

# Google's Anti-Bot Countermeasures (2025-2026)

## Anti-Bot Countermeasures

Google Maps difficulty score: **90/100** — one of the toughest platforms to scrape.

## BotGuard / SearchGuard Architecture

Built on **BotGuard** (internally "Web Application Attestation"), deployed across YouTube, reCAPTCHA v3, and Maps. **SearchGuard** (January 2025) is the Search-specific evolution — "tens of thousands of person hours and millions of dollars."

## Detection: Behavioral Analysis (4 Signal Categories)

Signal	Bot Threshold	Human Range
Mouse movement (trajectory, velocity, acceleration, micro-tremors)	Velocity variance <10	50-500
Keyboard rhythm (inter-key intervals, duration, errors)	Variance <5ms	20-50ms
Scroll behavior (amplitude, direction, timing)	Delta variance <5px	20-100px
Timing jitter (Welford's algorithm)	>200 events/sec	10-50

# Detection: Browser Fingerprinting (100+ Signals)

Navigator, screen, performance metrics, WebRTC leaks, TLS fingerprinting. Explicit checks for `navigator.webdriver`, ChromeDriver, Puppeteer, Selenium, PhantomJS.

## reCAPTCHA v3 (Invisible)

No visible challenge — assigns 0.0-1.0 score based on session behavior. On Maps, appears **inconsistently**. Only bypass: never trigger it.

## Cryptographic Protection

ARX cipher (similar to NSA's Speck). Magic constants rotate per script update. Scripts served with integrity hashes. **Bypasses become obsolete within minutes.**

## Blocking Behavior

Trigger	Risk
Datacenter IPs	Blocked immediately — non-viable
Uniform request timing	High — humans pause, bots don't
Direct navigation to data pages	Medium — humans wander first
Default/missing headers	Medium

**Stealth detection:** Google returns **poisoned/incomplete data** to detected scrapers rather than blocking outright. Soft bans aren't clean HTTP codes — "some weird JSON response or just incomplete page loads." DOM class names change every few months.

## Proxy Effectiveness

Type	Effectiveness	Cost	Notes
Datacenter	Very Low	\$	Non-viable for Maps
Residential	Good	\$\$	~30-50 searches/hour/IP before CAPTCHAs
Mobile (4G/5G)	Best	\$\$\$	Most reliable for large-scale

ISP	OK (low volume)	\$\$	Burns fast. Once flagged, stays flagged for days
Hybrid	Cost-optimized	\$\$	Datacenter for non-Maps, mobile for Maps. Saves 40-60%

Practical rate limit: **max 1 req/min/IP** = ~144K results/day per IP.

# Anti-Detection Toolkit

- `playwright-stealth` / `puppeteer-extra-plugin-stealth` (17 evasion modules) — near-essential
- `undetected-chromedriver` for Selenium
- CapMonster Cloud for automated CAPTCHA solving
- FlareProx — Cloudflare Workers proxy for IP masking (100K free daily requests)
- Cookie banner handling: `document.querySelector('#sp-cc-accept')?.click()`
- CAPTCHA detection: `document.querySelector('form[action*="validateCaptcha"]')`
- Image/font blocking via `Network.setBlockedURLs`
- Search-based navigation to bypass Feb 2026 "limited view" lockdown

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Revision #1

Created 2026-06-05 23:48:53 UTC by Ben Adrian Sarmiento

Updated 2026-06-05 23:48:53 UTC by Ben Adrian Sarmiento