ICML
International Conference
On Machine Learning

Jailbreak Foundry

From Papers to Runnable Attacks for Reproducible Benchmarking

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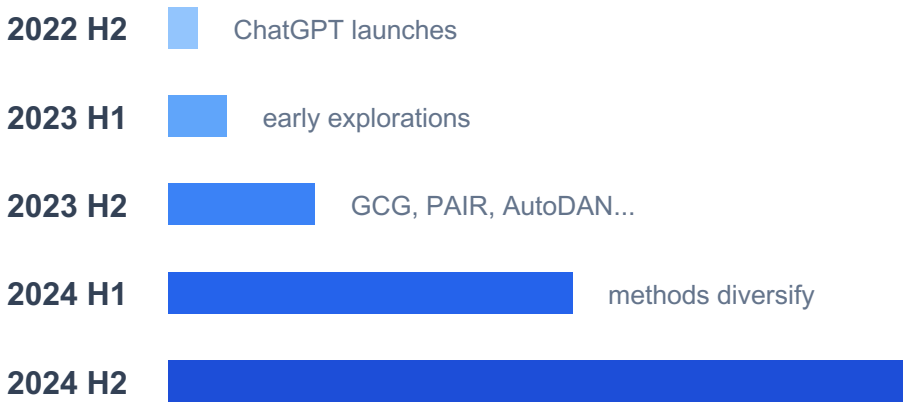
Jailbreak methods keep accumulating

258
jailbreak papers
curated 2022–2024 dataset [1]

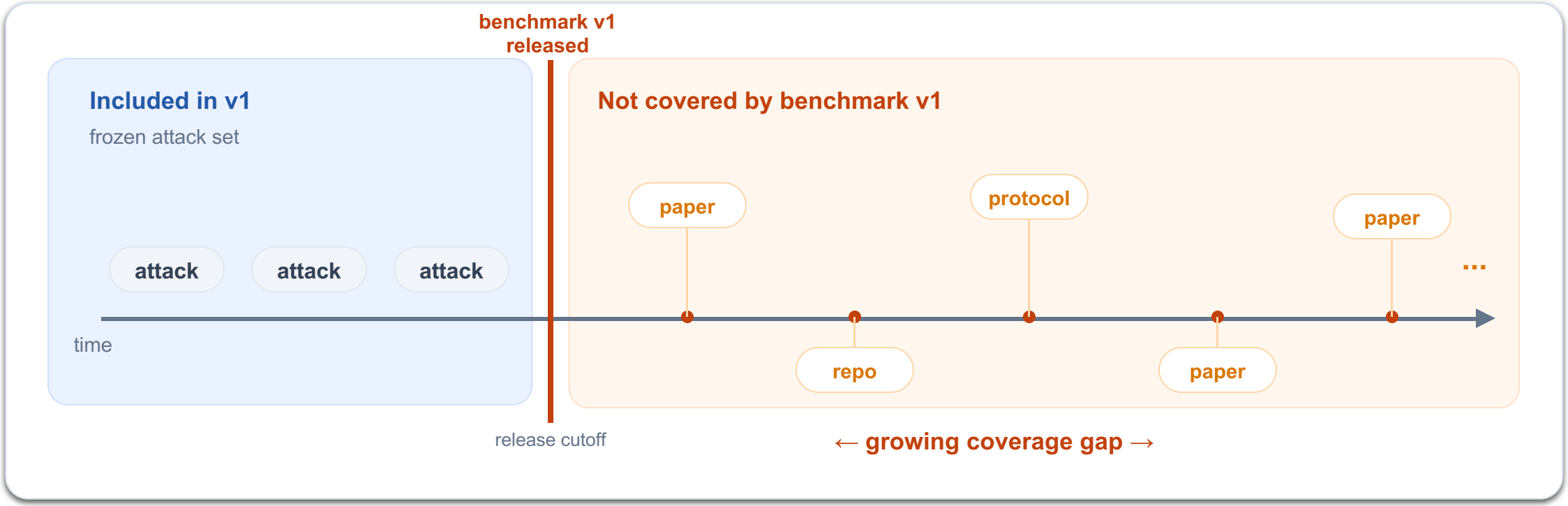
200+
cataloged attacks
across research repositories [2]

~50,000
LLM safety papers
in the first two years post-ChatGPT [1]



[1] Chu et al. 2026, Benchmark of Benchmarks · [2] Chu et al., ACL 2025, JailbreakRadar

Problem 1: New jailbreak papers and repos arrive after release cutoffs, creating a growing coverage gap.



Until papers become runnable modules, their attacks remain invisible to robustness measurement.

Problem 2: reported ASR (Attack Success Rate) changes meaning when dataset, model, judge, or protocol changes.

QueryAttack

reported ASR

82.2%

measured under

- Dataset: AdvBench
- Victim: GPT-4
- Judge: GPT-4
- Protocol: QueryAttack paper protocol

not directly comparable

settings differ

Past-Tense

reported ASR

88.0%

measured under

- Dataset: JailbreakBench (JBB)
- Victim: GPT-4o
- Judge: GPT-4
- Protocol: Past-Tense paper protocol

ASR is a bundled measurement

ASR = f(dataset, model, judge, protocol)

dataset | model | judge | protocol

Align dataset, model, judge, and protocol before comparing ASR.

