

# LIS-3353

Everything is a number  
aka “Binary”

aka “I get to bring back this thing that a lot of people hate because cryptocurrency is a thing these days”

Computers don't do “magic”

Not even A.I.

They just take data and mess around  
with it.

e.g our “Magic Genie..

# Remember:

- We're presuming that:
    - - the **local** computer is fast
    - and
      - File storage is costly
    - - the network is slow
- => thus, small filesizes are better.

# File Compression (e.g. ZIP)

- Lossless (or “Perfect”) file compression.

To make smaller, so as to be able to store more, or send faster.

But also, to reproduce PERFECTLY.

(it's not magic)

# Consider:

- *“Penelope and Robert Jones Smith went to the car and grabbed the bat and the ball and the chair and the Doritos and Penelope's coat and Robert Jones Smith's favorite suit and the directions to the park. Penelope told Robert Jones Smith that they and the other people were going to have a wonderful and fun and lovely day. Robert Jones Smith told Penelope that he agreed. Also, that her name started with P.”*

(413)

# First step:

- Turn all the ands into &.

- *Penelope & Robert Jones Smith went to the car & grabbed the bat & the ball & the chair & the Doritos & Penelope's coat & Robert Jones Smith's favorite suit & the directions to the park. Penelope told Robert Jones Smith that they & the other people were going to have a wonderful & fun & lovely day. Robert Jones Smith told Penelope that he agreed. Also, that her name started with P.*

-

&→and

(394)

But this doesn't have to read like English...

*Penelope & Robert Jones Smith went to # car & grabbed # bat & # ball & # chair & # Doritos & Penelope's coat & Robert Jones Smith's favorite suit & # directions to # park. Penelope told Robert Jones Smith that #y & # o#r people were going to have a wonderful & fun & lovely day. Robert Jones Smith told Penelope that he agreed. Also, that her name started with P.*

*&->and*

*#→the*

*(379)*



# Robert has a long name...

*Penelope & RJS went to # car & grabbed # bat & # ball & # chair & # Doritos & Penelope's coat & RJS's favorite suit & # directions to # park. Penelope told RJS that #y & # o#r people were going to have a wonderful & fun & lovely day. RJS told Penelope that he agreed. Also, that her name started with P.*

*&->and*

*#->the*

*RJS->Robert Jones Smith*

*(344)*

# Penelope too, but wait...

- “Also, that her name started with P”

# Penelope too, but wait...

- “Also, that her name started with P”

→

“Also, that her name started with Penelope”

# So, then...

- P & RJS went to # car & grabbed # bat & # ball & # chair & # Doritos & P's coat & RJS's favorite suit & # directions to # park. P told RJS that #y & # o#r people were going to have a wonderful & fun & lovely day. RJS told P that he agreed. Also, that her name started with PP.  
&->and
- #->the
- RJS->Robert Jones Smith
- P→Penelope \ PP→P

(337)



# But what if the next file is?

“My favorite letter? PP

PP all day

Man I love # PP

PP & PP & PP

Gonna say it a bunch

PP PP PP PP PP PP PP PP PP PP PP PP PP PP PP

PP PP PP PP PP”

(140)

# Again, there is no magic

There is NO LOSSLESS compression that makes EVERY example smaller;

All lossless compression has at least one “file” that will get BIGGER.

# Pictures on the web:

- Basically, two formats:

Raster and Vector.

