You are right, and I apologize.

AI and the Future of Mathematics

Thomas Kahle

Otto-von-Guericke-Universität Magdeburg

November 2026

tomkalei@mathe.social

https://thomas-kahle.de

Science & technology | Axioms to grind

Top mathematicians are outraged by OpenAI's methods

24 Fields Medal winners have written a letter of objection

Save Share



September 21, 2026 Company

Advisory Group on Mathematics and Artificial Intelligence

On August 28, we began training a new internal model. In addition to resolving the Navier–Stokes Millennium Prize problem, this model has now resolved more than 100 long-standing open problems across most areas of mathematics. The pace of its progress in mathematics has surprised the mathematicians within OpenAI. This has led to internal discussions on the best way to inform the community of the rapid progress to prepare and adapt the field.

"We mathematicians ..."

DMV · Pressemitteilung · Berlin, 07.10.2026

Kapern einzelne Technologie-Konzerne mittels künstlicher Intelligenz die Mathematik?

mathematik.de

EMS · statement · 10 September 2026

"... at this moment we join in admiration and celebration of this achievement."

euromathsoc.org

Leiden Declaration on Artificial Intelligence and Mathematics

10

Consider carefully which tools to use

Some automated tools and their developers will align with the provisions of this Declaration, while others will not. Consider this when deciding which tools to use, or whether to use them at all. Also consider whether non-proprietary, energy-efficient, or small-scale systems suffice for your task. If not, consider how preservation of the values articulated in this Declaration may be worth a delay in obtaining results.

I, average mathematician.

Short CV

- Math Olympiad medals: 0
- Annals papers: 0
- Fields Medals: 0
- Instruments played: 0
- Physics diplomas: 1
- PhDs in mathematics: 1

A bureaucrat mathematician

Doing research changes the researcher. In this talk I will try to document my personal story with AI. I love computers and have been an early adopter of AI with a mostly positive outlook onto the future.

runt

Doing research changes the researcher. In this talk I will try to document my personal story with AI. I love computers and have been an early adopter of AI with a mostly positive outlook on the future.

rewrite the sentence



I love technology.

Chaos Computer Club

suchen

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Hacker Ethics

What are the ethical principles of hacking - motivation and limits

- Access to computers - and anything which might teach you something about the way the world really works - should be unlimited and total. Always yield to the Hands-On Imperative!
- All information should be free.
- Mistrust authority - promote decentralization.
- Hackers should be judged by their acting, not bogus criteria such as degrees, age, race, or position.
- You can create art and beauty on a computer.
- Computers can change your life for the better.
- Don't litter other people's data.
- Make public data available, protect private data.

Open today

Chaostreff Alzey
Sun 15:00

Tags

hackerethik hacker

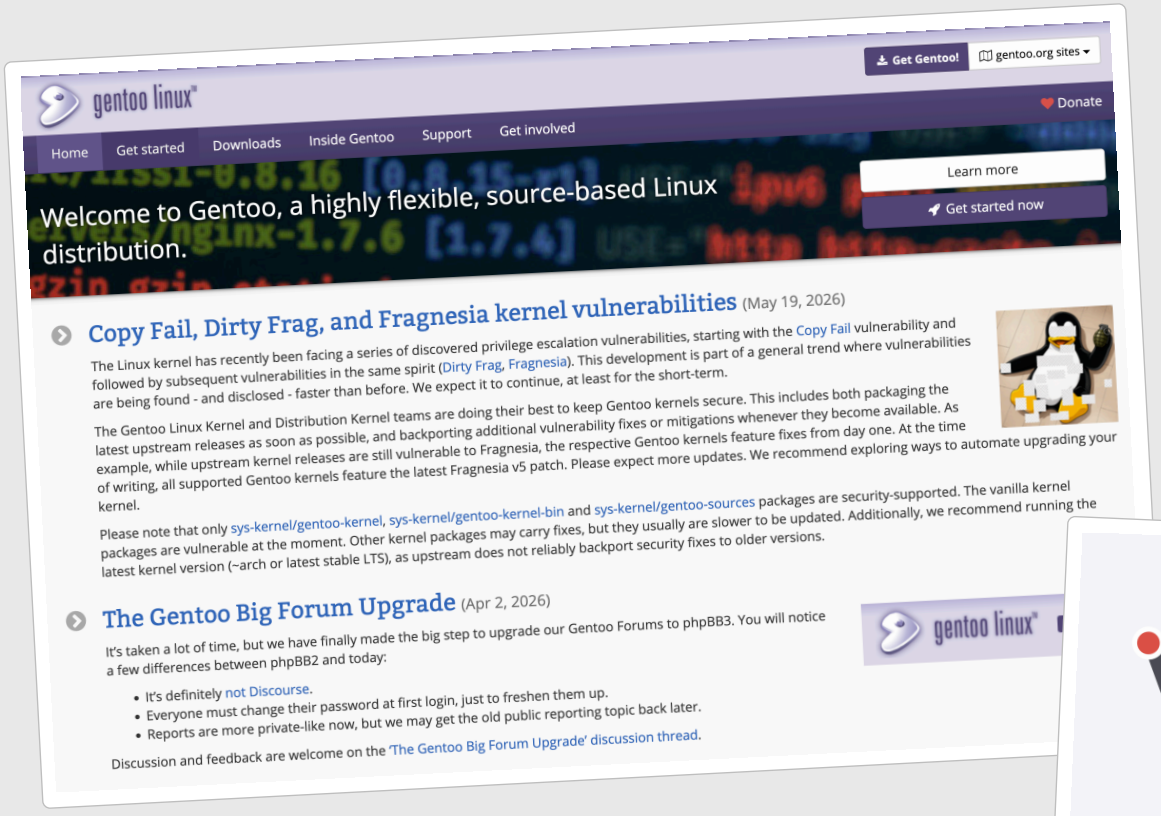
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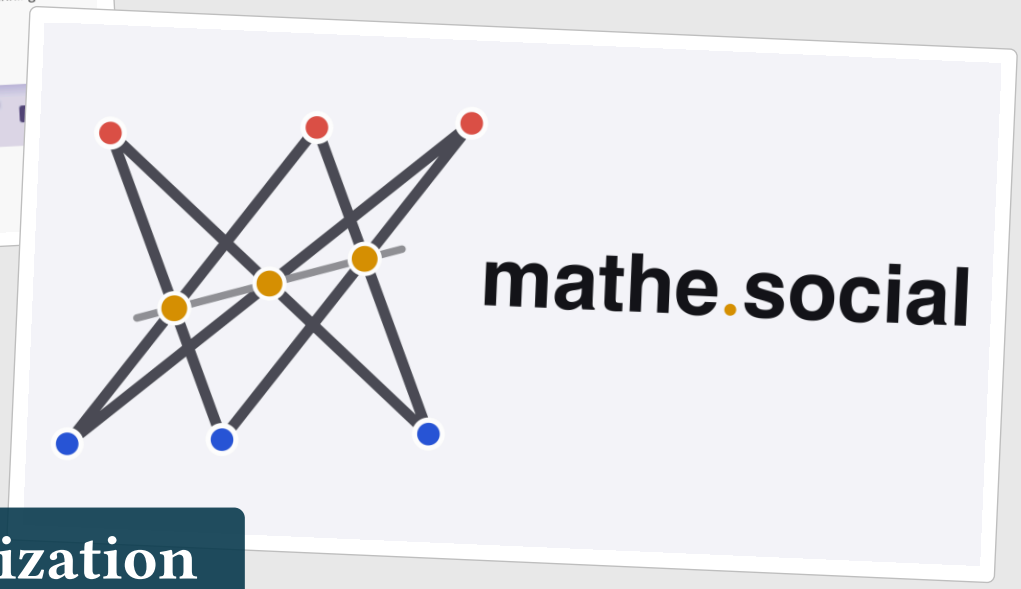
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media.ccc.de

ds.