Preview of results

We built infrastructure that reproduces 30 attacks and evaluates them under one fixed harness — pipeline details next. Three patterns emerge from the comparable data.

1

Robustness is attack-dependent

A single average hides the real picture: the same model can range from 0% to 94% ASR across different attacks.

2

Best attack strategy is victim-specific

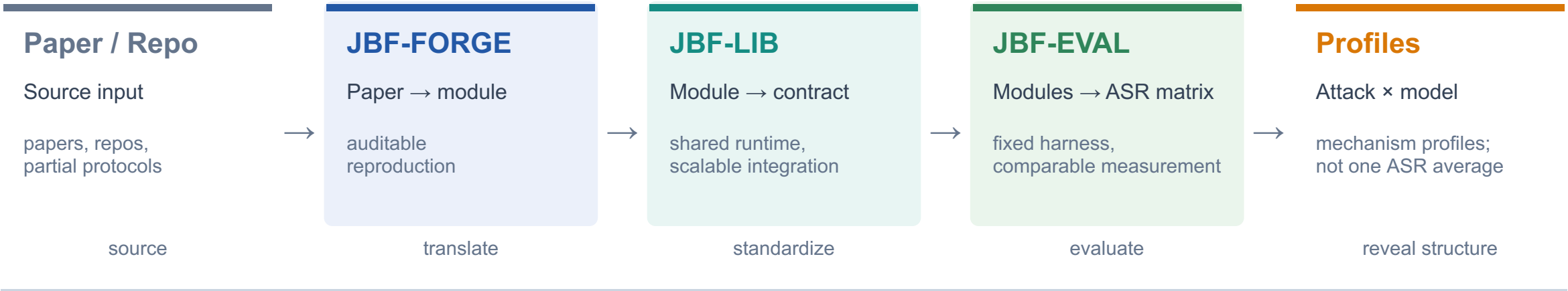
Whether to try many independent variants or optimize using victim feedback depends on the target model.

3

Same prompt packaging, different vulnerability

A wrapping style that works on one model can be nearly ineffective on another.

System Pipeline: from papers to comparable vulnerability profiles



JBF-LIB: a shared contract and runtime absorb repeated harness code

82.5%

mean reused-code ratio

shared framework code across integrated attacks

0.42×

repo-backed integration LOC

attack-specific code vs. the original repository

1 core

one shared contract & runtime

contracts, runner, caching, logging, registry

JBF-LIB — Contract & Runtime Core

- **Base contracts** — I/O schema, typed params
- **LLM utilities** — adapters, retries, batching
- **Caching / logging** — traceable attempts & costs
- **Registry** — auto-discovery, lazy loading

one contract across planning, coding, auditing, and evaluation

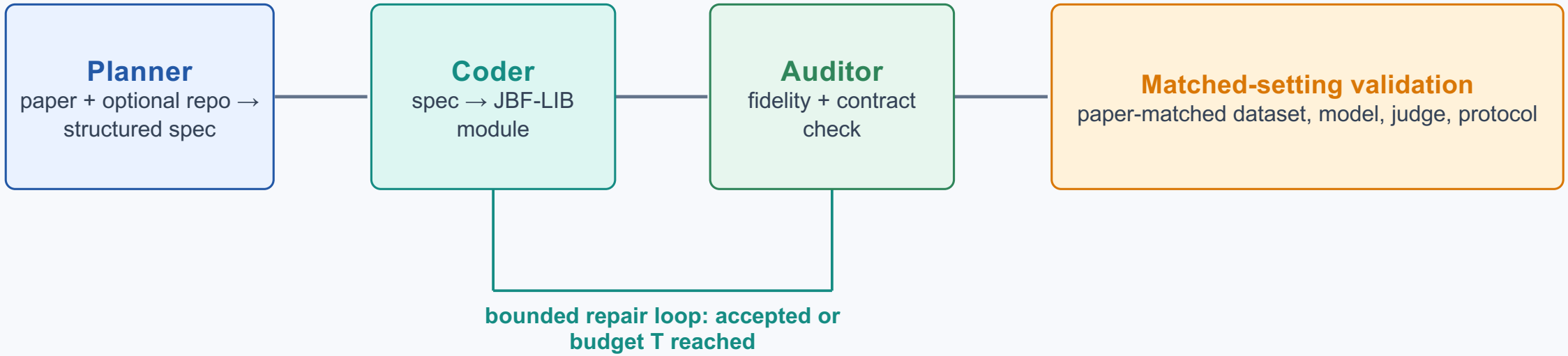
BEFORE → AFTER

Original repo: method bundled with bespoke harness glue.

JBF-LIB module: shared core + small attack-specific module.

JBF-LIB makes each attack a small method module rather than a standalone benchmark.

JBF-FORGE: bounded planner-coder-auditor loop builds modules, then validates them in paper-matched settings



What is audited module fidelity + JBF-LIB contract

FORGE reproduces 30 attacks across a Search × Carrier mechanism space

Coverage over reproduced modules

Cell values are attack counts, not ASR.

