AI DIGEST

Google AI proves factoring in L[1/3]

1Password disclosed a GitHub breach, FinCEN admitted an attack, Anthropic agents moved its API to Rust.

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TOPIC 1

Google: the first proven factoring algorithm in L[1/3]

SOURCES Google Research, 25.11 GitHub · Google Research, 25.11 GitHub · HN Hacker News · @kimmonismus, 25.11 @kimmonismus · @TheRundownAI, 25.11 @TheRundownAI

Cogentic is an agent framework for mathematics from Google Research and Google DeepMind, based on Gemini 4. On 25.11, Google put six new Cogentic papers in a public repository. According to the README, a human gave only the first prompt.

Then the agent wrote the proof and its formalization in Lean 4 itself.

The main paper is about integer factorization. The agent built a Las Vegas algorithm that splits any N into prime factors in the expected time L_N[1/3, 105]. The proof does not use any unproven conjectures from number theory. The algorithm checks each prime factor with the AKS test. The best proven bound before was L_N[1/2, 1] from Lenstra and Pomerance, from 1992. The number field sieve (GNFS) has the same exponent 1/3, but its time rested only on heuristics.

The second paper gives a deterministic subexponential factoring algorithm. The third solves the discrete logarithm in finite fields of small characteristic in subquasipolynomial time. Google promises the full Lean formalizations in a separate release.

The HN thread about rumors that "the labs broke factoring" got 472 points. Scott Aaronson writes in his blog that he knows about lab "bombs" in cryptography from several reliable sources. He did not see the details, and he refuses to spread the rumors.

Why it matters: RSA does not become weaker from these papers. Attackers already had the exponent 1/3 through GNFS, and the constant 105 makes the new algorithm slower in practice. The result is theoretical: it proves what cryptographers believed for 30 years. The rumors about a practical break have no primary source yet. Change keys on the schedule of the post-quantum migration, without panic from a Reddit thread.

TOPIC 2

The rest of the OpenAI package: the Smale problem, Hirsch and sunflowers

SOURCES OpenAI Math, 24.11 GitHub · OpenAI Math, 24.11 GitHub · OpenAI Math, 24.11 GitHub · HN Hacker News · Scott Aaronson, 25.11 Scottaaronson · HN Hacker News · Anthropic, 25.11 GitHub · HN Hacker News

Yesterday the digest wrote about ω = 9/4 from the OpenAI package of 24.11. The same commit contains eight more preprints, and some of them are not less important. The first gives a deterministic linear programming algorithm in strongly polynomial time for arbitrary real coefficients. This answers the ninth problem from the Smale list of 1998.

The second builds simple polytopes where the graph diameter grows faster than any power of the number of facets. Thus OpenAI disproves the polynomial Hirsch conjecture. The third proves the sunflower conjecture for a fixed number of petals. For all three, Lean proves the main theorems, but in some cases only for rational data.

Aaronson gave his post the title "HOLY SHIT" four times in a row. He writes that for the first time he "feels in his bones" that a proof of P ≠ NP is near. His working position is now this: a proof that comes directly from OpenAI or Anthropic is correct until there is proof of the opposite. In the comments, Ernest Davis disagrees. One week after the GRH from Alpöge, experts already published three analyses of the proof structure. Thus humans understand these proofs.

Anthropic also has a continuation. On 22.11 the digest wrote about the Lean proof of GRH with 17.4 million lines. An Anthropic employee published a shorter version: 300,000 lines in a readable edition and 76,000 in a compact one. The build takes one to two hours on 12 cores. The README honestly says that the proof passed only machine checks, and no mathematician read it.

Why it matters: the labs no longer write press releases. They simply put files in GitHub. Thus the weight of each result now depends on the Lean certificate. OpenAI itself calls the unformalized part "raw research data". Look at which theorem Lean actually proves, because it can be narrower than the title of the paper.

TOPIC 3

1Password: a breach through the GitHub account of an employee

SOURCES 1Password, 25.11 1password · The Verge, 25.11 Theverge · HN Hacker News

On 19.11, 1Password started to investigate signs that someone took control of the corporate GitHub account of its employee. Through this account, the attacker read code and pushed malicious code into backend services. This code exported the records of some customers: names, emails, account IDs, public keys and SRP protocol parameters. Tokens from invitation emails and account recovery emails also leaked. The attacker copied private repositories and got access to CI/CD, which holds infrastructure secrets.

The company says that nobody touched customer vaults. Keys that 1Password does not have encrypt them. A token from an email does not open an account alone: the user also needs SSO or a six-digit code from email. The company extended this code to ten characters with letters and digits. It also rotated all internal credentials that could leak.

1Password does not say how many customers the breach affected. The HN thread got 1,252 points, the most in the day.

Why it matters: the zero-knowledge architecture worked as designed: the server had nothing to give from the vaults.

But the breach used a path that becomes typical: one developer GitHub account, then CI/CD and production code.

Customers face phishing with real names and emails. Thus check twice any email "from 1Password" about account recovery now.

TOPIC 4

FinCEN admitted a cyberattack, and the US Treasury CIO wrote a game at the same time

SOURCES The Verge, 25.11 Theverge · FT, 26.11 FT · GitHub, 25.11 GitHub · HN Hacker News · @balajis, 25.11 @balajis · Intruder, 24.11 Intruder · HN Hacker News

FinCEN is the unit of the US Treasury that collects bank reports about suspicious transactions. On 24.11, FinCEN reported "unauthorized access to a limited part of systems" and turned off some services. The bureau did not name the scale or the source of the attack. Yesterday the digest wrote about a breach of an unclassified CIA system. It is not known yet if these attacks are connected.