Most of the time you're looking at RASTER, which is basically a grid\*

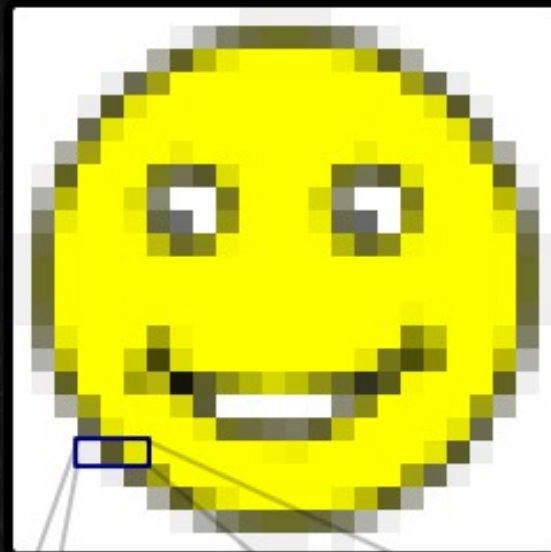
\*kinda



# Pictures on the web:



# Lossless (RAW) Raster



R 93%	R 35%	R 90%
G 93%	G 35%	G 90%
B 93%	B 16%	B 0%

# But this math ain't mathin

$1920 \times 1080 = 2 \text{ million}$

$2 \text{ million} \times 8 \text{ colors} = 2 \text{ MB (megabytes) ?}$

$3480 \times 2160 = 8 \text{ million}$

only 8 colors would be 8 megabytes

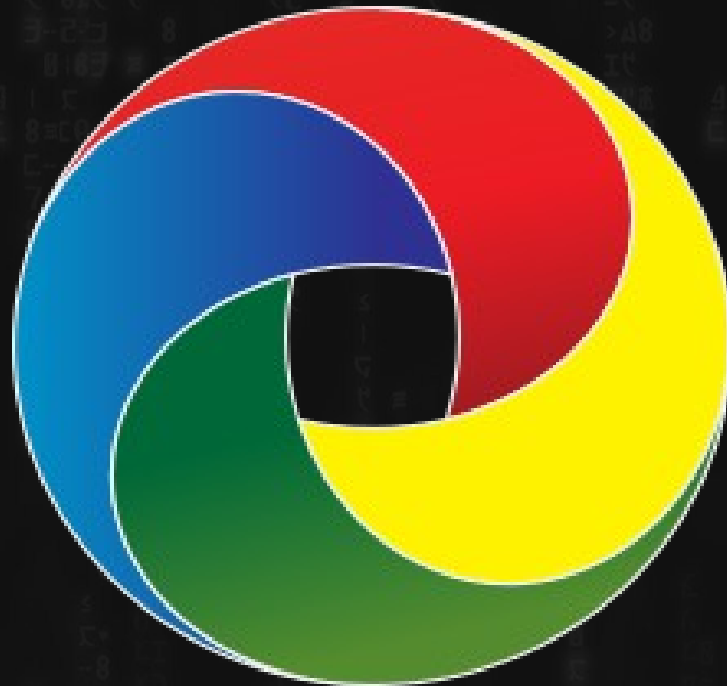
but we don't use 8 colors

WE USE 16 MILLION?