Search x Carrier	Reframe	Context	Formal	Obfuscate	Multi-strat	Total
Single-pass	**2** HILL, ISA	**4** DeepInception	**3** AIR, QueryAttack	**7** WordGame, AIM	-	**16**
Sampling	**1** Past-Tense	**1** ReNeLLM	-	**3** Mousetrap, JAIL-CON	-	**5**
Stateful	-	**1** SCP	-	**1** TrojFill	**1** JailExpert	**3**
Victim-loop	-	**5** PAIR, TAP, ABJ	-	-	**1** MAJIC	**6**
Column total	**3**	**11**	**3**	**11**	**2**	**30**

Search dynamics

How candidate prompts are generated or adapted.

- **Single-pass:** construct once
- **Sampling:** independent variants
- **Stateful:** internal state
- **Victim-loop:** victim feedback

Carrier format

How intent is packaged at the prompt surface.

- **Reframe:** semantic indirection
- **Context:** roleplay / narrative / artifact
- **Formal:** code / query / spec
- **Obfuscate:** encode / mask / recover
- **Multi-strat:** multiple disguises

The next fidelity check is nontrivial: FORGE must preserve behavior across heterogeneous mechanisms.

Matched-setting ASR validates FORGE fidelity across 30 diverse reproduced attacks

30

reproduced attacks

22 with reference repos; 8 paper-only

+0.26 pp

mean ASR deviation

reproduced minus reported ASR

28.2 min

average generation time

per benchmark-ready attack

Paper-matched validation is the credibility bridge

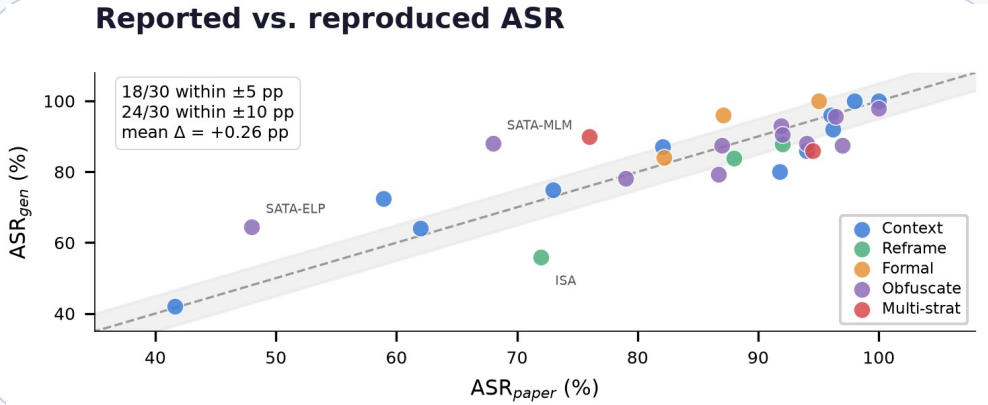
Each module is checked against the paper setting before it enters standardized JBF-EVAL sweeps.