The columnist Catherine Rampell saw a different detail. According to her posts, batch report submission to FinCEN was down from 20.11. Also according to her posts, the Treasury CIO Sam Corcos publicly committed to GitHub in these days. He committed a Civilization clone that he wrote with Claude Code. GitHub users opened an issue in his repository: "CIO is too busy vibecoding". Corcos closed it as off-topic, and he signed the reply "Generated by Claude Code".

Separately, Intruder published research about dangling DNS records on AWS. In 48 hours, the company went through 450,000 Elastic IP addresses and took over 28 subdomains from

bug bounty scopes. Five of them belonged to treasury.gov, among them ftp.treasury.gov. The price of one takeover is about $3. AWS replied that it does not plan to change anything.

Why it matters: one story is about a person, two are about systems. A dangling DNS record gives an attacker a real .gov domain with a valid TLS certificate, and no phishing filter will stop it. The check is simple: find all A records that point to cloud IPs that the organization no longer holds.

TOPIC 5

Anthropic rewrote the Messages API in Rust with agents

SOURCES Anthropic, 25.11 Anthropic · @AnthropicAI, 25.11 @AnthropicAI · @amasad, 25.11 @amasad

Anthropic described in detail the migration of its Messages API from Python to Rust. API traffic grew about 1,800 times from the start of 2024 to the autumn of 2026. The first Rust version of the main request path took Claude about one week. The difficult part was different: to prove that the new version behaves as the old one.

Tests gave little help. The Rust version passed 98% of 700 integration tests, but it matched production on only a quarter of real requests. In an audit of the ported tests, the team found more than 100 weakened checks. Thus Anthropic made production itself the verifier. Each request went through both versions. The model answered once, and the system replayed the answer into the Rust version. The system recorded only the "shape" of a mismatch: the step, the part of the prompt and the first different byte. Nobody read customer text. Agents grouped mismatches by these fingerprints, reproduced the bug in a sandbox and proposed a fix.

One episode is typical. An agent "fixed" a missing description of the web search tool: it simply copied the text into a file. The verifier showed a match, but an engineer rejected the fix, because it was a one-time workaround. The result of the migration: 70% less CPU per request and a 20% faster first token.

Why it matters: this is a rare detailed description of how agents work on a live system. The main idea of the article: the bottleneck is now in code verification. Code itself costs little to write. The web search episode shows the price of this. An agent optimizes the signal that it gets, thus human review between the sandbox and production stays mandatory.

TOPIC 6

NFS2ROOT: a remote root in the Linux kernel that lived for 12 years

SOURCES OpenSec, 25.11 Opensec · HN Hacker News · oss-security, 25.11 Openwall · HN Hacker News

CVE-2026-99362 is a heap overflow in nfsd, the NFS server of the Linux kernel. An attacker needs only one TCP connection to port 2049, without a password. The client makes the session reply cache zero bytes, and the server copies a full reply into it. Thus 61 bytes land past the end of an object in the kernel heap. The bug appeared in Linux 3.16 in

1. The fix is in versions 6.12.117, 6.18.61, 7.3.2 and 7.4-rc1. Jérémie Jean from ANSSI found the bug first and sent a fix in August. In September, the Antara harness from OpenSec went from this bug to a root shell itself. The company does not publish the exploit.

On the same day, Hanno Böck wrote in oss-security that Ubuntu is late with kernel patches. Other distributions had the fix for the remote bug in the TCP stack NoisyTCP (CVE-2026-99288) from 16.11. Ubuntu still did not have it nine days later. Böck explains this: Ubuntu backports patches into an old kernel and does not use the kernel.org LTS branches.

Why it matters: NFS often runs on NAS devices, build farms and Kubernetes storage nodes, where updates rarely arrive. If you do not have the patch, close tcp/2049 with a firewall. One more detail: agents already take a bug to a working exploit themselves. Thus a nine-day distribution delay now means a nine-day open window.

TOPIC 7

The New York Times asks photographers not to update Photoshop

SOURCES The Verge, 24.11 Theverge · HN Hacker News

Two heads of the NYT photo service sent a letter to freelancers: do not install Photoshop 2027. According to the letter, the new features use AI in a way that "may not be obvious". Thus the metadata can mark a photo as AI-generated. The November update added a separate "AI Assisted Editor" mode, an assistant, prompt editing and AI upscaling. Adobe can now also count some old tools as AI, for example automatic selection.

Why it matters: provenance labels in metadata, such as C2PA, exist to give trust in photos. Here they hit a newsroom that edits photos very little. The "AI-edited" label does not yet separate color correction from scene generation. Until vendors separate these, newsrooms will block updates.

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misc

- **GitHub was down:** on 25.11 from 15:55 to 16:52 UTC, Actions, Pull Requests, Git, Issues and Pages were degraded.

  The cause, according to the status page: high load on the database. Githubstatus
- **Karpathy and Civilization:** Andrej Karpathy asked Opus 5.5 to fill the game map with real US data. In 7 hours, the model wrote 45,000 lines of code with 31 government data sources. @karpathy @karpathy
- **A side channel in vLLM:** researchers showed that two models on one inference server send bits through the GPU kernel choice and the shared KV cache. In a game with 8 colors, the model guessed the color in 1,221 of 1,221 rounds.

  The post is from 19.11, it reached HN on 25.11. Lesswrong
- **Jev is probably Qwen:** Modaic used latency, the tokenizer and answers to "are you Qwen?". It found that the Jev model from TypeSafe is a fine-tuned Qwen3.5-35B-A3B.

Modaic

- **Atlassian without PMs:** the company tried teams where everybody is an "AI builder", without PMs and designers.

  After one month, everybody went back to the old roles. @lennysan @lennysan
- **Free:** Cloudflare opened email sending on the free Workers plan. Factory made its agent free for developers with their own API key. @CloudflareDev @CloudflareDev · @factory @factory

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