Hacker ethics





Open source · Privacy · Decentralization

“Let’s unpack this.”





?


Meta AI with Voice



I want to see for myself.

Jan 2023 · first chatGPT



meinst du indisch oder indianisch?

Ich meinte tatsächlich indisch. Die Null wurde ursprünglich von den alten Indianern verwendet und hat ihren Ursprung in der indischen Zahlenschrift. Es tut mir leid, wenn ich mich in meinem Essay falsch ausgedrückt habe. Indianisch ist ein Begriff, der oft verwendet wird, um die Ureinwohner Nordamerikas zu beschreiben, die auch als Indianer bezeichnet werden. Ich hoffe, dass diese Erklärung hilft, meinen Fehler zu korrigieren.

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Apr 2023 · Whisper transcribes the archive

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$ whisper EIG001.wav
[00:00.000 --> 00:07.060] Ja, hallo
zusammen an den Empfangsgeräten. Hier ist
der Eigenraum, ein neuer Mathe-Podcast
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2023 · Eigenraum



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2023 · Eigenraum

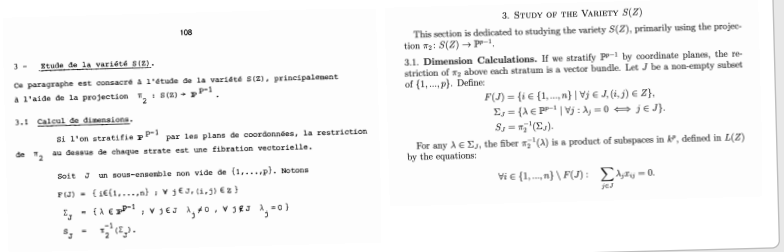


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"Great catch!"

Feb 2025 · typewriter → LaTeX



108

3 — Etude de la variété S(Z).

Ce paragraphe est consacré à l'étude de la variété S(Z), principalement à l'aide de la projection $\pi_2 : S(Z) \to \mathbb{P}^{p-1}$.

3.1 Calcul de dimensions.

Si l'on stratifie $\mathbb{P}^{p-1}$ par les plans de coordonnées, la restriction de π_2 au dessus de chaque strate est une fibration vectorielle.

Soit J un sous-ensemble non vide de $\{1,\dots,p\}$. Notons

$F(J) = \{ i \in \{1,\dots,n\} \mid \forall j \in J, (i,j) \in Z \}$

$\Sigma_J = \{ \lambda \in \mathbb{P}^{p-1} \mid \forall j \in J \ \ \lambda_j \neq 0 \ , \ \forall j \notin J \ \ \lambda_j = 0 \}$

$S_J = \pi_2^{-1}(\Sigma_J)$.

3. Study of the Variety $S(Z)$

This section is dedicated to studying the variety $S(Z)$, primarily using the projection $\pi_2 \colon S(Z) \to \mathbb{P}^{p-1}$.

3.1. **Dimension Calculations.** If we stratify $\mathbb{P}^{p-1}$ by coordinate planes, the restriction of π_2 above each stratum is a vector bundle. Let J be a non-empty subset of $\{1,\dots,p\}$. Define:

$$F(J) = \{i \in \{1,\dots,n\} \mid \forall j \in J, (i,j) \in Z\},$$
$$\Sigma_J = \{\lambda \in \mathbb{P}^{p-1} \mid \forall j : \lambda_j = 0 \iff j \in J\}.$$
$$S_J = \pi_2^{-1}(\Sigma_J).$$

For any $\lambda \in \Sigma_J$, the fiber $\pi_2^{-1}(\lambda)$ is a product of subspaces in k^n, defined in $L(Z)$ by the equations:

$$\forall i \in \{1,\dots,n\} \setminus F(J) : \quad \sum_{j \in J} \lambda_j x_{ij} = 0.$$

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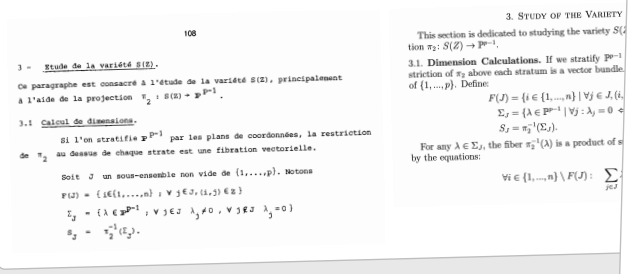


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"Great catch!"

Feb 2025 · typewriter → LaTeX



108

3 - Etude de la variété S(Z).

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3.1 Calcul de dimensions.

Si l'on stratifie $\mathbb{P}^{p-1}$ par les plans de coordonnées, la restriction de π_2 au dessus de chaque strate est une fibration vectorielle.

Soit J un sous-ensemble non vide de $\{1,\dots,p\}$. Notons

$$F(J) = \{ i \in \{1,\dots,n\} \; ; \; \forall\, j \in J, (i,j) \in Z \}$$

$$\Sigma_J = \{ \lambda \in \mathbb{P}^{p-1} \; ; \; \forall\, j \in J \;\; \lambda_j \neq 0 \, , \; \forall\, j \notin J \;\; \lambda_j = 0 \}$$

$$S_J = \pi_2^{-1}(\Sigma_J).$$

3. Study of the Variety

This section is dedicated to studying the variety $S(Z)$ tion $\pi_2 : S(Z) \to \mathbb{P}^{p-1}$.

3.1. **Dimension Calculations.** If we stratify $\mathbb{P}^{p-1}$ striction of π_2 above each stratum is a vector bundle. of $\{1,\dots,p\}$. Define:

$$F(J) = \{ i \in \{1,\dots,n\} \mid \forall j \in J, (i,$$

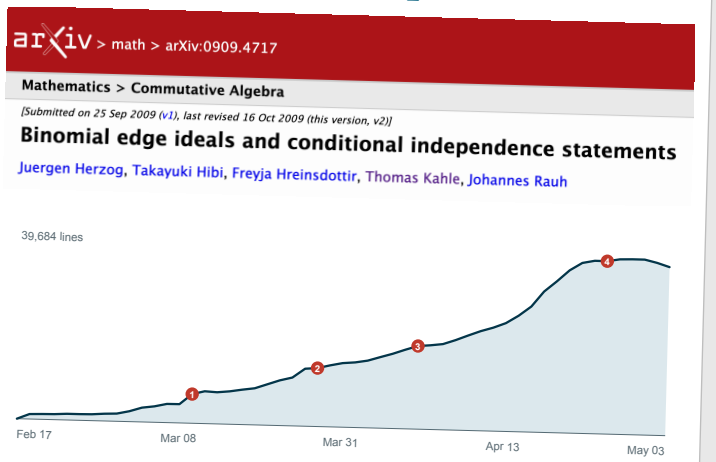
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Feb–Apr 2026 · my paper in Lean



arXiv > math > arXiv:0909.4717

Mathematics > Commutative Algebra

[Submitted on 25 Sep 2009 (v1), last revised 16 Oct 2009 (this version, v2)]

