EYAL GRUSS

Talpiyot graduate
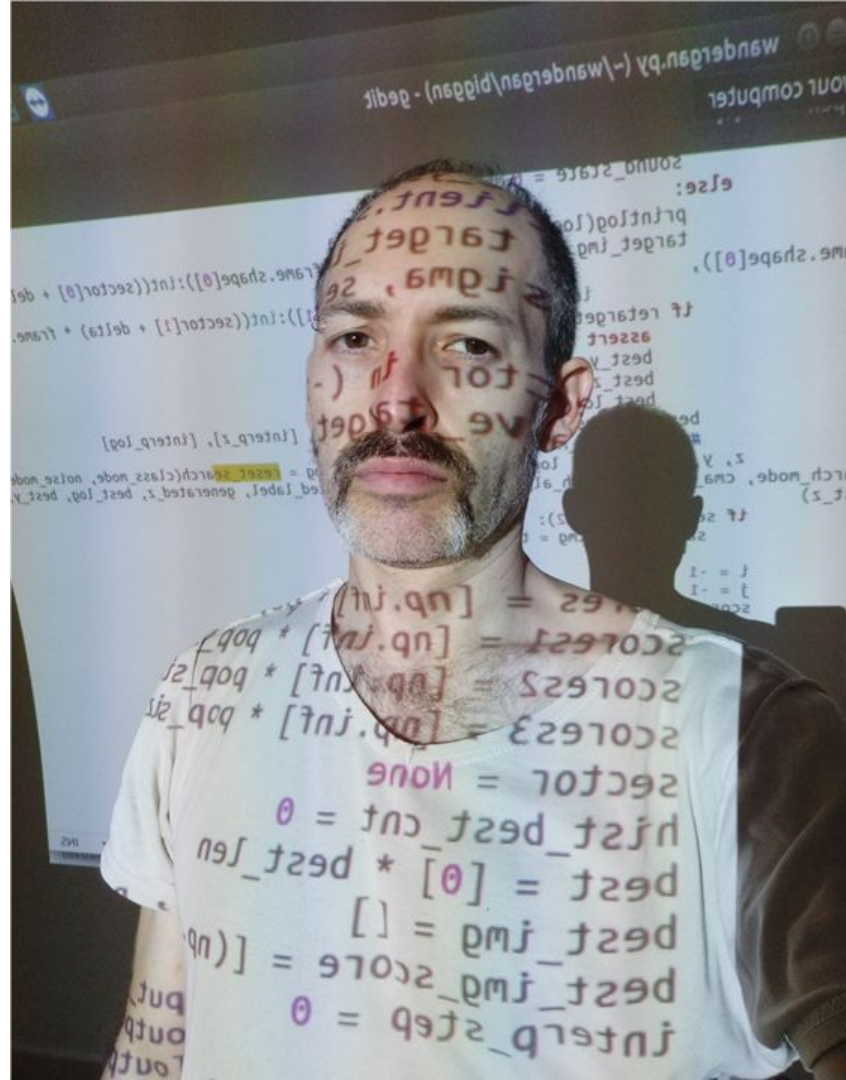
Physics PhD

Code/Media/Text Artist

Machine learning researcher

Teaching computational creativity

eyalgruss.com

COMPRESSION IS INTERESTING

Friend: Can you help compress a 750 MB

12-hour white noise audio file?

Me: No! This is theoretically impossible,

and… Yes! This is just one line of code

COMPRESSION IS INTERESTING

Friend: Can you put 1000 haikus in

a stand-alone 25 kB HTML?

Me: Yes! Here are the next 6 months of my life

RS: Can you compress that to a 5 minute talk?

