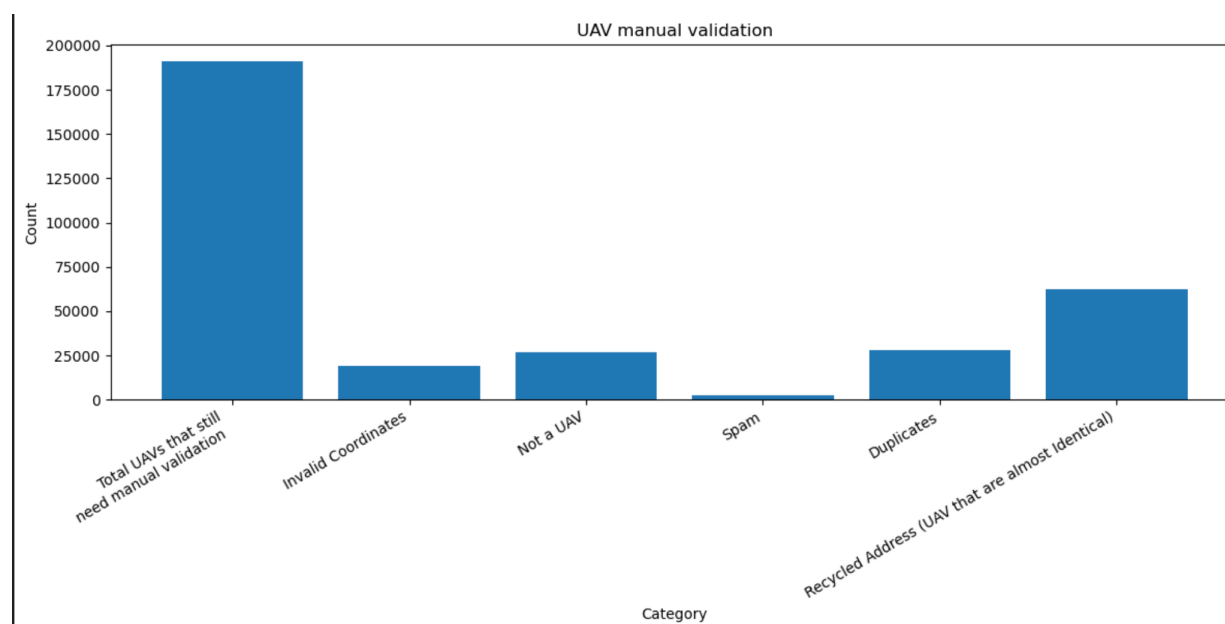# Unknown Attack Vectors (UAV): Reputation-based Reward System & Manual Validation Framework

Cycle c1 – Dec 17 2025

New statistics on the UAVs

UAVs are our top priority. They are made to expose real gaps in global address detection. The UAV process is still heavily manual and the numbers make that clear.

Over **190,845 UAVs** were received.

Over **19,087** entries fail due to invalid coordinates
More than **26,537** are "not UAVs" at all (<u>see page 15</u>)
Nearly **2,353** are obvious spam (<u>see page 15</u>)
More than **27,978** are an exact match/ exact duplicates (<u>see page 15</u>)

More then **62,277** are similar enough to be considered duplicates like:

pna, pna, college road, overstrand ward 3, hermanus, overstrand local municipality, western cape, 7202, south africa
pna, college road, overstrand ward 3, hermanus, overstrand local municipality, western cape, 7202, south africca

From these **190k** we have manually validated and found **138k**+ entries that are clearly low value exploits.

From the remaining ~**52k**:

- The majority are valid but low-impact variations (already scored, not strong UAVs)
- Around 10–12k are in a "for deep review" bucket – these are either:
    - very strong, subtle UAVs or
    - very sneaky exploitation patterns

Every one of those edge cases has to be double- and triple-checked by a human validator before we decide whether it's a perfect UAV or something we should reject entirely. That takes real time and real effort.

Every one of these cases must be reviewed by a human validator to be approved, fixed, or dismissed. This process is time-consuming and demands careful attention, emphasizing the importance of having a robust scoring, filtering, and reputation system in place.