Binomial edge ideals and conditional independence statements

Juergen Herzog, Takayuki Hibi, Freyja Hreinsdottir, Thomas Kahle, Johannes Rauh

39,684 lines

Feb 17 · Mar 08 · Mar 31 · Apr 13 · May 03

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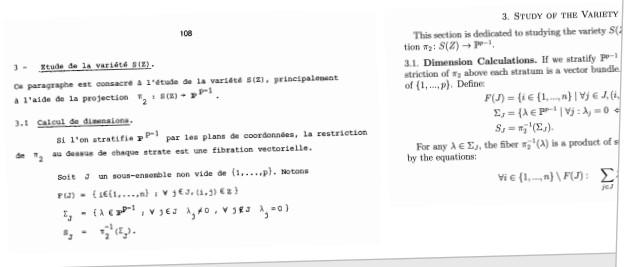
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Feb 2025 · typewriter → LaTeX



108

3 — Étude de la variété $S(\Sigma)$.

Ce paragraphe est consacré à l'étude de la variété $S(\Sigma)$, principalement à l'aide de la projection $\pi_2 : S(\Sigma) \to \mathbb{P}^{p-1}$.

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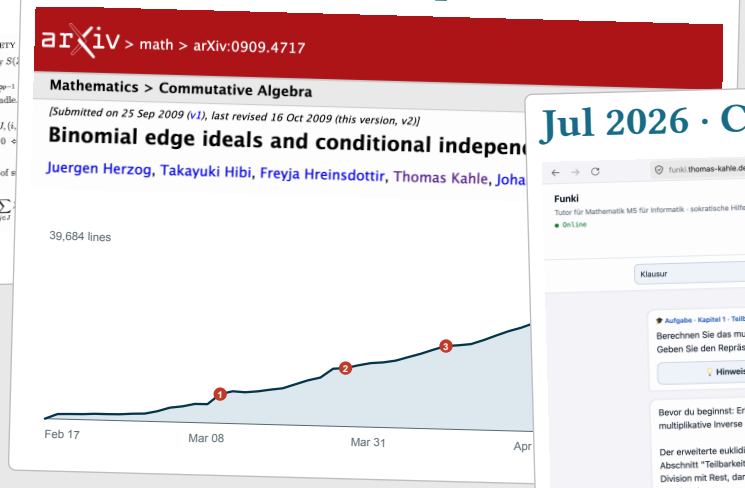
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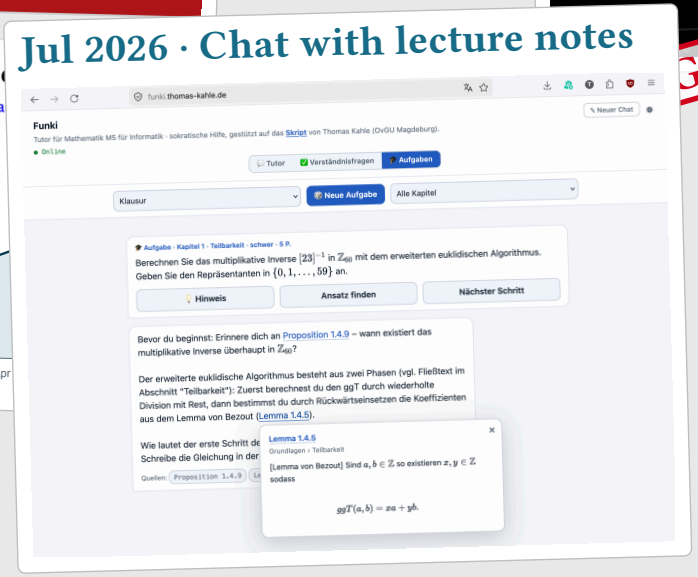
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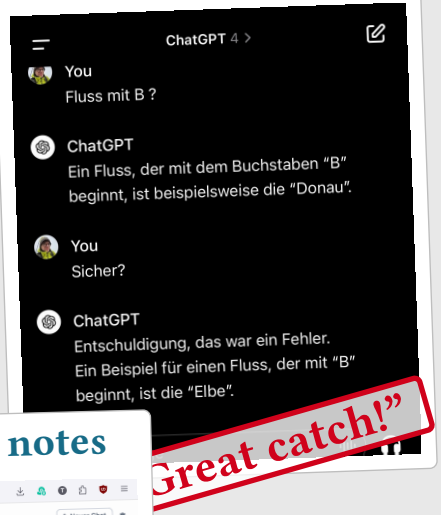
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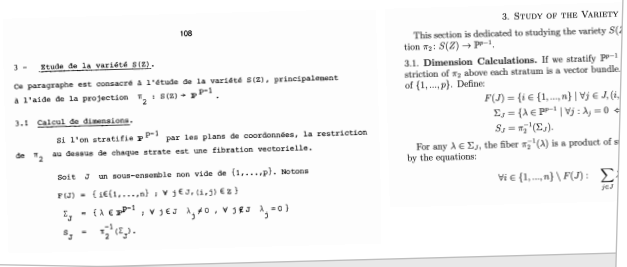
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108

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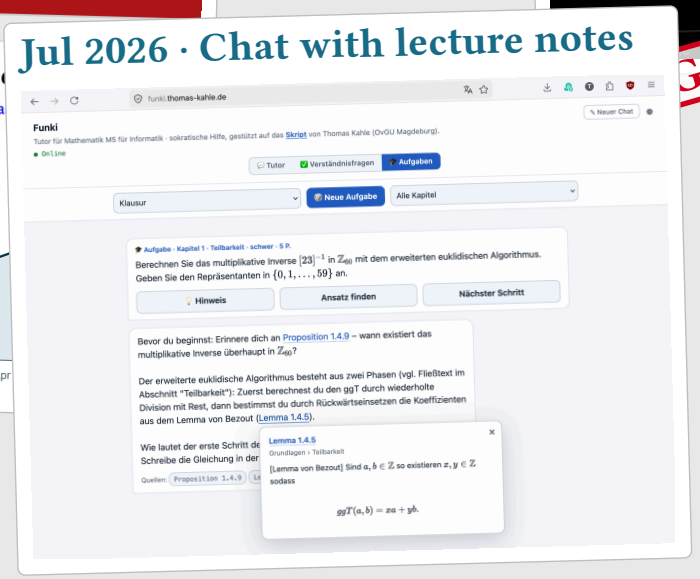
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May 2026 · Leanstral



Jul 2026 · Chat with lecture notes



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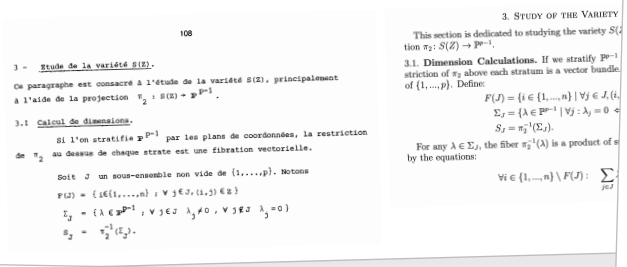
2023 · Eigenraum