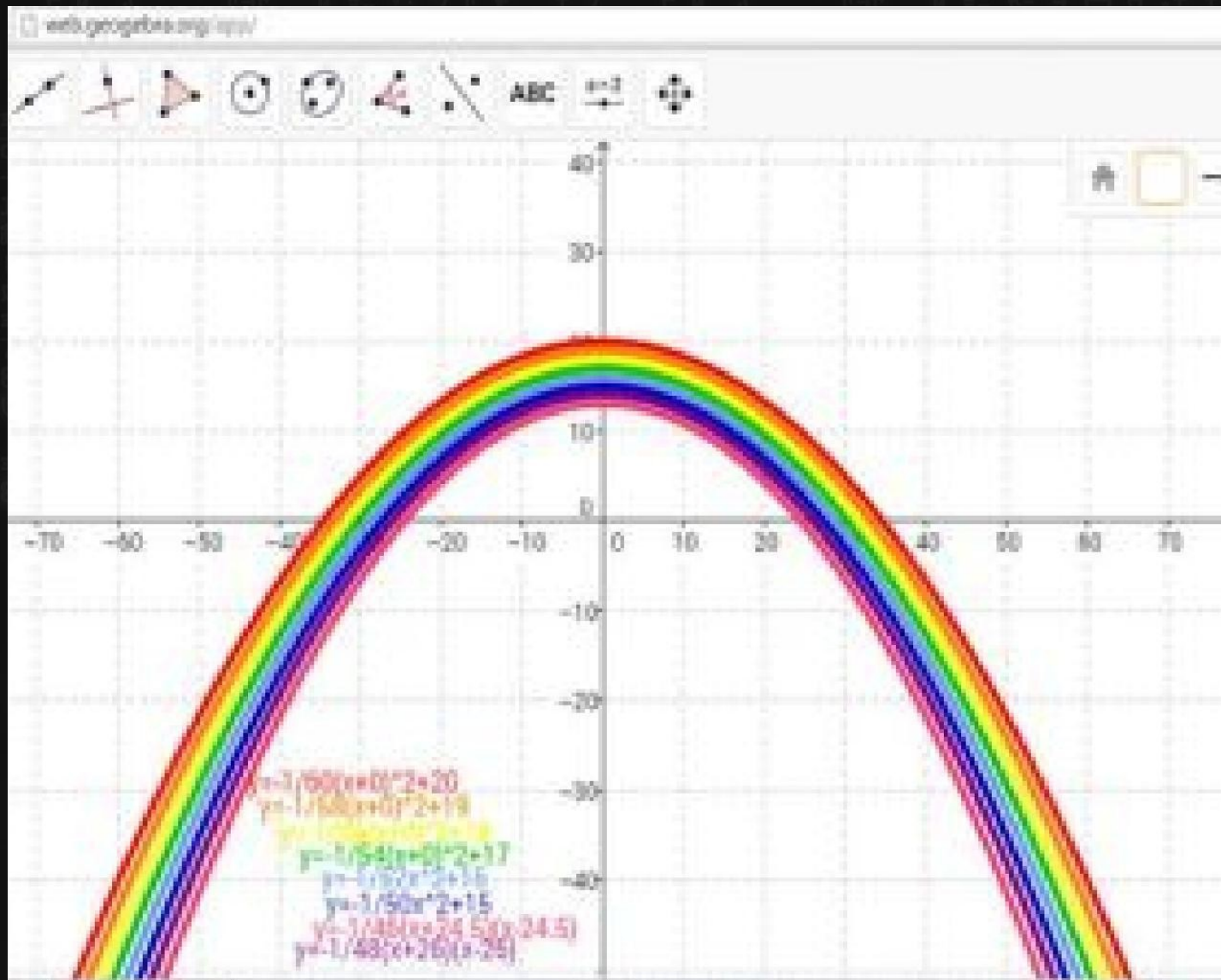
#ABCDEF

# Vector Graphics

- Use math (specifically, geometry) to tell the computer how to draw the lines and do the colors – then render it somehow



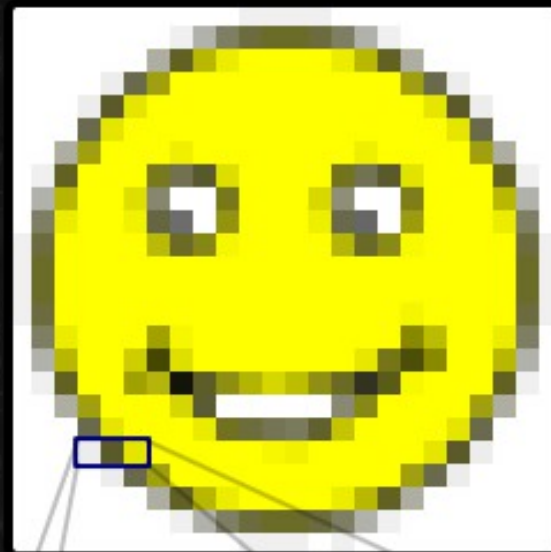
# Pictures on the web:



# Pictures on the web:



# Lossless (RAW) Raster



R 93%	R 35%	R 90%
G 93%	G 35%	G 90%
B 93%	B 16%	B 0%

# Lossless image compression

- Instead of  
“0,0 = white    0,5 = white
- 0,1 = white    0,6 = white
- 0,2 = white    0,7 = white
- 0,3 = white    0,8 = white
- 0,4 = white    0,9 = white” ...