The UAV framework helps cut through the noise and prioritizes genuine, high-value findings. This is especially challenging with widespread false or low-quality data. That said, the work still being done on over time and its far from finished. The team continues to put in significant effort, making sure every miner gets the score they deserve and works hard for. Pushing through the noise to identify the few valuable signals hidden among the clutter.
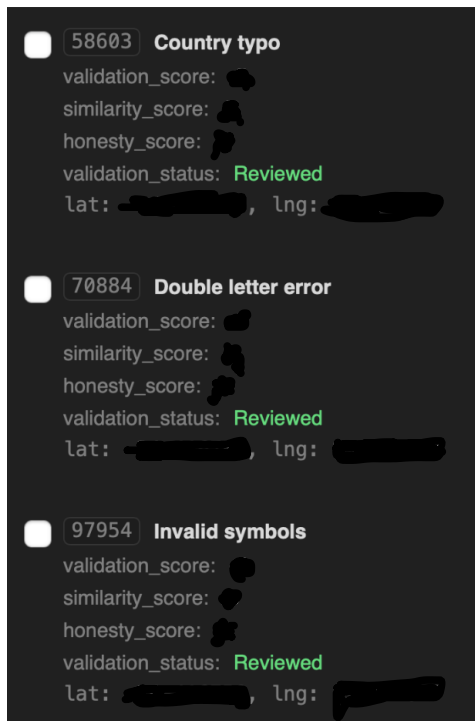
Deeper Dive on the Manual Validation Process
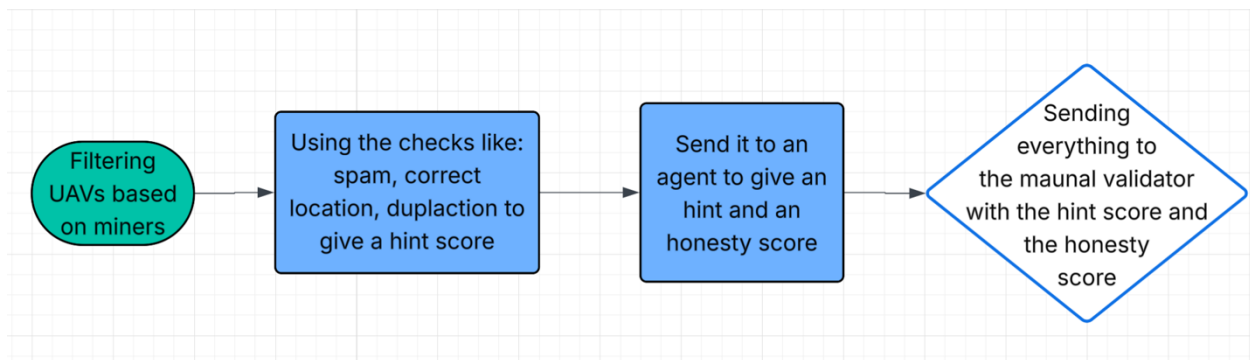
This is a little window on how the manual validation is done:

1) **Fetching the data from the database**
   a. Select the **"Not - Processed"** status.
   b. Select a **Miner ID/Hotkey**.

LDS Agent Giving Honesty and Similarity score

- Based on the label and how accurately it matches with the manipulation done to the address, the agent gives an honesty score
- This is taking into consideration when manually validating, helping the manual validator and speeding up the process
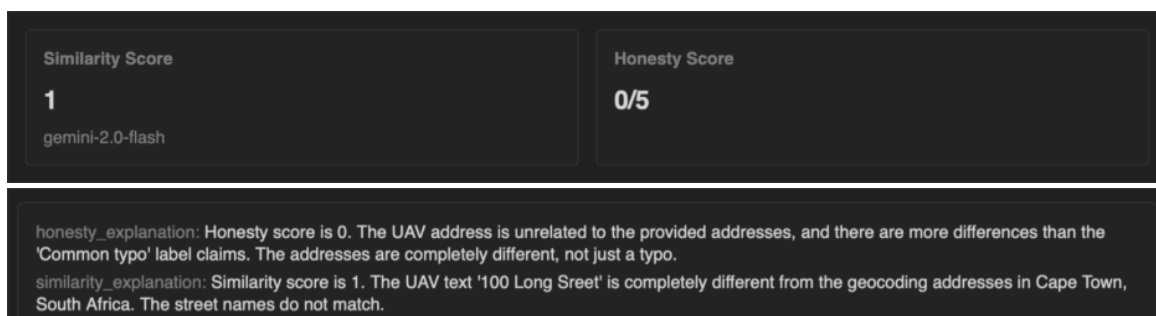
2) **Review an individual UAV**
   a. Compare UAV text against:
      i. Miner label
      ii. Primary address text
      iii. Primary address latitude and longitude

    iv. Secondary address text

    v. Secondary address latitude and longitude

3) **Decide on individual scoring**

    a. UAV's are scored from –5 (clear exploit) to 5 (new address not found on Nominatim)

    b. **Use the map when text is unclear**

        i. If text comparison is inconclusive, check the map to confirm or clarify details.