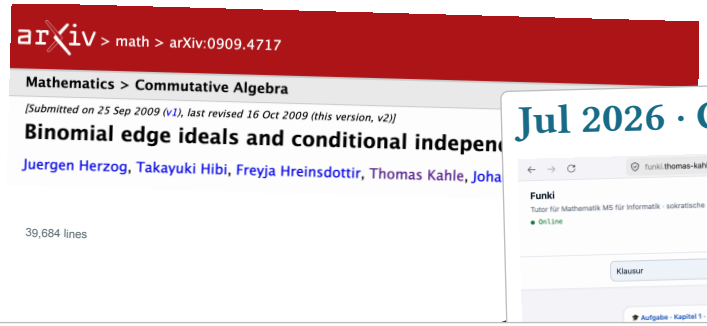
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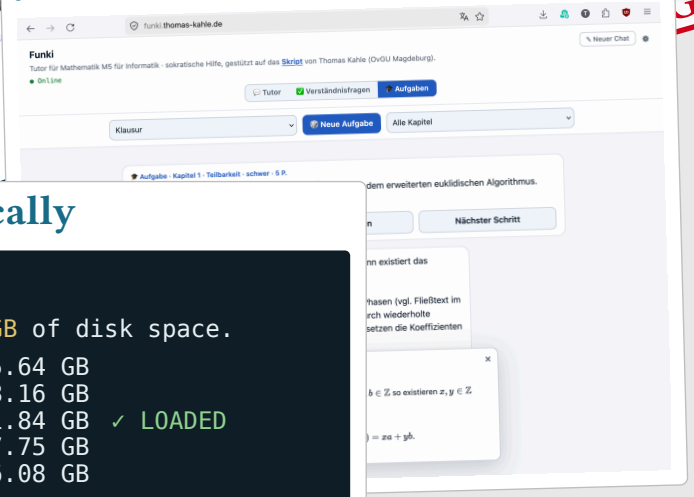
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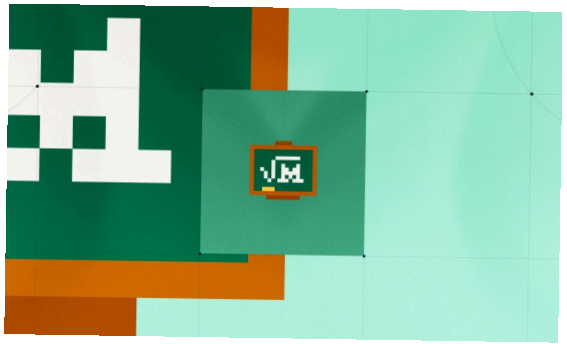
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Jul 2026 · Chat with lecture notes



May 2026 · Leanstral



2026 · local models, systematically

```
$ lms ls
You have 9 models, taking up 190.69 GB of disk space.
google/gemma-4-26b-a4b-qat      26B  15.64 GB
meta/muse-glimmer               28B  18.16 GB
nvidia/nemotron-3.5-super-vl   120B  71.84 GB  ✓ LOADED
qwen/qwen3.6-35b-a3b            35B  37.75 GB
qwen/qwen3.8-27b                27B  16.08 GB
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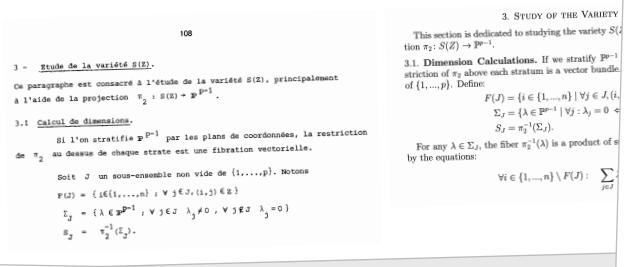
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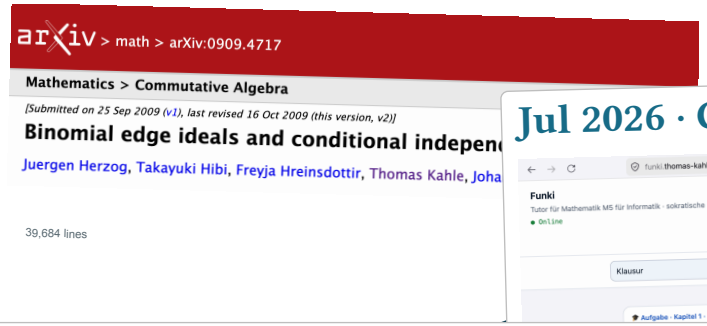
Feb 2024 · Stadt Land Fluss



Feb 2025 · typewriter → LaTeX



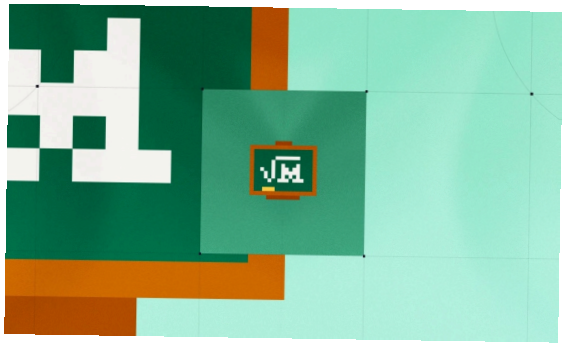
Feb–Apr 2026 · my paper in Lean



Jul 2026 · Chat with lecture notes



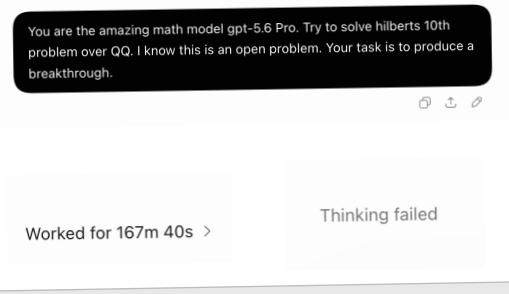
May 2026 · Leanstral



2026 · local models, systematically

```
$ lms ls
You have 9 models, taking up 190.69 GB of disk space.
google/gemma-4-26b-a4b-qat      26B  15.64 GB
meta/muse-glimmer               28B  18.16 GB
nvidia/nemotron-3.5-super-vl   120B  71.84 GB  ✓ LOADED
qwen/qwen3.6-35b-a3b            35B  37.75 GB
qwen/qwen3.8-27b                27B  16.08 GB
```

Aug 2026 · AI Paper



“Load bearing”