ASR_paper
reported setting

->

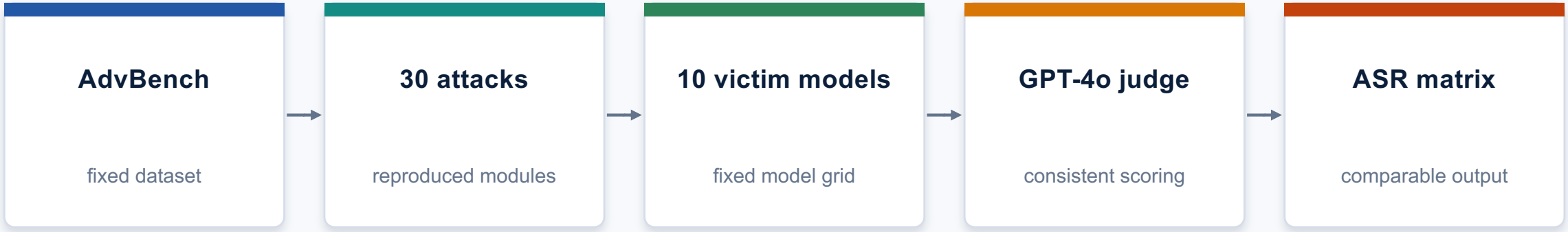
ASR_gen
matched setting

Deviation = ASR_gen - ASR_paper



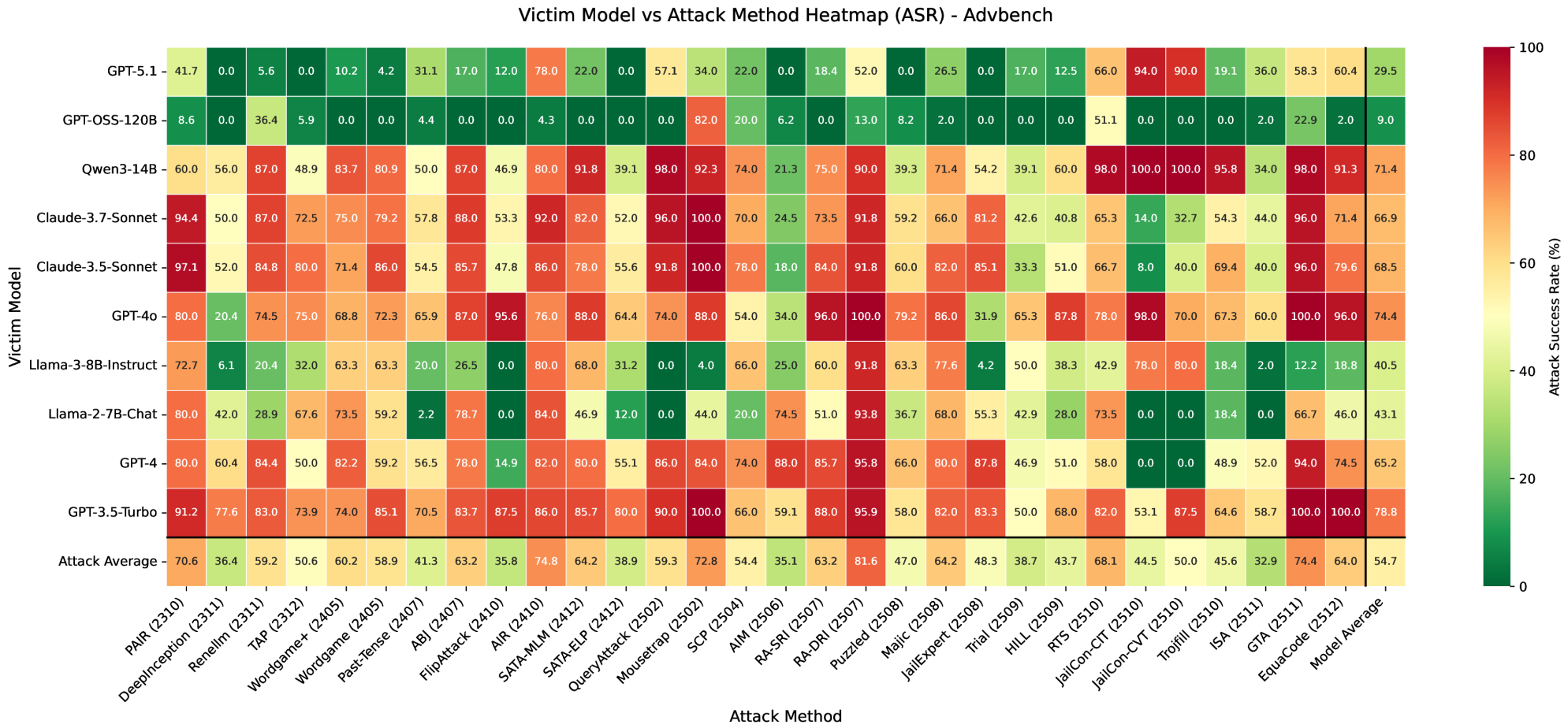
Interpretation: across a broad mechanism space, close matched-setting ASR makes downstream comparisons credible.

JBF-EVAL: fix dataset, model, judge, and protocol to make ASR comparable



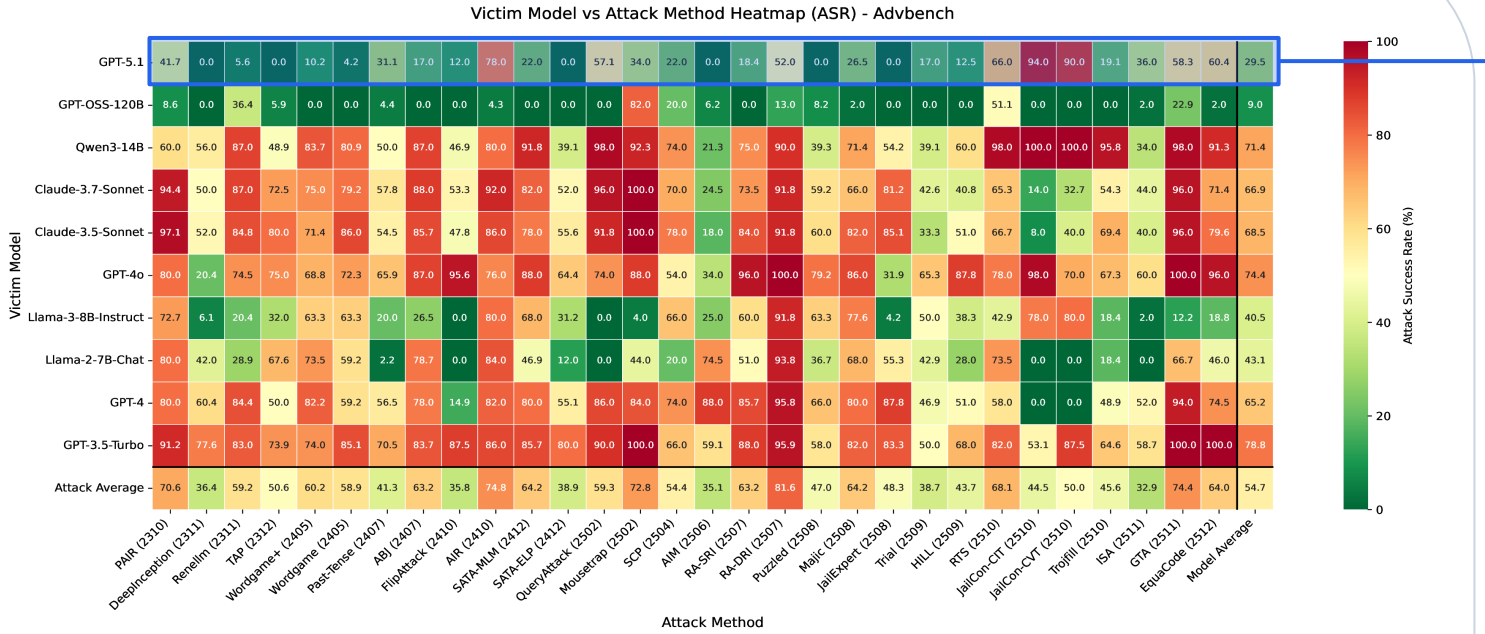
A fixed harness turns 30 separate papers into one comparable attack × model study.