Just say..

- 
- 0,0 through 0, 10 = white.

# This also works for audio...

- 1 sec. = silence
- 2 sec. = silence
- 3 sec. = silence....etc

just say

1-10 sec. = silence

..and video

“at 0,0 for 10 seconds = white”

# But without getting into detail

- This math still ain't mathin

Let's take advantage of the fact that we are analogue:

# Lossy Compression

EVEN better, for us humans.

We can't see or hear tiny differences, so this is very good for e.g. pictures/video/sound.

# Lossy compression = Good for analogue/multimedia

Tiny filesizes; takes advantage of the limitations in human perception.

We cannot perceive individual pixels (or samples) when surrounded by other meaningful pixels/samples. They blur, frequently in predictable patterns.

# “Goldilocks and the 3 bears” (with lossy compression)

- 
- 
- Some nosey girl went up in some bears' house, ate their food, fell asleep and freaked out when the bears came back.

- “if 0,0 is white, 0,1 is likely to be white, or light gray”

“if 0,1 is light gray, 0,2 is likely to be slightly darker gray...”

Okay, so just  $(x + 1)$  the darkness every pixel to the left.

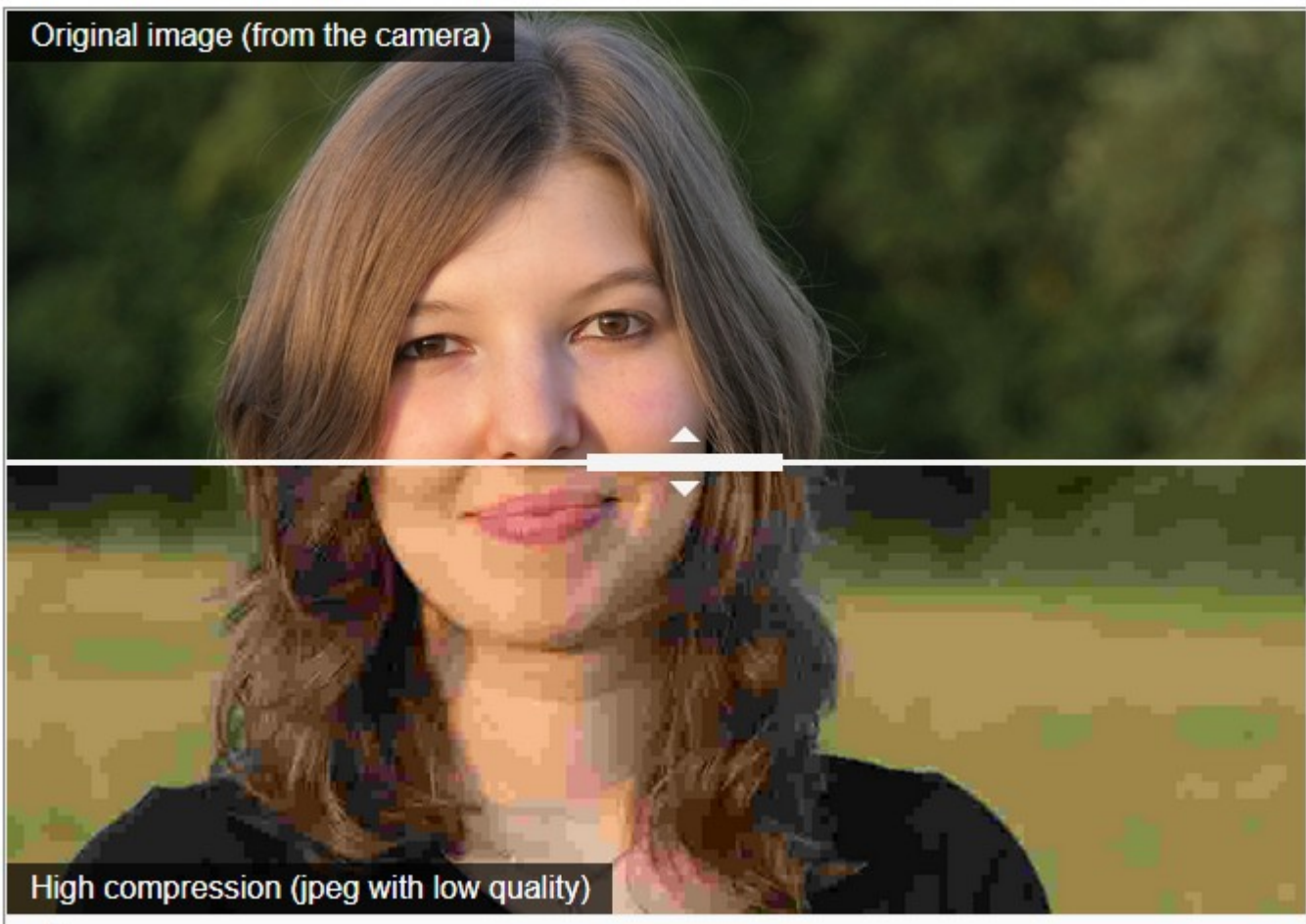
$$y=x+1$$



- What happens if you compress something losslessly over and over?

What happens if you compress something lossily over and over?

- ?



Can also “fix” images  
”denoising”



# Smart people terms

How to store knowledge:

I'm going to put the number PI on the next slide.

the whole thing

Seriously

# Smart people terms

”The ratio of a circle’s circumference to its diameter”

BOOM.

# Kolmogorov Complexity

Basically “what do you need to completely describe the thing.”

Stored as a numeral,  $\pi$ , is infinitely ‘complex’

But it’s not “Kolmogorov Complex” at all.

# Lets try something

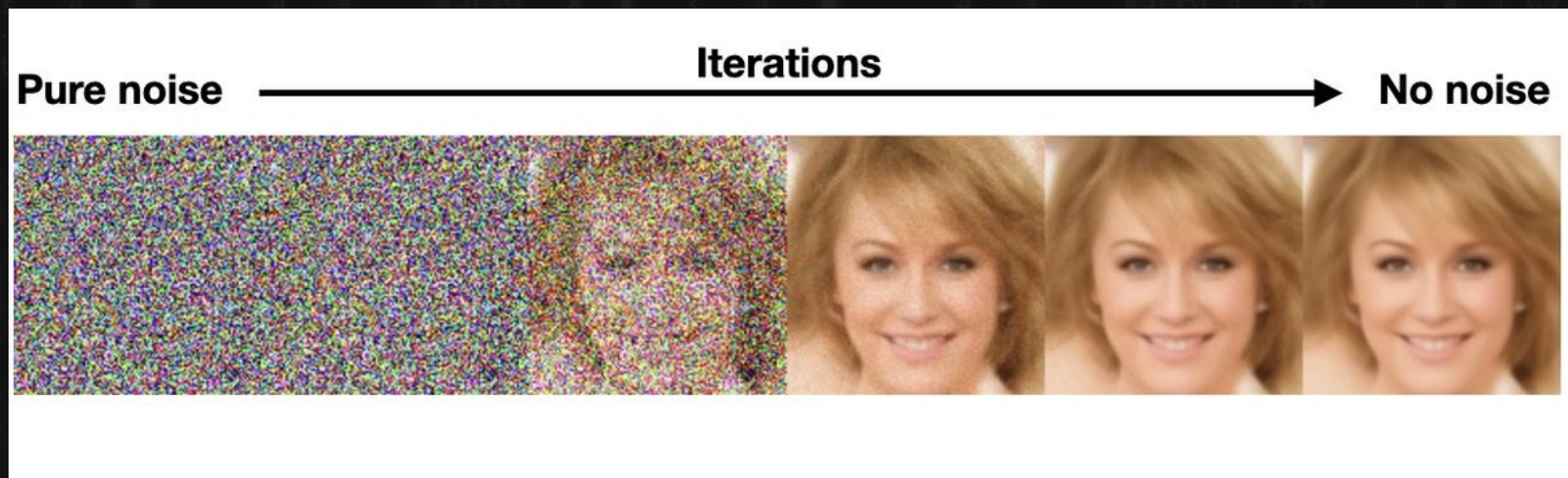
1. Get every image on the internet that has words.
2. Deliberately add noise to them and tell the computer to watch for math patterns