```
66784 kahle     20   0 57680 46056 11668 R 100.  0.0  1:17.95 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66794 kahle     20   0 57680 46032 11668 R 100.  0.0  1:17.95 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66799 kahle     20   0 57680 46004 11644 R 100.  0.0  1:17.94 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66804 kahle     20   0 57680 46008 11620 R 100.  0.0  1:17.94 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66824 kahle     20   0 57680 45800 11420 R 100.  0.0  1:17.93 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66844 kahle     20   0 57680 45928 11544 R 100.  0.0  1:17.93 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66849 kahle     20   0 57680 45756 11364 R 100.  0.0  1:17.92 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66869 kahle     20   0 57680 45860 11516 R 100.  0.0  1:17.91 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66894 kahle     20   0 57680 45988 11628 R 100.  0.0  1:17.89 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66904 kahle     20   0 57680 45948 11608 R 100.  0.0  1:17.88 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66919 kahle     20   0 57680 46024 11660 R 100.  0.0  1:17.88 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66924 kahle     20   0 57680 46084 11704 R 100.  0.0  1:17.87 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66929 kahle     20   0 57680 46084 11692 R 100.  0.0  1:17.86 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66939 kahle     20   0 57680 46112 11744 R 100.  0.0  1:17.86 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66944 kahle     20   0 57680 46032 11684 R 100.  0.0  1:17.86 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66964 kahle     20   0 57680 46012 11624 R 100.  0.0  1:17.85 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66970 kahle     20   0 57680 46076 11692 R 100.  0.0  1:17.84 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66974 kahle     20   0 57680 46044 11656 R 100.  0.0  1:17.84 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66979 kahle     20   0 57680 46000 11644 R 100.  0.0  1:17.83 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66983 kahle     20   0 57680 46040 11660 R 100.  0.0  1:17.84 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
66994 kahle     20   0 57680 46044 11656 R 100.  0.0  1:17.83 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
67039 kahle     20   0 57680 46036 11668 R 100.  0.0  1:17.80 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
67060 kahle     20   0 57680 45956 11576 R 100.  0.0  1:17.78 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
67064 kahle     20   0 57680 45748 11372 R 100.  0.0  1:17.78 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
67074 kahle     20   0 57680 46088 11704 R 100.  0.0  1:17.78 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
67083 kahle     20   0 57680 45920 11556 R 100.  0.0  1:17.77 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
67087 kahle     20   0 57680 46016 11660 R 100.  0.0  1:17.77 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
67107 kahle     20   0 57680 46052 11660 R 100.  0.0  1:17.75 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
67112 kahle     20   0 57680 46028 11652 R 100.  0.0  1:17.74 python3 -u scripts/harv                                                    ssoids
67123 kahle     20   0 57680 46048 11684 R 100.  0.0  1:17.73 python3 -u scripts/harv                                                    ssoids
67127 kahle     20   0 57680 45968 11572 R 100.  0.0  1:17.74 python3 -u scripts/harv                                                    ssoids
67132 kahle     20   0 57680 45900 11512 R 100.  0.0  1:17.73 python3 -u scripts/harv                                                    ssoids
67187 kahle     20   0 57680 45904 11504 R 100.  0.0  1:17.68 python3 -u scripts/harv                                                    ssoids
67201 kahle     20   0 57680 46056 11680 R 100.  0.0  1:17.66 python3 -u scripts/harv                                                    ssoids
67290 kahle     20   0 57680 45916 11564 R 100.  0.0  1:12.07 python3 -u scripts/harv                                                    ssoids
67294 kahle     20   0 57680 46036 11652 R 100.  0.0  1:12.06 python3 -u scripts/harv                                                    ssoids
67309 kahle     20   0 57680 45840 11476 R 100.  0.0  1:12.00 python3 -u scripts/harv                                                    ssoids
67314 kahle     20   0 57680 45964 11612 R 100.  0.0  1:11.95 python3 -u scripts/harv                                                    ssoids
67319 kahle     20   0 57680 46024 11636 R 100.  0.0  1:11.88 python3 -u scripts/harv                                                    ssoids
67334 kahle     20   0 57680 45912 11524 R 100.  0.0  1:11.84 python3 -u scripts/harv                                                    ssoids
67339 kahle     20   0 57680 46064 11680 R 100.  0.0  1:11.83 python3 -u scripts/harv                                                    ssoids
67344 kahle     20   0 57680 46072 11688 R 100.  0.0  1:11.73 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
67361 kahle     20   0 57680 45920 11556 R 100.  0.0  1:11.23 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
67371 kahle     20   0 57680 45868 11472 R 100.  0.0  1:11.15 python3 -u scripts/harvest_composition_chain_parametrizations.py --database data/gaussoids
```



Thomas Kahle

@tomkalei

Make it so! 🤩

17 Aug 2026

Auphonic

PRODUCTION

EIG066 Natürliche Intelligenz (mit Johannes)

Eigenraum mit Gast | Reapply Preset

Personal preset: Eigenraum mit Gast (edit)

TRACKS & ALGORITHMS

Intro · Filtering, Music Leveler*	EIG066-Multitrack-v2-01-Thomas.flac	×
Tom · Filtering, Denoise, Speech Leveler*	EIG066-Multitrack-v2-03-Tom (FLAC auf WAV).flac	×
Johannes · Filtering, Speech Leveler*	EIG066-Multitrack-v2-04-Johannes (Rest aus WAV).flac	×

+ Add Track | Import Multiple Tracks

Intro / Outro

MASTER

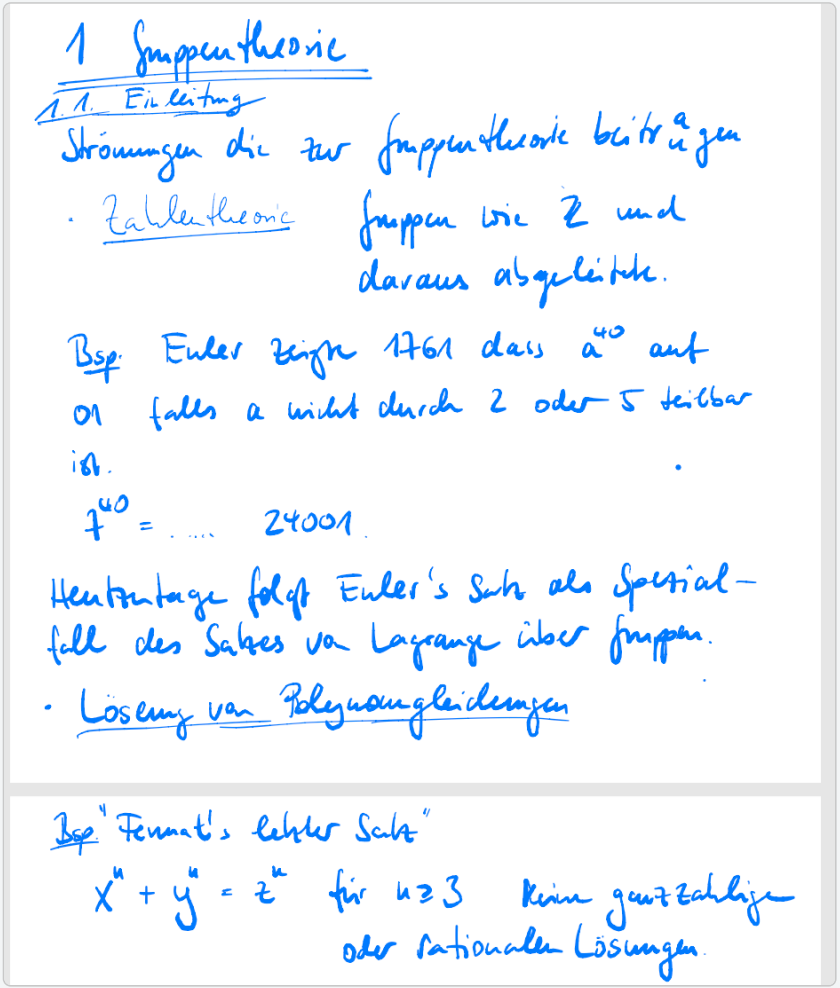
Master Audio Algorithms · Leveler, Gate, DeBleed, Loudnorm, Cutting

Speech Recognition and Automatic Shownotes · Whisper, German, Shownotes

METADATA

Basic Metadata · Docs ↗

Much, much more efficient.



1 Gruppentheorie

1.1. Einleitung

Strömungen die zur Gruppentheorie beitragen

- Zahlentheorie — Gruppen wie $\mathbb{Z}$ und daraus abgeleitete.

Bsp. Euler zeigte 1761 dass a^{40} auf 01 endet falls a nicht durch 2 oder 5 teilbar ist.

$7^{40} = \ldots 24001$

Heutzutage folgt Euler's Satz als Spezialfall des Satzes von Lagrange über Gruppen.

- Lösung von Polynomgleichungen

Bsp "Fermat's letzter Satz"

$x^n + y^n = z^n$ für $n \geq 3$ keine ganzzahligen oder rationalen Lösungen.



1 Gruppentheorie

1.1 Einleitung

Der Begriff der Gruppe ist aus mehreren Strömungen der Mathematik entstanden, die zunächst wenig miteinander zu tun hatten. Wir stellen drei davon kurz vor. VL1

Zahlentheorie
In der Zahlentheorie hat man es mit Gruppen wie $\mathbb{Z}$ und daraus abgeleiteten Gruppen zu tun, zum Beispiel mit den Restklassen modulo n.

Beispiel 1.1.1: Euler zeigte 1761, dass a^{40} auf die Ziffern 01 endet, falls a eine ganze Zahl ist, die weder durch 2 noch durch 5 teilbar ist. Zum Beispiel ist

$$7^{40} = 6366805760909027985741435139224001.$$

In moderner Sprache besagt Eulers Satz, dass $a^{40} \equiv 1 \bmod 100$ für alle zu 10 teilerfremden a gilt. Heutzutage folgt er als Spezialfall des Satzes von Lagrange über Gruppen, den wir in diesem Kapitel beweisen werden: Die zu 100 teilerfremden Restklassen bilden eine Gruppe mit 40 Elementen.

Beispiel 1.1.2: Der *große Satz von Fermat* besagt, dass die Gleichung

$$x^n + y^n = z^n$$

für $n \geq 3$ keine ganzzahligen Lösungen mit $xyz \neq 0$ hat (und damit auch keine rationalen). Fermat notierte die Aussage um 1637, bewiesen wurde sie erst 1994 von Andrew Wiles. Der Beweis benutzt in wesentlicher Weise Gruppen, die aus elliptischen Kurven entstehen.

Beispiel 1.1.3: Eine *elliptische Kurve* ist (für uns) die Lösungsmenge einer Gleichung wie

$$y^2 = x^3 - 2x.$$

Diese Kurve hat unendlich viele rationale Punkte, zum Beispiel $(0,0)$, $(-1,1)$ und $(2,2)$. Schon im 17. Jahrhundert war Folgendes bekannt: Verbindet man zwei rationale Punkte der Kurve durch eine Gerade und schneidet diese mit der Kurve, so erhält man einen dritten Punkt, der wieder rational ist und auf der Kurve liegt. Die Gerade durch $P = (0,0)$ und $Q = (2,2)$ ist zum Beispiel $y = x$. Setzt man sie in die Kurvengleichung ein, erhält man $x^3 - x^2 - 2x = x(x-2)(x+1) = 0$. Neben

Algebra lecture notes · **with** AI · **30 min**

Sharpening the knives