        ii. Verify whether the UAV location matches the address returned by the APIs.

        iii. If it doesn't zoom in to check nearby roads or addresses. The UAV may still be correct even if the addresses differ slightly.
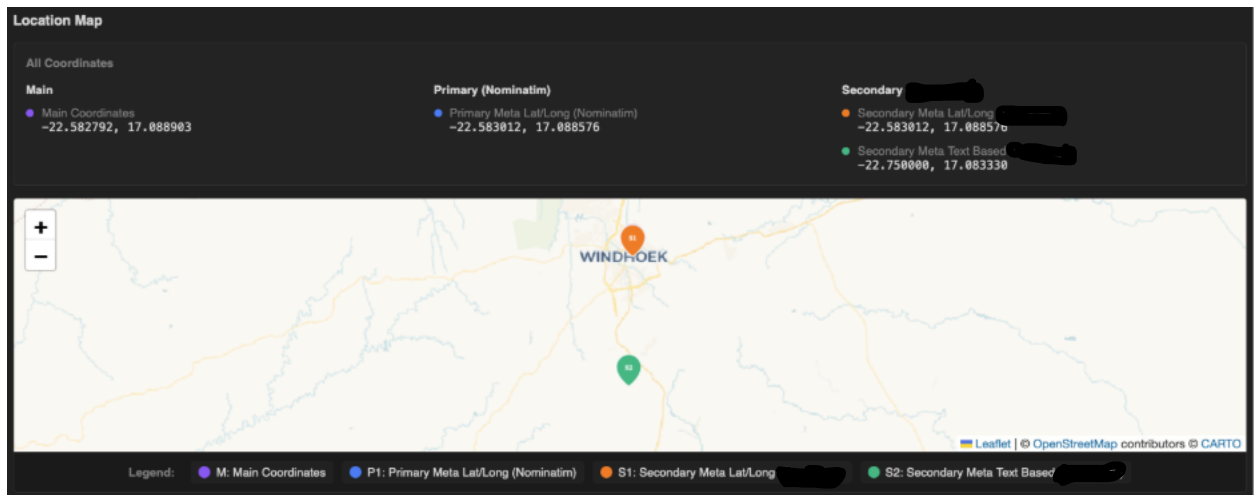
Process Scoring for manual review

Score +5 (rare)

- Perfect – high-quality UAV, realistic, well-labeled
- It's an address
- Nominatim didn't find it (address-based text)
- Reviewer uses google to search it
- Good label
- Not just a common typo or removing/changing info. Address change must be very clever.

Score +3/+4 (still rare)

- Good – usable with minor issues
- Nominatim didn't find it (address-based text)
- Looks like an address
- Good label
- Not just a common typo or removing/changing info.

SCORE +4

Label	Missing letter in 'building'
Review comment	Specific label. Good address. Not found by apis
UAV text	bilding 1, 66th Street, Amarapura Township, Amarapura District, Mandalay City, Mandalay, 05062, Myanmar
API text	Amarapura Township, Amarapura District, Mandalay City, Mandalay, 05062, Myanmar

SCORE +4

Label	Transposed letters in 'Bhamo'
Review comment	Specific label. Good address. Not found by apis
UAV text	983 Bhmao - Namkham Road, Mant Aweit, Shan State, Ta'ang State, Myanmar
API text	Bhamo - Namkham Road, Kun Long, Shan State, Ta'ang State, Myanmar

Score +2/+1 (most good ones end up with this score)

- Acceptable – partial, noisy but still useful
- Simple typo changes.
- Simple word changes: one to two words are different, missing or added.
- Label not perfect.

SCORE +2

Label	Local abbreviation
Review comment	Label is correct. No big change but wasn't found by API.