# Now do that backwards

3. Take words, e.g. “womans face,”  
then “denoise” according to what you learned by  
mathematically analyzing

(this is AI art)





Okay, AI

First, lets try words.

This is actually not hard...

You could literally just do random words..but that's not great...

Fill in the blank.

Seven \_\_\_\_\_?

Fill in the blank.

Seven \_\_\_\_\_?

Seas?  
Continents?  
Nation Army?

Sure, pick one, sometimes randomly.

Fill in the blank.

Four Score and Seven \_\_\_\_\_?

Again, not hard.

The computer just picks the one (or one of the ones) that usually follows  
**FROM THE DATA IT SEES.**

By the way

Remember “the” and & et al from  
before?

The text AI’s mostly don’t use words,  
but “tokens”



Not too different from our  
magic genie

Just a series of choices/options.

# AI

Lots of moved goalposts

- chess

- basic questions

**TURING COMPLETENESS**

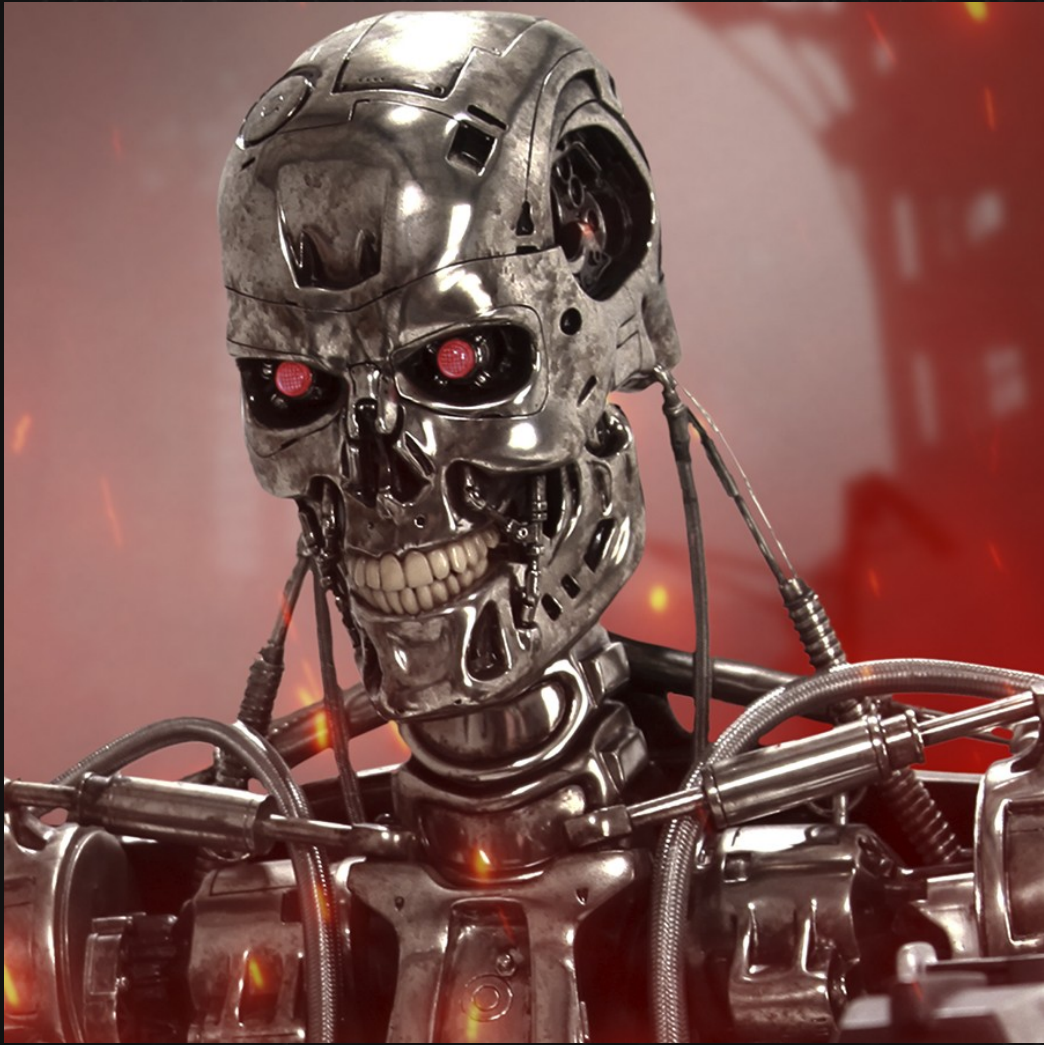
# Big Picture Ideas

Some have moved from “AI”  
to  
“AGI”  
“Artificial General Intelligence”

# Big Picture Ideas

## ”The Singularity”

The point at which AI intelligence surpasses ours, and therefore there’s literally no point in trying to think about after that...





Literally just my opinion, but: meh.

After YEARS of doing  
“todo/ideas/2nd brain stuff”

I've landed on some conclusions:

We can think; the computers can just  
“play back” what we’ve done.

That’s ALL.



# Habits MOC

links: [Mindsets](#), [Walking through the 3 phases of MOCs](#)

## Habits MOC - Unifying Phase

*Enjoy and Use* - Enjoy the spatial constellation you created. It's certainly meaningful to you. Use it for different purposes: for final products (content creation), as a reference point in the future, or for the inherent joy the ideas provide.

Here's an assembly of the notes in some sort of formalized structure. I have continued adding to this whenever it made sense.

### Understanding Habits

- [Defining a habit](#)
- [Habit formation provides an evolutionary advantage](#)
- [Habits carry a ton of hidden inertia](#)
- [The neural formation of habits is additive](#)
  - [The truest habit metaphors are additive](#)

### Designing Habits

- [Understanding the habit cycle and habitual cues](#)
  - [How Atomic Habits fit into the conversation on habits](#)
  - [Resiliency Routines help regain a sense of control](#)
  - [Improving Micro Habits at the Point of Contact](#)
- [Small Wins foster a Sense of Control](#)
- [An asymptotic curve models the development of skills, strength, habits, and more](#)
  - [The mechanism for breaking through development plateaus](#)

### Example of Habit Design

- [Charting out habit cycles in my life circa 2013](#)