```
$ head ~/sente/AGENTS.md
```

The name is the Go term for *initiative* — […] the assistant's job is to help the user keep sente over their work instead of reacting to inbox, calendar, and Todoist pressure.

```
$ grep '^- ' ~/sente/AGENTS.md
```

DEVONthink 4 · articles (~1660 PDFs) · Todoist · Calendar · Nextcloud · Apple Notes · Thunderbird (Mail)

```
$ grep -i 'read' ~/sente/AGENTS.md
```

2. Reads are unrestricted.

Thunderbird (Mail) […] Read freely; to write, open a compose window […] without asking first

Make no mistakes and write like a human

latex-style/SKILL.md

- **No runts.** No paragraph may end in a very short last line (a lone word or a fragment such as “10th problem.”). Rewrite or tighten the final sentence until the last rendered line is reasonably full […]. Fix runts by rewriting prose, not by TeX tricks.

```
ab19c65 2026-09-30
Folie 3 – Umbruch der Buchempfehlung
behoben
Co-Authored-By: Claude

33759e9 2026-10-02
Zeilenumbruch und ‘odd degree terms’
auf ‘Exponents become coefficients’
Co-Authored-By: Claude
```

Refereeing, with a coding agent.

```
> Help me understand the algorithm in Section 3 of the submission.
```

- I implemented the algorithm and ran all 7 examples from the paper.
- Bash(python3 run_examples.py)
  └ Example 1 output matches the paper
    Example 2 output differs from the paper
    Example 3 output matches the paper
    Example 4 output differs from the paper
    Example 5 output differs from the paper
    Example 6 output matches the paper
    Example 7 output differs from the paper
- 4 of 7 examples give different outputs. The algorithm as written cannot produce the outputs in the paper — and the implementation the authors describe cannot be doing what they claim.

  Want me to write the referee report and email it to the editors? I could also write the paper the authors meant to write.

“Wait — actually, …”

Where does this lead?

Stupid forms

Where does this lead?

Stupid forms

Managing calendar

Where does this lead?

Stupid forms

Managing calendar

Learning number theory

Where does this lead?

Stupid forms

Managing calendar

Learning number theory

Translating

Where does this lead?

Stupid forms

Managing calendar

Learning number theory

Translating

Office automation

Where does this lead?

Stupid forms

Managing calendar

Learning number theory

Translating

Office automation

Programming

Where does this lead?

Stupid forms

Managing calendar

Learning number theory

Translating

Office automation

Programming

Solving Jacobian conjecture

Where does this lead?

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Office automation

Programming

Solving Jacobian conjecture

Lecture notes

Where does this lead?

Stupid forms

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Office automation

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Solving Jacobian conjecture

Lecture notes

Creating slides

Where does this lead?

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Office automation

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Solving Jacobian conjecture

Lecture notes

Creating slides

Exploring literature

Where does this lead?

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Translating

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Creating slides

Exploring literature

Creating exam questions

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Refereeing papers

Writing papers

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Programming

Solving Jacobian conjecture

Lecture notes

Creating slides

Exploring literature

Creating exam questions

Abstracts

Grading exams

Refereeing papers

Writing papers

Thinking?

Thinking fast and slow

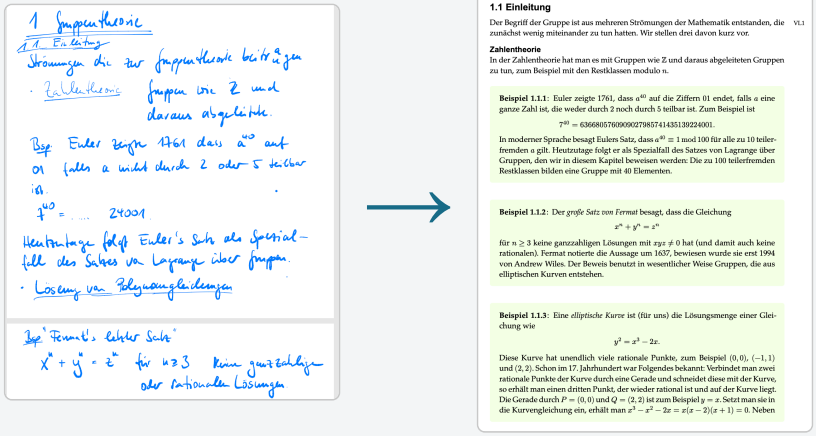
Doing research changes the researcher. In this talk I will try to document my personal story with AI. I love computers and have been an early adopter of AI with a mostly positive outlook onto the future. Recently the picture has become a lot more grim. This has two reasons. The first is that it is becoming clearer every day how we simply cannot extend the trust that we naturally have between mathematicians also to big tech. The second reason is that I observe changes in myself that I don't like. I used to say that writing is thinking and I still believe it is true. But I also outsourced a lot of writing to the machine, feeding it notes and unfinished thoughts and then editing the result to sound more like me. For certain texts (like bureaucratic letters) this is certainly an efficient and acceptable way to proceed, but for my core thinking I want to learn to accept that this is a slow and messy human process.

Abstract of this talk · **without** AI · **30 min**

Thinking fast and slow