UAV text	BOU. Cdt Hamsali Sayah Miloud, Bab el-Hadid, Beau Séjour, Boudghene, Tlemcen, Tlemcen District, Tlemcen, 13000, Algeria
API text	Boulevard Cdt Hamsali Sayah Miloud, Bab el-Hadid, El Kalaa, Boudghene, Tlemcen, Tlemcen District, Tlemcen, 13000, Algeria

SCORE +1

Label	Missing street component
Review comment	Label says missing street, but it's changed. The address is good overall.
UAV text	hall f, stokes street, southern industrial area, khomas, 10000, namibia
API text	Windhoek Show Grounds, Bell Street, Southern Industrial Area, Windhoek, Khomas, 10000, Namibia

Score 0

- Unclear – insufficient signal
- When sent to the api the coordinates match the coordinates sent.
- Coordinates are not in the same region.

SCORE 0

Label	Common typo
Review comment	Not a UAV. Label is correct. Good address but was found by the API.
UAV text	RR 8, Centre Administratif, Bosangoa, Ouham, Central African Republic
API text	RR 8, Centre Administratif, Bossangoa, Ouham, Central African Republic

Score –3

- Score for duplicate when detected and reviewed by reviewers

Score –5 (if bad score during manual review most would end up here)

- Cheat / fake / exploit
- Recycled or structurally reused
- If the UAV is just spam text or empty address
- No change

SCORE -5

Label	Common typo
Review comment	No change. Label not accurate.
UAV text	9, Озёрная улица, Заводское, Централный район, Simferopol, Simferopol District, Autonomous Republic of Crimea, 295021, Ukraine
API text	9, Озёрная улица, Заводское, Центральный район, Simferopol, Simferopol District, Autonomous Republic of Crimea, 295021, Ukraine

SCORE -5

Label	Common typo
Review comment	Different address to address in coordinates.
UAV text	16, Камсамольская вуліца, Ciomnyja Kram, Tsentralny District, Minsk, 220030, Belarus
API text	2Б, вуліца Барташова, 20-ы мікрараён, Zhlobin, Zhlobin District, Homyel Region, 247210, Belarus

SCORE -5

Label	Common street abbreviation with missing direction

Review comment	Just the street and it doesn't even match the coordinates address.
UAV text	Long Street
API text	Meeting Point, Strand Street, Cape Town Ward 115, Cape Town, City of Cape Town, Western Cape, 8001, South Africa

SCORE -5

Label	Common typo
Review comment	Recycled = (duplicate but not exact match)
UAV text 1	Complexe wilon 77172119 Jean Bi Douabou Yanantifla Marahoué, Sinfra, Ivory Coast
API text	Wilson hotel, 77172119, Avenue Jean Bi Douabou, Yanantifla, Sinfra, Marahoué, Sassandra-Marahoué, Côte d'Ivoire

Note: For all UAV's that are duplicates and recycled, the first one received gets a score based on how good it is. Everything after gets reviewed and is penalized with a –5 or –3. The reason being is that these UAVs are manually valuated, wasting the manual validations time with the same UAV deserves a penalty. We want all UAVs to be unique to help build this LDS system.

Cycle 1 – updates Dec 5th, 2025

Introduction

Screening systems rely on location detection systems that should accurately identify and validate global residential addresses and if these addresses locate in sanctioned or high risk countries and regions.

Reliable address data supports operational integrity, quality control, and fraud prevention. As data grows and user behavior evolves, many geocoding APIs struggle to detect certain real addresses. These missed locations are known as Unknown Attack Vectors or UAVs. A UAV is a real residential address that current automated tools fail to identify. These gaps can lead to exploits, reward manipulation, and system weaknesses.

This white paper presents a clear framework for finding, validating, and scoring UAVs. The goals are simple. Improve the system's ability to detect new and unusual address patterns. Build a fair reward and reputation model for miners who discover these UAVs.

The paper describes the UAV categories and how they are scored. It then shows the validation flow with examples of correct and incorrect submissions. It also explains the key safeguards that protect the process. These safeguards include checks for duplicates, region validation, and basic semantic reviews. Together, they help prevent spam and ensure miners submit accurate information.

Following this structured method makes the platform more resilient. It also helps reduce errors and improves the detection of unknown addresses. It also enables the community to help produce stronger, more reliable geocoding results.