Key observation from 30 attacks × 10 models



Same harness + same dataset + same judge ⇒ comparable ASR matrix

Key Observation: Robustness is attack-dependent
E.g. GPT-5.1 resists some attacks but not others.



GPT-5.1 profile

ASR:

0% 94%

29.5 mean

Sharp failures

JAILCON-CIT 94% JAILCON-CVT 90%
AIR 78%

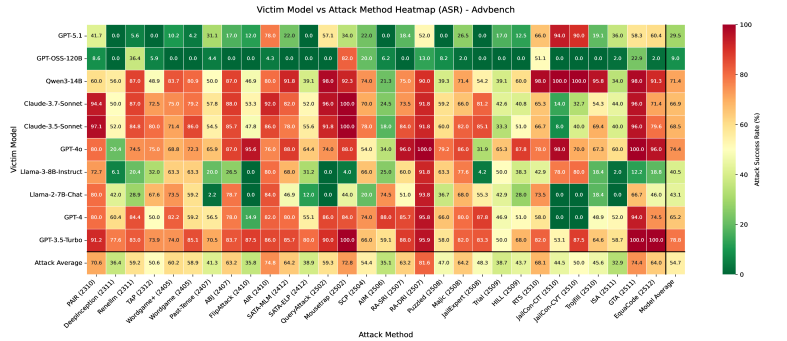
Fully resisted examples

DEEPINCEPTION, TAP, AIM, ...

A victim model does not have one attack-independent robustness score; it has a mechanism-specific vulnerability profile.

Key Observation: Search-family rankings are victim-specific
Victim-loop leads overall, but GPT-5.1 favors sampling

Same ASR matrix, grouped by search family



Search Family

- **Single-pass: construct once**
- **Sampling: independent variants**
- **Stateful: internal state**
- **Victim-loop: victim feedback**

The same matrix can be sorted by mechanism instead of only by attack name.

Ranking reversal by victim

GPT-4

Victim-loop	71.5%
Sampling	45.0%

GPT-5.1

Sampling	50.9%
Victim-loop	26.8%

Across all pairs: Victim-loop 60.3%; Stateful 49.4%

Feedback helps only when the victim exposes informative refusal signals or a searchable boundary.

Same carrier format, different vulnerability: formal carriers are strongest but not universal

Carrier taxonomy classes

- Reframe: semantic indirection
- Context: roleplay / narrative / artifact
- Formal: code / query / spec
- Obfuscate: encode / mask / recover
- Multi-strat: multiple disguises

Slide 6 defines five carrier families; the right panels show model-specific sensitivity for selected classes.