Doing research changes the researcher. In this talk I will try to document my personal story with AI. I love computers and have been an early adopter of AI with a mostly positive outlook onto the future. Recently the picture has become a lot more grim. This has two reasons. The first is that it is becoming clearer every day how we simply cannot extend the trust that we naturally have between mathematicians also to big tech. The second reason is that I observe changes in myself that I don't like. I used to say that writing is thinking and I still believe it is true. But I also outsourced a lot of writing to the machine, feeding it notes and unfinished thoughts and then editing the result to sound more like me. For certain texts (like bureaucratic letters) this is certainly an efficient and acceptable way to proceed, but for my core thinking I want to learn to accept that this is a slow and messy human process.

Abstract of this talk · **without** AI · **30 min**

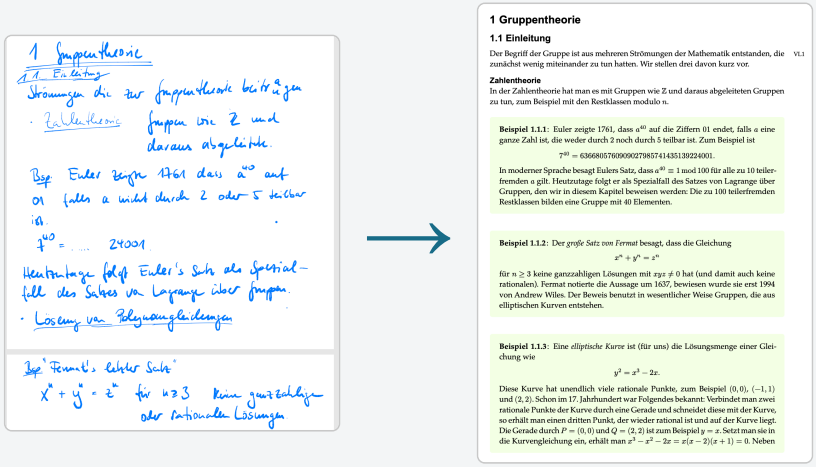


120 pages of lecture notes
with AI: **30 min**

Thinking fast and slow

Doing research changes the researcher. In this talk I will try to document my personal story with AI. I love computers and have been an early adopter of AI with a mostly positive outlook onto the future. Recently the picture has become a lot more grim. This has two reasons. The first is that it is becoming clearer every day how we simply cannot extend the trust that we naturally have between mathematicians also to big tech. The second reason is that I observe changes in myself that I don't like. I used to say that writing is thinking and I still believe it is true. But I also outsourced a lot of writing to the machine, feeding it notes and unfinished thoughts and then editing the result to sound more like me. For certain texts (like bureaucratic letters) this is certainly an efficient and acceptable way to proceed, but for my core thinking I want to learn to accept that this is a slow and messy human process.

Abstract of this talk · **without** AI · **30 min**



120 pages of lecture notes

with AI: **30 min**

without AI: **0 min**

Jevons paradox



W. Stanley Jevons (1835–1882)

"It is wholly a confusion of ideas to suppose that the economical use of fuel is equivalent to a diminished consumption. The very contrary is the truth."

— *The Coal Question*, 1865

Instead of asking what to do now,

ask what *not* to do now.

Instead of asking what to do now,

ask what *not* to do now.

How to choose what *not* to do?

“Short answer: …”

Using Generative AI?

You're PROMPTING *with* HITLER!



GENAI *is a* FASCIST PROJECT!

Try using your **BRAIN INSTEAD**

DON'T SURRENDER YOUR CREATIVITY TO THE TECH BILLIONAIRES' CONTROL


TOUCH GRASS

Godwin's law

$$P(\text{Hitler comparison}) \to 1$$

Mike Godwin, 1990



Thomas Kahle
@tomkalei

If in your job you can say that LLMs have only negative impact, are not really useful, produce slop etc: LUCKY YOU! In my job LLMs do very cool stuff that was exclusively for humans until maybe spring 2026. […] on Mastodon here you will run into proofs of Godwin's law like this here all the time.

It does hurt, believe me.

2 Sep 2026

Not slop. Not theorems.

FINITE TIME BLOWUP FOR NAVIER–STOKES

OPENAI

ABSTRACT. For every positive viscosity, we construct a solution of the three-dimensional incompressible Navier–Stokes equations that starts from rest and develops unbounded velocity in finite time while maintaining uniformly bounded kinetic energy.

Readme

This repository contains mathematical manuscripts and supporting proof artifacts produced by an internal OpenAI model.

As part of model development, we evaluate our models on open research problems. We expanded these evaluations after performance on our existing mathematical evaluations saturated. Some outputs build upon earlier results produced by the models.

This collection includes results at different stages of verification. Not all have accompanying Lean formalizations. We will continue to update this repository with Lean formalizations as we obtain them.

Some of the unformalized results could have issues. We will endeavor to fix any such issues quickly. We are also exploring community-hosted repositories for these materials.

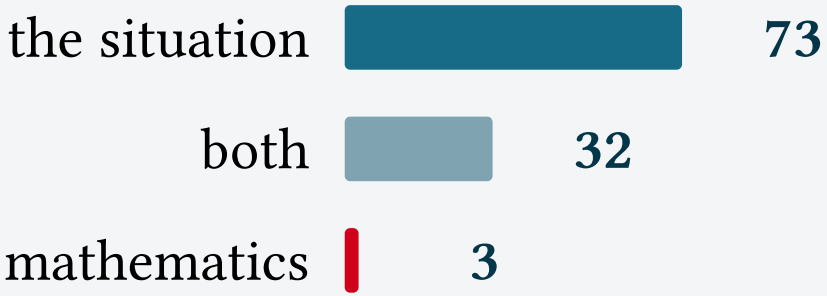
Navigating the collection

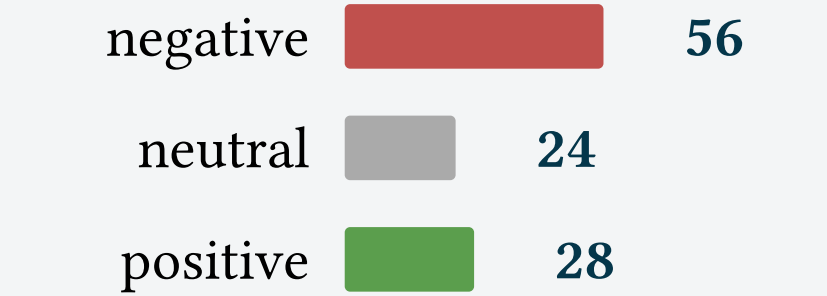
The current catalogue contains 719 manuscripts organized into 372 families. A family groups related papers, which may include a principal result, companion arguments, consequences, or alternative proofs. Each family is classified by mathematical discipline.

- Start with the overview for descriptions of the families.
- Use the manuscript map to find individual papers and their supporting materials.
- The `preprints/` directory contains PDFs, source files, and manuscript-specific citation and build instructions.
- The Lean library and formalization catalogue describe the available formal proofs, their associated papers, and verification configurations. See the Comparator instructions for additional checking instructions. The repository has ~42% top-line results formalized.
- Updates to the repo are described in the history.

Reactions

Sentiment analysis





"100+ reactions to 100+ solutions", Proofs and Prompts

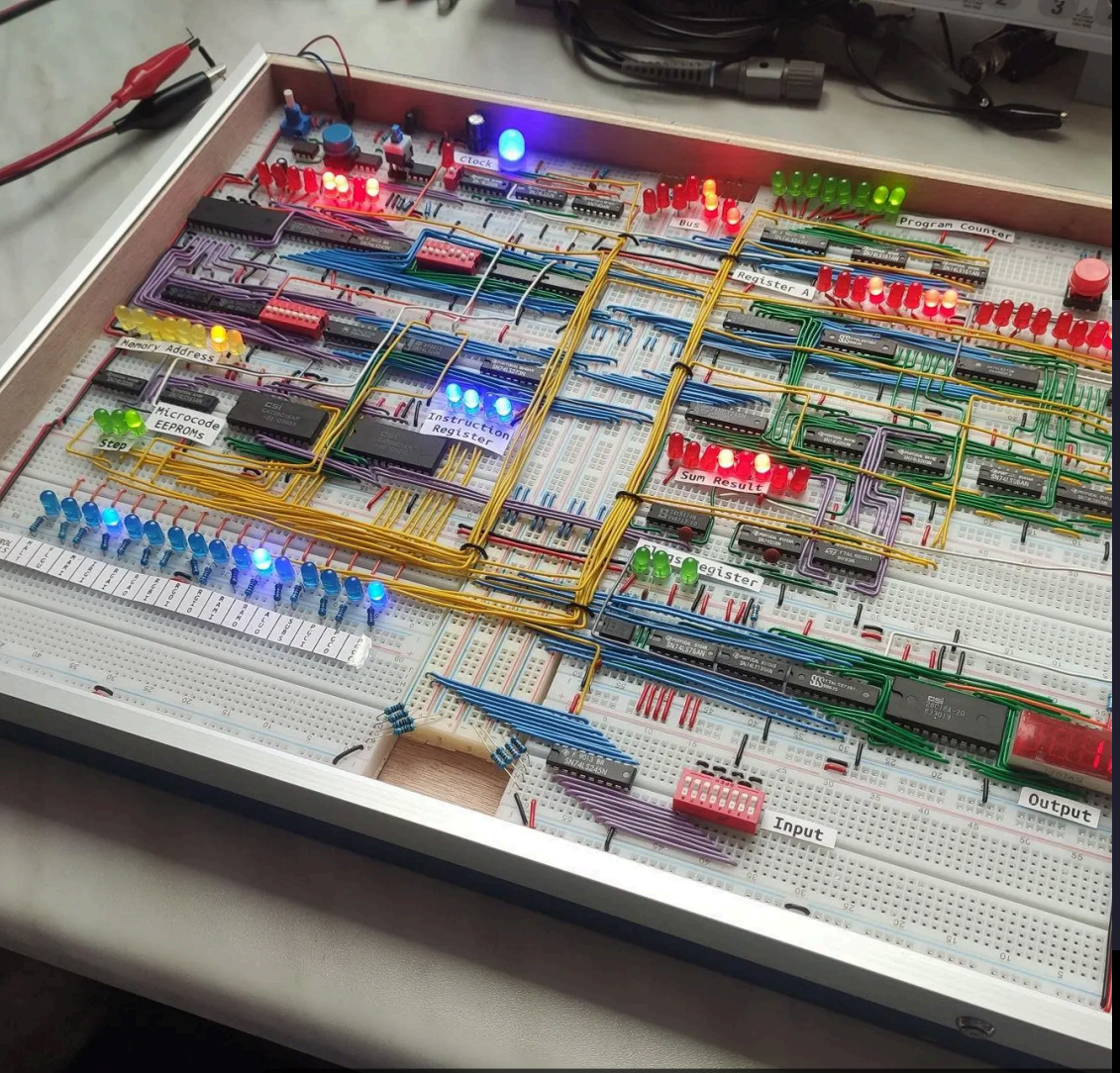
EIG065 Plutimikation

Thomas Kahle
@tomkalei

They put compiled pdfs into the git repo… lame.

7 Oct 2026

“My honest take”



sonification.py — melody + harmony