UAV Definition & Criteria

A UAV, an unknown attack vector, is a real residential address that our current API does not catch. All UAVs undergo vetting and manual validation against criteria such as realness, spam filtering, duplication, API catchability, cross-API reality, residential classification, and labeling correctness.

Miner Submission Guidelines

To preserve data quality and fairness, miners must:

- Avoid duplicates and trivial variations (symbol/number changes or language copies).
- Ensure coordinates and labels are plausible and consistent.
- Provide concise reasoning labels for each UAV (e.g., local abbreviation or transliteration).
- Submit distinct entries; if multiple miners find the same type of UAV, points are averaged.

Reward Scoring Framework

Scores range from −5 (exploit) to +5 (unique address missing from API).

Criteria	❌ −5	⚠️ −3	➖ 0	✅ 3	🌟 5
Example: Address Validation	Exploit	Duplicate	No break	Breaks system (simple changes)	Breaks system (address missing from API)

UAV Grading Flow

Step 1: Check for Duplication - ensure the same UAV is not submitted multiple times.

Step 2: Validate Address Region - confirm coordinates belong to the correct region.
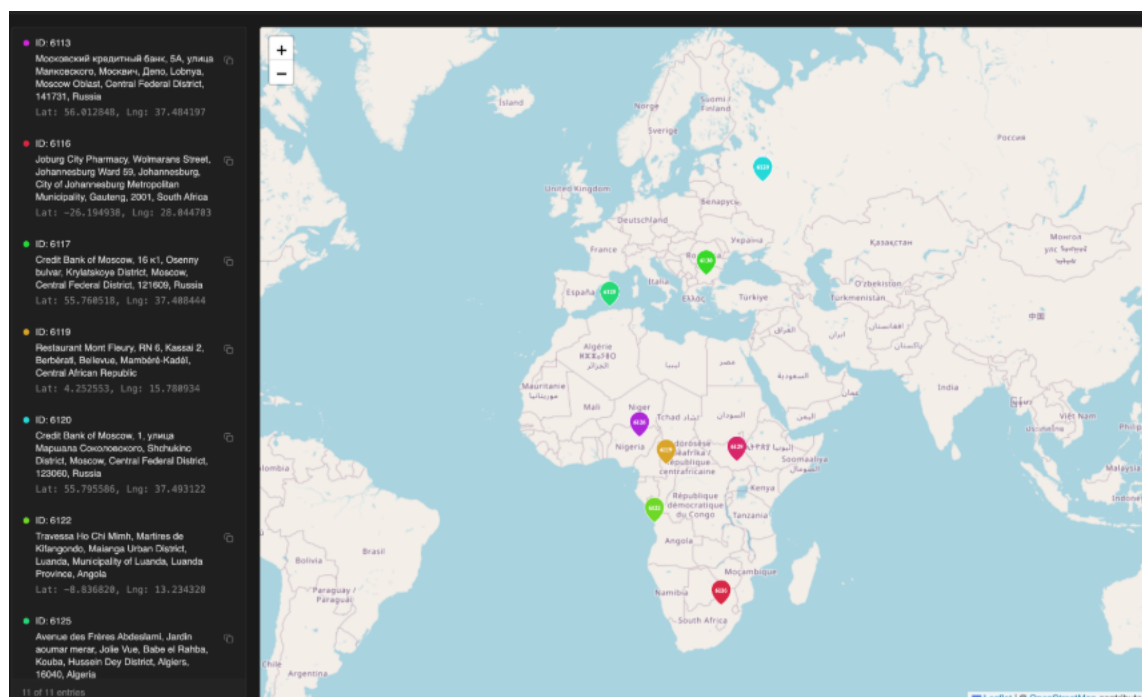
Step 3: Semantic Check - quick review to filter spam or irrelevant data.

Step 4: Confirm UAV Authenticity - verify via Nominatim or other APIs (where applicable).