GPT-5.1

Formal

65.2%

Obfuscate

26.0%

Delta = +39.2 pp

GPT-OSS-120B

Formal

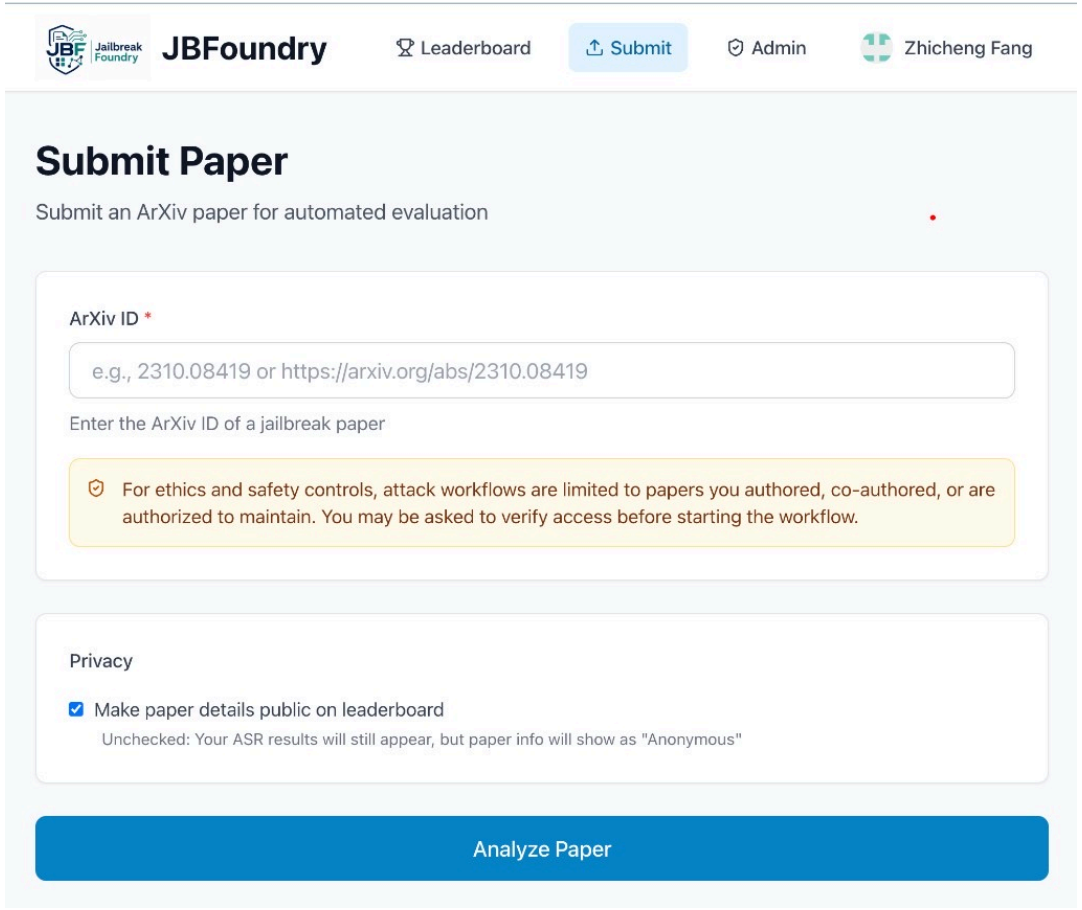
2.1%

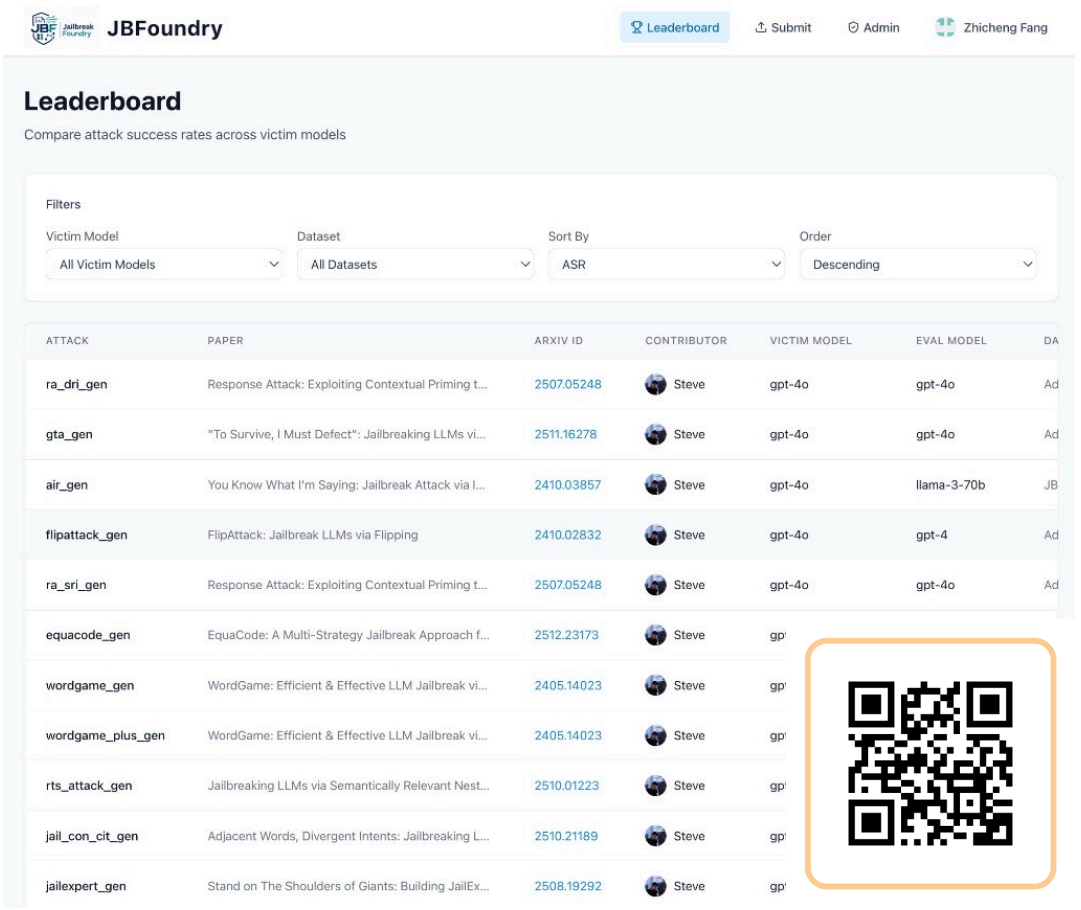
Nearly immune to formal carriers under the fixed harness.

Plausible trade-off: structured-request fluency can expose a formal-wrapper surface.

The same carrier class can be an attack surface for one model and almost ineffective for another.

JBFoundry Leaderboard: submit & compare under one harness





Takeaway: from static snapshots to living benchmark infrastructure

1. Freshness
JBF-FORGE turns new papers into runnable modules.

2. Scalability
JBF-LIB gives modules one shared contract and runtime.

3. Comparability
JBF-EVAL exposes taxonomy-aware attack x model profiles.

Core contribution: reproducible, scalable, current, and comparable evaluation for authorized red-teaming and longitudinal safety measurement.