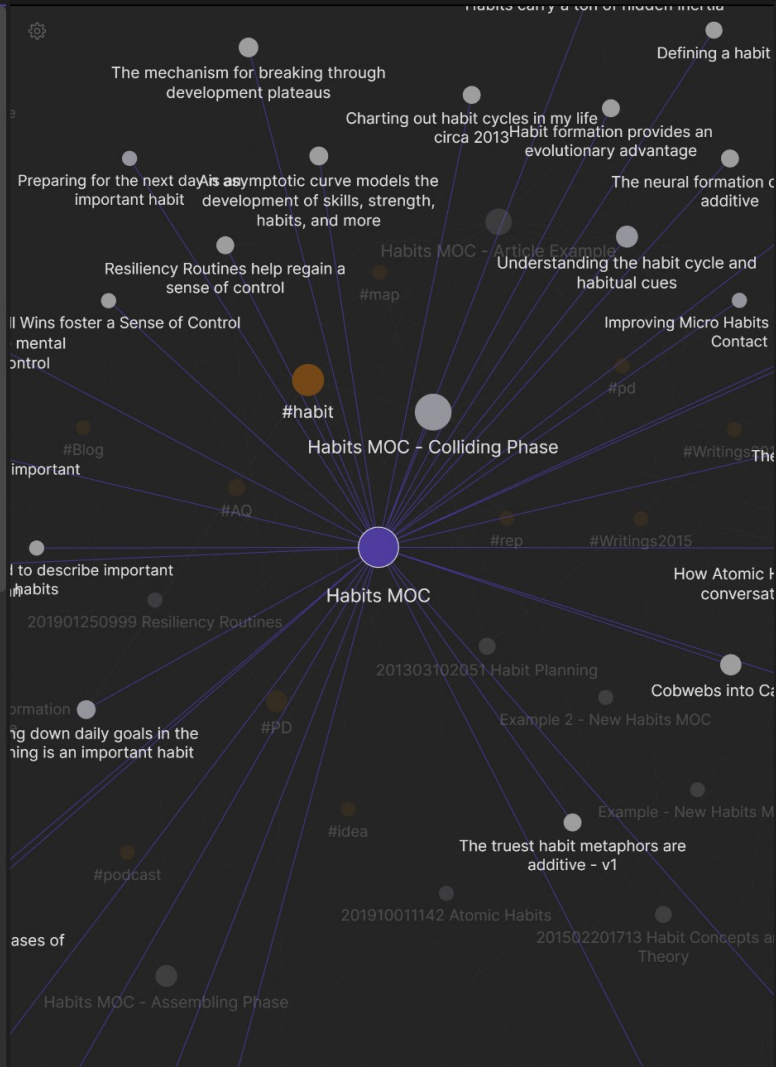
### Important Habits

[Important habits preserve mental clarity and a sense of control](#)  
[Preparing for the next day is an important habit](#)  
[Journaling in the morning is an important habit](#)  
[Writing down daily goals in the morning is an important habit](#)

### Related Concepts

[Positive Feedback Loop](#), [Like begets like](#)  
[Cobwebs into Cables](#), [Reps](#), [Sense of Control](#)

## Graph view



- Habits MOC - Unifying Phase
  - Understanding Habits
    - Designing Habits
      - Example of Habit Design
        - Important Habits
          - Related Concepts
            - Other
- Linked mentions 19
  - 010 Mindsets MOC 1
    - [[Habits MOC]]
  - 030 Interests MOC 1
    - ...dsets MOC]] | [[020 Concepts MOC|Concepts MOC]] | [[Habits MOC|Habits MOC]] |
  - Being able to adapt is an important habit 1
    - links: [[Habits MOC]]
  - Cobwebs into Cables 1
    - links: [[020 Concepts MOC|Concepts MOC]], [[Habits MOC]], [[LYT System]]
  - Habits MOC - Colliding Phase 1
    - Next: [[Habits MOC]]
  - Important habits preserve mental clarity and a sense of control 1
    - links: [[Habits MOC]]
  - Improving Micro Habits at the 1

LYT Kit

- Resources
- Sources
- Timestamps
- Workspaces
- \_START HERE
- 000 Home
- 010 Mindsets MOC
- 020 Concepts MOC
- 030 Interests MOC
- 040 Writings MOC
- 050 Sources MOC
- 060 People MOC
- 070 Health MOC
- 080 Goals MOC
- 085 Compass MOC
- 090 PKM MOC
- 095 Lists MOC
- 100 Projects MOC
- 2020-06-02 O- On the proo
- 2020-08-08 O- In what way
- Allide

#

- #PKM 47
- #concept 32
- #habit 31
- #MOC 25
- #PD 14
- #source 13
- #quote 11
- #develop 9
- #AQ 8
- #output 8
- #fave 7

Looks cool. Appealing.

but IMHO, our brains are WAY better  
at this part. Kinda pointless.

The computers ARE good at “repeating  
verbatim,” tho