```python
    # Add notes based on gaps
    for i, note in enumerate(notes):
        # Vary velocity based on note value
        velocity = min(127, 70 + (note % 20))  # Higher notes slightly louder

        # Note on - starts playing the note with specified pitch, velocity (loudness), and timing
        # time=note_spacing ensures consistent rhythmic spacing between consecutive notes
        # This creates the actual sound event in the MIDI sequence
        melody_track.append(Message('note_on', note=note, velocity=velocity, time=note_spacing))

        # Add a harmony note to create a richer sound
        # For each melody note, we add either a perfect fifth (7 semitones) or perfect fourth (5 semitones)
        # The choice between fifth/fourth depends on the note value to add variety
        # Notes below middle C (value % 12 < 6) get a fifth, others get a fourth
        harmony_interval = 7 if note % 12 < 6 else 5  # Perfect fifth or perfect fourth
        harmony_note = note + harmony_interval

        # Only add harmony if it's within MIDI note range (0-127)
        if harmony_note < 127:
            # Add harmony note at slightly lower velocity (-20) for balance
            melody_track.append(Message('note_on', note=harmony_note, velocity=velocity-20, time=0))
            # Turn off harmony note after note_duration
            melody_track.append(Message('note_off', note=harmony_note, velocity=0, time=note_duration))

        # Turn off the main melody note
        melody_track.append(Message('note_off', note=note, velocity=0, time=0))
```

Build the world you want to see.



Do what you love.

(Mathematics)

Aim high.