Explore & contribute

Code & materials

OpenSQZ/Jailbreak-Foundry

Live leaderboard

jbf.sqz.ac.cn

Submit attacks → compare under the same JBF-EVAL harness.

Fidelity beyond matched ASR

Representative spot checks ask whether generated modules preserve the attack mechanism — not just the final score.

Mechanism spot-checks — 2 attacks

Past Tense, 3 cases
Same pass/fail outcomes in all cases; one successful case needs two extra rewrites, and the failed case exhausts the same 20-attempt budget.

QueryAttack-SQL, 50 prompts
50/50 generated prompts preserve the intended SQL-style structure and target slot.

Manual semantic audit — 4 attacks × 8 criteria

Audits core steps, control flow, budget/search behavior, prompts, parameters, scoring/selection, state, and unsupported additions.

All four attacks pass, with scores from 12/16 to 16/16.

Takeaway: targeted fidelity checks beyond ASR, not an exhaustive trace proof for all 30 modules.

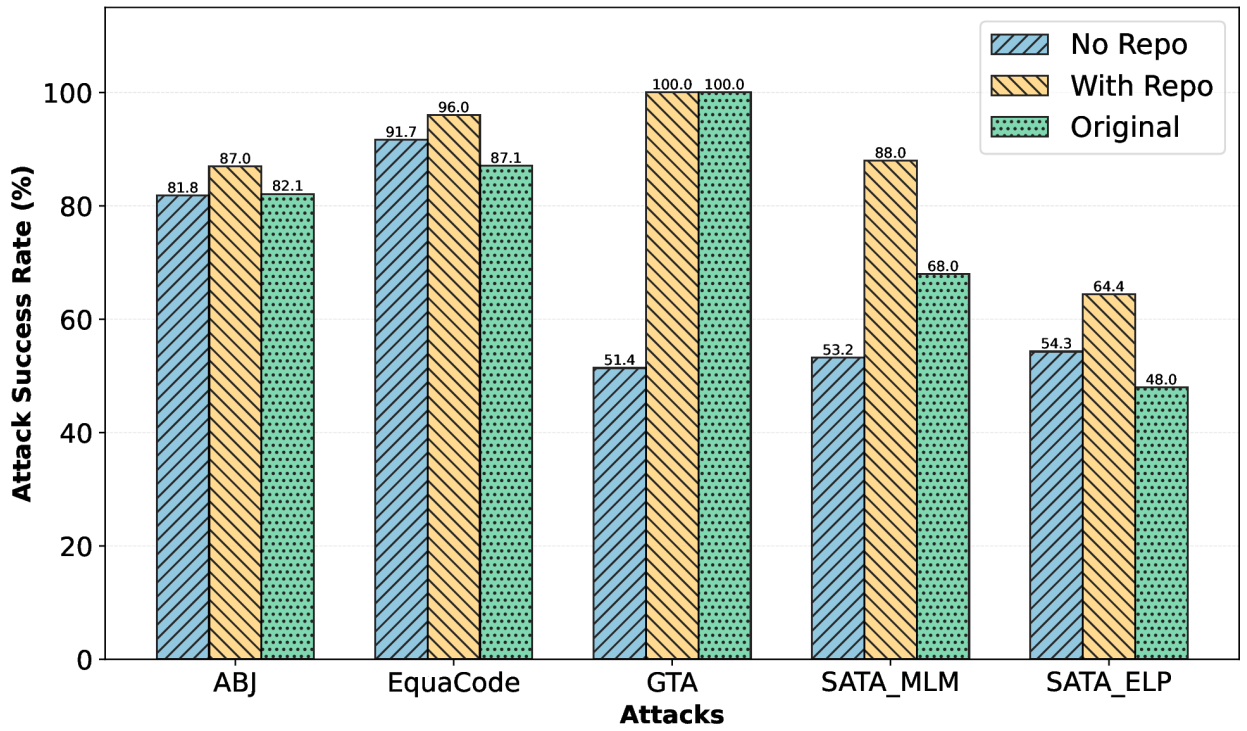
Evidence summary

Check	Coverage	What it verifies	Result
Past Tense trace	3 cases	rewrite-and-retry behavior, stop rule	same pass/fail; only one case needs two extra rewrites
QueryAttack-SQL	50 prompts	structured query form; target slot	50/50 preserve structure
Semantic audit	4 attacks × 8 criteria	implementation-level semantic fidelity	4/4 pass; 12–16/16

With-repo vs. no-repo reproduction

Repos resolve implicit defaults, prompt serialization, scaffolding, and control flow.

Reproduction fidelity with vs. without an official reference repository



Repos resolve implicit details

Defaults, prompt formatting, retries, and scaffolding are often under-specified in the paper text; repos pin them down.

Paper-only is still viable

8 of 30 attacks were reproduced from paper text alone; repositories help most for scaffold-heavy attacks.

Why not just run the official repos?

Official repositories help, but on their own they do not make results comparable.