Step 5: Manual Validation & Scoring - assign score from -5 to $+5$.
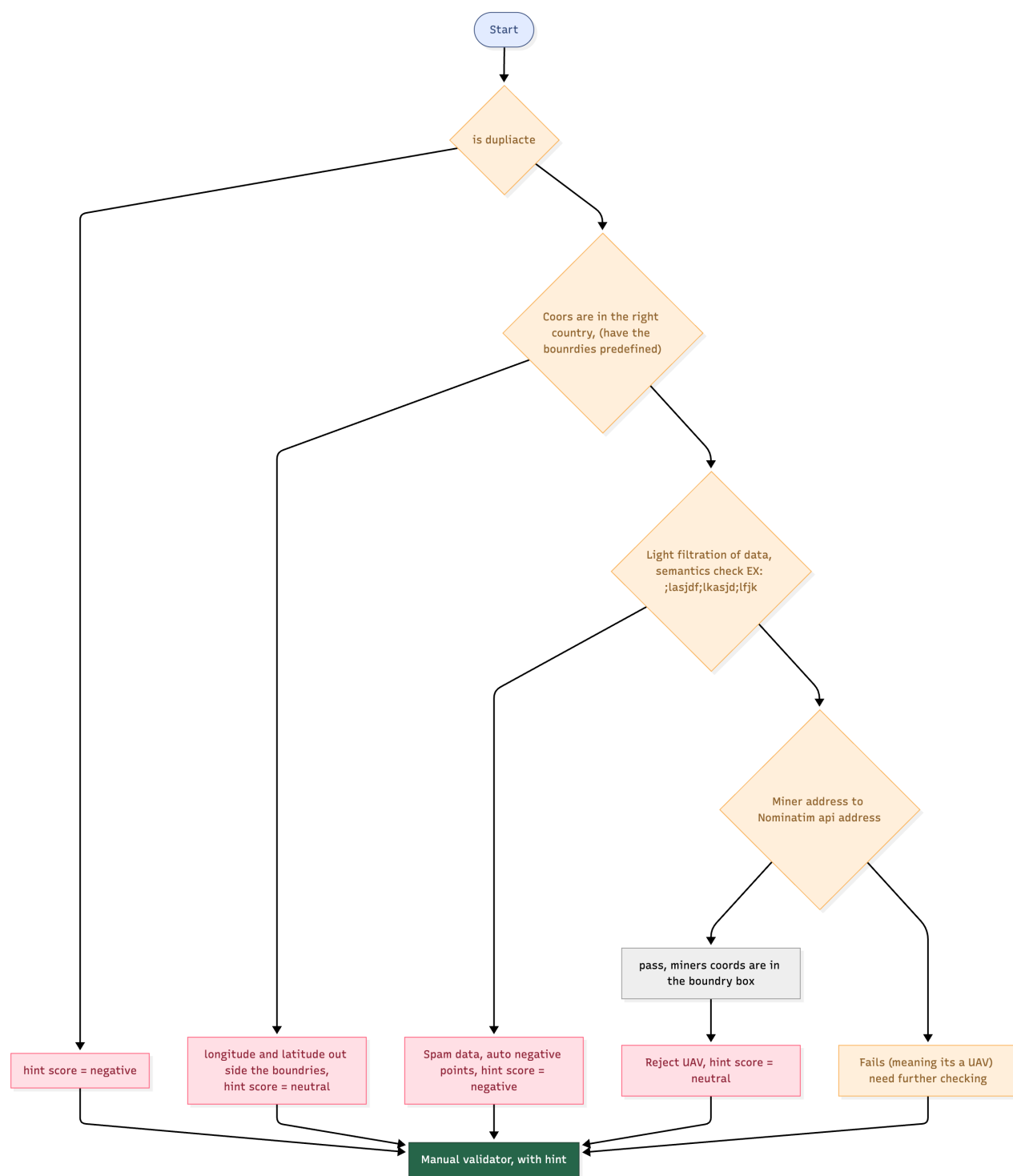
(Figure 1: UAV Grading Flow)

(Figure 2: Address Heat Map — All addresses will be plotted to assist manual validators)

Examples and Rejections

Invalid Coordinates

uav_text	label	long	lat
Boulevard Jean Jacques Dessalines, Portail Léogâne, 6e Turgeau, Pòtoprens, Port-au-Prince Arrondissement, West, 6114, Port-au-Prince, Haiti	Hyphen removed from compound name	0.0	0.0
South Avenue Maramba, Kilobelobe I, Bel-Air 2, Kampemba, Ville de Lubumbashi, Haut-Katanga, Lubumbashi, Democratic Republic of the Congo	Added directional indicator	0.0	0.0