1000 HAIKUS IN A 25 kB HTML?

I walk in the streets\n

Feel a cold northern breeze play\n
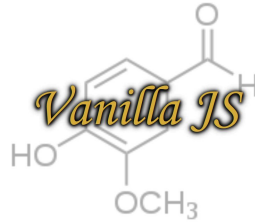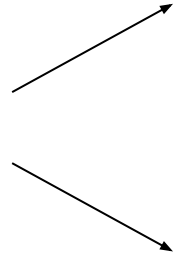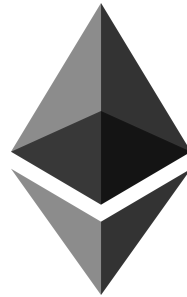
Fills me with delight\n\n

↓

1000 × **77 B** = 75 kB

1000 HAIKUS IN A 25 kB HTML?

Art Blocks

Vanilla JS

Everything in 1 stand-alone JS

On-chain storage
1 kB ~ 100 USD

TEXT DOMAIN

\r\n → \n

I → i

the → __

qu → q

ENTROPY CODING

```
_   →   000

e   →   001

c   →   111000

z   →   1111111111
```
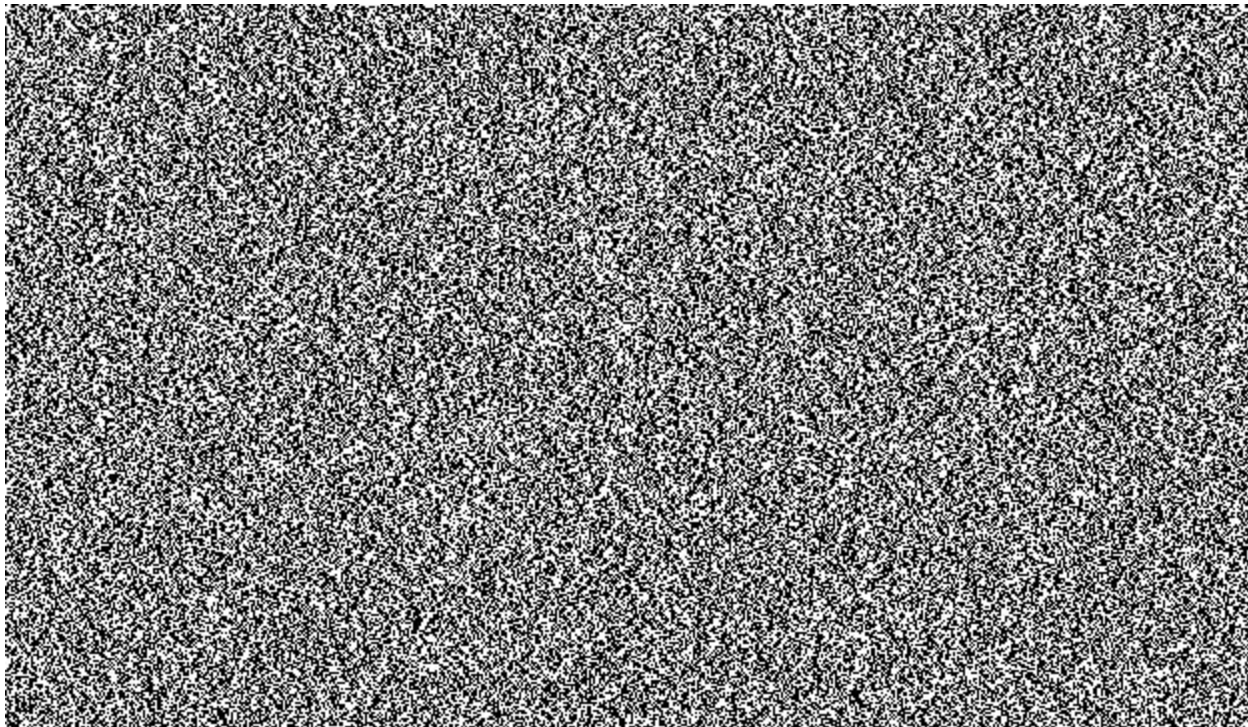
PNG BOOTSTRAP