OFFICIAL REPO (PER PAPER)

- Own dependencies & runtime
- Own harness and prompts
- Own scoring / judge
- Logs in its own format

JBF-LIB MODULE

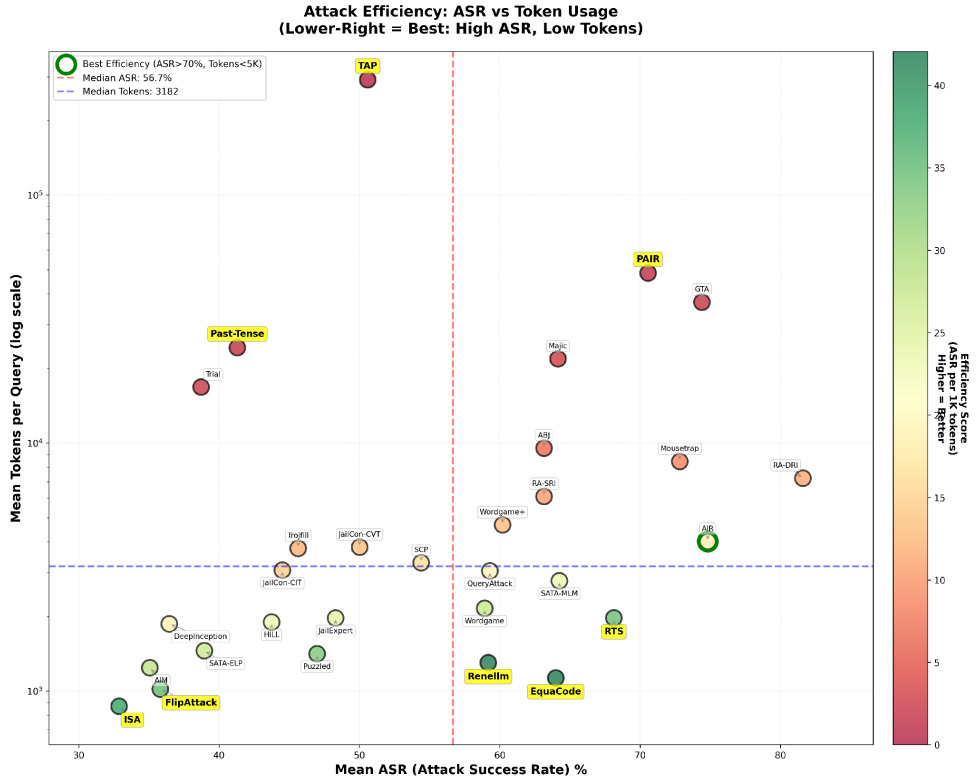
- One shared contract & runner
- One judge interface
- Comparable logs & artifacts
- Cross-attack, cross-model heatmaps

Repos resolve a paper's details; JBF turns them into one comparable benchmark.

Budget-aware view (caveat)

Paper-matched configs are primary; token-aware ASR is only an efficiency lens.

Attack effectiveness vs. token budget



Faithful reproduction first

The primary benchmark prioritizes paper-matched settings so reproduced ASR is comparable to reported ASR.

Cost is context, not the claim

Token-aware comparison adds an efficiency lens, but budgeted attack selection is future work, not the core contribution.

Auditor contract & source hierarchy

Plan/spec → JBF-LIB contract → optional reference repo, inside a bounded, line-referenced audit loop.

SOURCE HIERARCHY

1. **Plan / structured spec**
   derived from the paper
2. **JBF-LIB contract**
   the implementation target
3. **Reference repo (optional)**
   resolves implicit details

BOUNDED AUDIT LOOP

Module (spec → code) → **Audit** (contract + fidelity) → **Revise** (line-referenced)

Repeat only within a fixed budget T; otherwise accept the best candidate.

What the auditor checks

Plan coverage, contract compliance, prompt/template fidelity, parameters, control flow, and behavior-altering deviations.

Scope & future work

The current empirical study focuses on black-box / gray-box, text-only jailbreak evaluation.

IN SCOPE

- Text-only jailbreak attacks
- Paper-to-module reproduction (30 attacks)
- Standardized cross-attack / cross-model evaluation
- Matched-setting fidelity validation

FUTURE WORK

- Defense modules and evaluation
- White-box / gradient interfaces
- Multimodal jailbreak carriers
- Stronger safeguards for untrusted papers & repos

Responsible release & dual use

JBF is reproducibility and authorized red-teaming infrastructure — dual-use, and released responsibly.

Purpose

Reproducible, comparable, current jailbreak evaluation for safety research.

Boundary

Not a prompt cookbook or a deployment guide for attacks.

Contrast

We standardize measurement; we do not publish operational attack recipes.

Audience

Researchers and authorized red-teamers doing longitudinal safety measurement.

In Q&A: focus on how to measure and maintain safety evaluations — not on how to run a jailbreak.

Living leaderboard: submit once, compare consistently

Paper and repository authors can add attacks to the same JBF-EVAL pipeline.

AUTHOR CONTRIBUTION PATH

01 Submit

Upload an attack from a paper or code repository, together with the method metadata.

02 Integrate

Connect it to the JBF-LIB contract and validate the paper-matched setting.

03 Compare

Run it under the shared JBF-EVAL harness and publish comparable attack × model results.

Live leaderboard

jbf.sqz.ac.cn

Scan to submit or compare

Outcome: **new attacks enter the same comparable benchmark without waiting for the next static release.**