bench Pillars of *aid4face2geo* Humanitarian Data Processing & Storage**

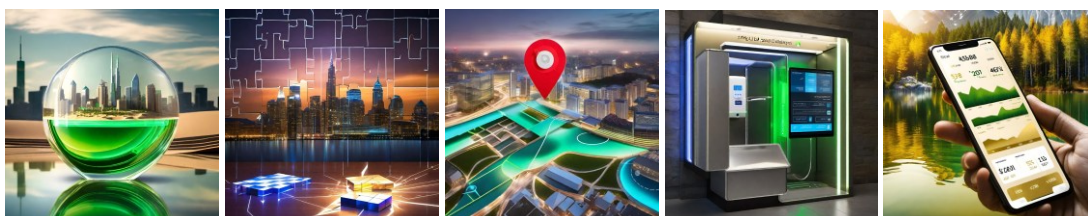
Compliant with UN Regulations & Swiss Data Law (FADP, GDPR)

1. Legal & Ethical Framework

- **UN Compliance:** Aligns with:
 - **OCHA Data Responsibility Guidelines** (2021)
 - **IASC Operational Guidance on Data Privacy**
 - **UNHCR Protection Standards** for refugee data.
- **Swiss Law:**
 - **FADP (Revised 2023):** Data stored with **Swiss-authorized providers**
 - **Military Goods Control (LGAM):** Ensures biometric tools aren't weaponized.

2. Secure Data Storage

- **Authorized Swiss Providers:**
 - **Exoscale** (ISO 27001, Swiss-hosted) for encrypted biometric DBs.
 - **TERRA LABS** (Geneva) for blockchain-backed geodata logs.
- **Data Sovereignty:**
 - Zero cross-border transfers unless anonymized.
 - On-premises fallback at **DIRECT-IMPACT's Zurich HQ**

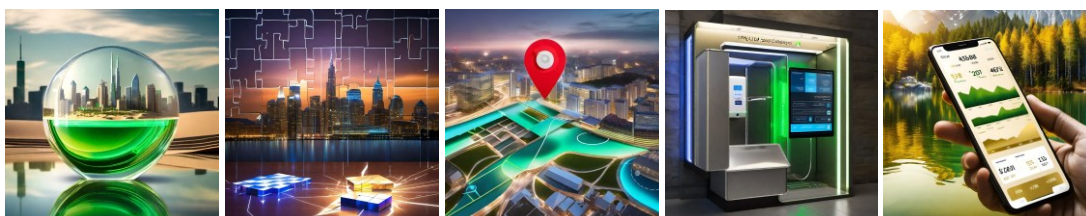


3. Technology Stack (*DIRECT-IMPACT's Implementation*)

- **Biometric Processing:**
 - **Facial Recognition:** Custom AI model (TensorFlow) trained on ethically sourced datasets.
 - **Liveness Detection:** Prevent spoofing via 3D depth mapping (Apple TrueDepth API).
- **Geolocation:**
 - **GPS+BLE Hybrid:** Combines satellite data with Bluetooth beacons for offline zones.
 - **UN-ETL Pipeline:** Filters/encrypts location data before storage.
- **Blockchain:**
 - Hyperledger Fabric for immutable audit logs of aid transactions.

4. Software Implementation

- **DIRECT-IMPACT's Development:**
 - **Core Platform:** Python/Django backend + React Native mobile app.
 - **APIs:**
 - **UNHCR PRIMES** for refugee ID cross-checks.
 - **Swiss Post GeoAdmin** for disaster zone mapping.
 - **DevOps:**
 - Kubernetes clusters (Swisscom Cloud) for scalable deployment.
 - **FIPS 140-2 Encryption** for data in transit/rest.



5. Access Control & Audits

- **UN-OCHA Approved Roles:**
 - Tiered access (field agents → HQ admins) via **Yubikey 2FA**.
- **Annual Audits:**
 - Conducted by **SGS** Société Générale de Surveillance or equal independent auditor for UN compliance.

Key Innovation as Swiss Partner

DIRECT-IMPACT seeks to leverages:

- ☑ **Swiss Neutrality:** Trusted data jurisdiction.
- ☑ **UN Geneva Hub:** Fast-track collaboration with ICRC/WFP.
- ☑ **ETH Zurich AI Research:** Optimizing models for low-bandwidth environments.

Example Workflow:

1. Refugee registers via *aid4face2geo* app → Face + GPS hashed → Stored in Exoscale.
2. Aid worker scans face → System pulls encrypted geo-history → Allocates supplies via blockchain ledger.