Yup, 1000 haikus

GLOBAL TRANSFORMATIONS
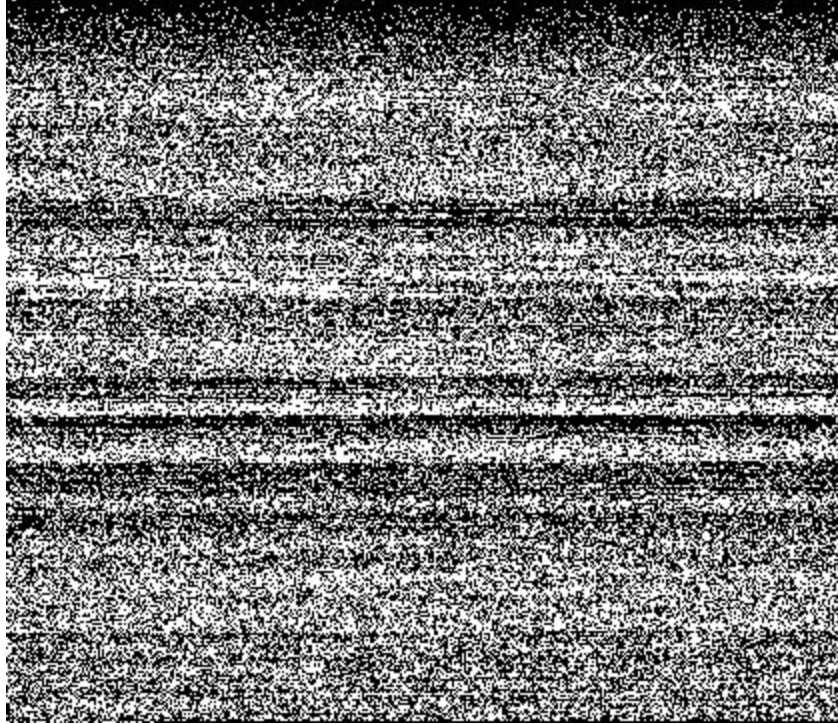
Same

1000

haikus

much more

compressible

~~SEPARATION~~ UNION OF CONCERNS

#1
The work of your hands
I exclaimed in agony
Lizzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzye the archangel

#2
Lizzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzye the archangel
You expect to be informed
The lamb zzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzxrmb kid

#3
The lamb zzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzxrmb kid
Agitation as I said
I often refused

#4
I often refused
To zzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzsonfide in my prudence
A condition more

BINARY TO TEXT

Base64

`<img src="data:image/png;base64,iVBORw0KGgoAAAANSU`

`hEUgAAAAUAAAAFCAYAAACNbyblAAAAHElEQVQI12P4//8/w38G`

`IAXDIBKE0DHxgljNBAAO9TXL0Y4OHwAAAABJRU5ErkJggg==">`

33.3% overhead

BINARY TO TEXT

Base128-ish

14.7% overhead

BINARY TO TEXT

yEncode?

```
NUL SOH STX ETX EOT ENQ ACK BEL BS HT LF VT FF CR SO SI DLE DC1 DC2 DC3 DC4 NAK SYN ETB CAN EM SUB ESC FS GS RS US
 !"#$%&'()*+,-./0123456789:;<=>?
@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
`abcdefghijklmnopqrstuvwxyz{|}~ DEL
€ · ‚ƒ„…†‡ˆ‰Š‹Œ · Ž · · ''""•——˜™š›œ · žŸ
 ¡¢£¤¥¦§¨©ª«¬-®¯°±²³´µ¶· ¸ ¹º»¼½¾¿
ÀÁÂÃÄÅÆÇÈÉÊËÌÍÎÏÐÑÒÓÔÕÖ×ØÙÚÛÜÝÞß
àáâãäåæçèéêëìíîïðñòóôõö÷øùúûüýþÿ
```

Only encode **CR**

~~UTF-8~~

CP-1252

1.2% overhead

BENCHMARK

	Micromegas (En)	War and Peace (En)
Project Gutenberg .txt	63.7 kB	3.2 MB
7-Zip (max settings)	20.8 kB (32%)	746 kB (23%)
7-Zip (self-extract)	232 kB (364%)	958 kB (29%)
ZTML Base125 (UTF-8)	26.4 kB (41%)	902 kB (28%)
ZTML crEnc (CP-1252)	23.5 kB (37%)	803 kB (24%)

NOT ONLY TEXT

- Efficient inline image encoding (~~Base64~~)

- Eternal websites on the blockchain

e.g. WEBZOS wbtz.github.io

COMPRESSION IS INTERESTING

Generative Art

Kolmogorov Complexity

Code Golf

Demoscene

Web3

ZTML - EXTREME INLINE TEXT COMPRESSION FOR HTML/JS

github.com/eyaler/ztml

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