Not a UAV — Nominatim catches

uav_text	label	long	lat
Mercado Industrial, 11, Los Mangos, Rolo Monterrey, Ciudad de Moa, Moa, Holguín, 833330, Cuba	Common typo	-74.9313282	20.6550807
a Ruteados Managua, Matagalpa, 61000, Matagalpa, Nicaragua	Address format word order variation	-85.9253571	12.9210895
briwilsoft it solutions, 31, ikola road, alimosho, 100276, nigeria	Missing city	3.2536254	6.6205601

Spam Data Detected

uav_text	label	long	lat
7046.230833835763 George Plaza, Avarua 16352, Cook Islands	Modified the street number	-159.77546	-21.2075
C.S.D.C.A., ,2753 , المتن, lebanon	Name abbreviation	35.5762207	33.8654919
alhmdu hardware, 0(,₿¤±✗←※↑, bardere road, wajir, wajir, wajir, 70(,₿¤±✗←※↑20(,₿¤±✗←※↑0(,₿¤±✗←※↑, kenya	Invalid housenumber characters	40.0581495	1.7510756
O. T. F., nh11, MC, M.T., MD, mandalay, 05251, myanmar	Address abbreviation	95.3897066	21.4357978
K.T.P., R. E. S., N.C., T. P., 3. G. S., étroits, CA, A.D.L.G., D.D.L., , 6510, haiti	Address abbreviation	-72.9490542	18.8587427

Is Duplicate

uav_text	label	long	lat
Sadnile Thusi Road, eThekwini Ward 27, Durban, eThekwini Metropolitan Municipality, KwaZulu-Natal, 4000, Durban, South Africa	Common consonant transposition typo	31.0130139	-29.8333284
Vivain Olunwa Circle, Port-Harcourt, Rivers	Common vowel transposition typo	7.0303527	4.7925138

State, 500211, Port Harcourt, Nigeria			
of Angola, 3, Dr. António Agostinho Neto Square, Windhoek Central, Windhoek, Khomas, 10000, Namibia	Missing street component	17.086231231689453	-22.57662582397461

Simple UAVs

uav_text	label	long	lat
McNamara Road, Tortola, VG1110, British Virgin Islands	Missing street component	-64.61797332763672	18.413677215576172
dương quảng hàm, moyo, thủ đức, 71400, vietnam	City country mismatch	106.6935904	10.8254726
senator ibrahim barau jibrin lecture delivery centre (lcd), senator ibrahim barau jibrin lecture delivery centre (lcd), gombe - potiskum road; ashaka bajago road, gombe, 760214, nigeria	Double letter error	11.1491287	10.3148174
ilkob ar, 72a, ленинградский проспект, дзержинский район, ярославль, городской округ ярославль, , 150000, russia	Name typo	39.7680126	57.696233
La Passage Franciosy, Monte-Carlo, 98000, Monaco	Passage Franciosy, Monte-Carlo, Monaco, 98000, Monaco	Article added to street name	7.4292139	43.7432066
Hôpital Général de Référence d'Uvira Bis, RN5, Rombe1, Bavira (chefferie), Uvira, South Kivu,	Hôpital Général de Référence d'Uvira, RN5, Rombe1, Bavira (chefferie), Uvira, South Kivu,	Added fake suffix to street name	29.1388614	-3.3911526

Democratic Republic of the Congo	Democratic Republic of the Congo			
Blonab Les cases rondes, Rue 434, Baco-Djicoroni, Sabalibougou, Bamako, Mali	Blonba Les cases rondes, Rue 434, Baco-Djicoroni, Sabalibougou, Bamako, Mali	Common letter transposition typo	-8.0120398	12.6002533

High-Valued UAVs

uav_text	label	long	lat
Somerset East Bosberg Nature Reserve, Blue Crane Route Local Municipality, Eastern Cape, 5850, South Africa	Real house found in Photon but not in Nominatim	25.560463	-32.703228
평양오리고기전문식당, Pyongyang, North Korea	Real address on Google Maps	38.978329	125.717356

Reputation & Penalty Notes

All miners start at a neutral reputation baseline and reputation adjusts with validated results. Duplicate or spam-like UAVs reduce scores; unknown addresses that reveal API gaps increase scores.