

Intro to AI & AI DAOs: Nature 2.0 Edition

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Ocean | BigchainDB

Trucking
3.5M jobs ☁



Retail
4.6M jobs ☁



Creative jobs?



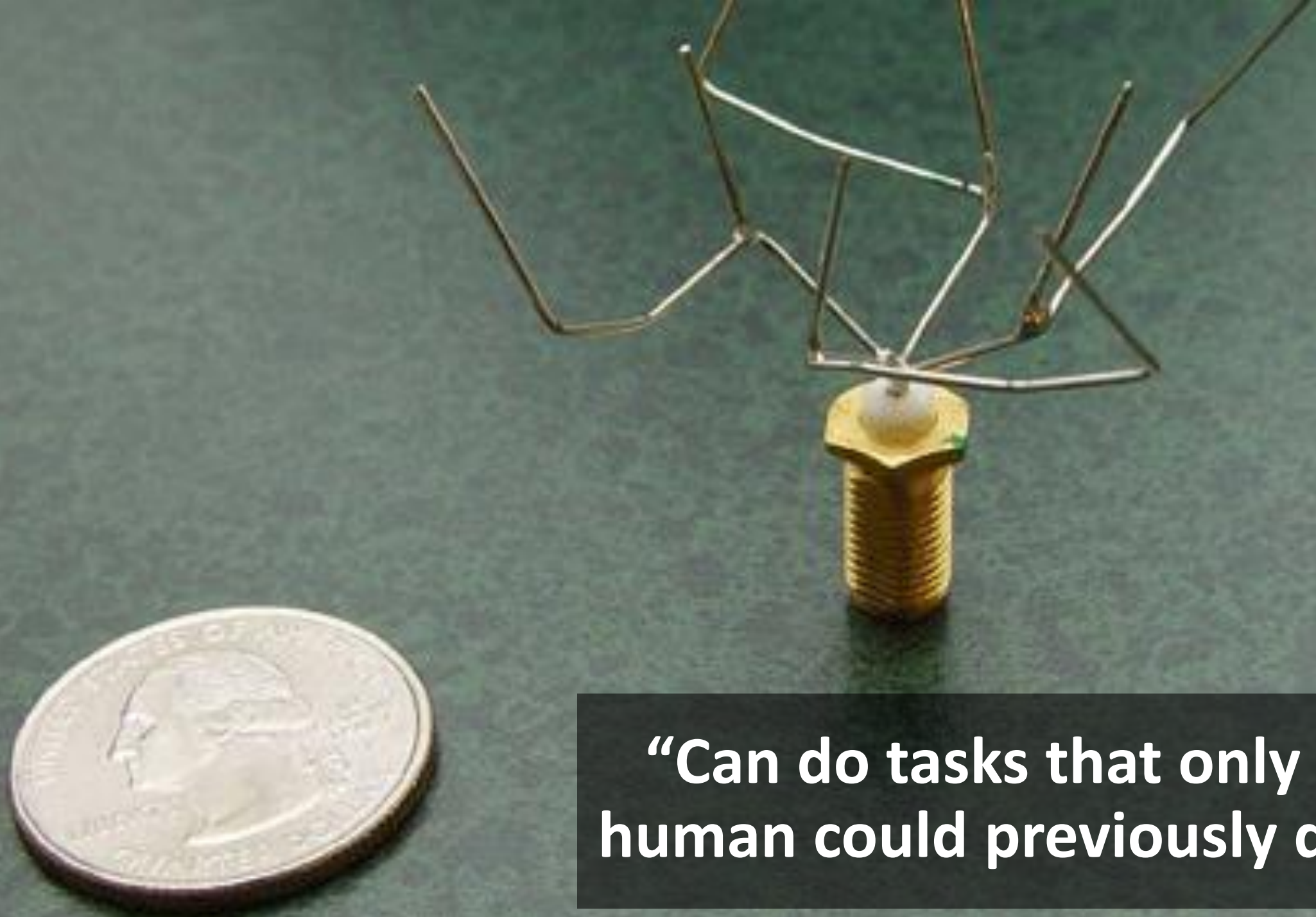
**In an age of AI,
How to feed our families?
Achieve abundance?**



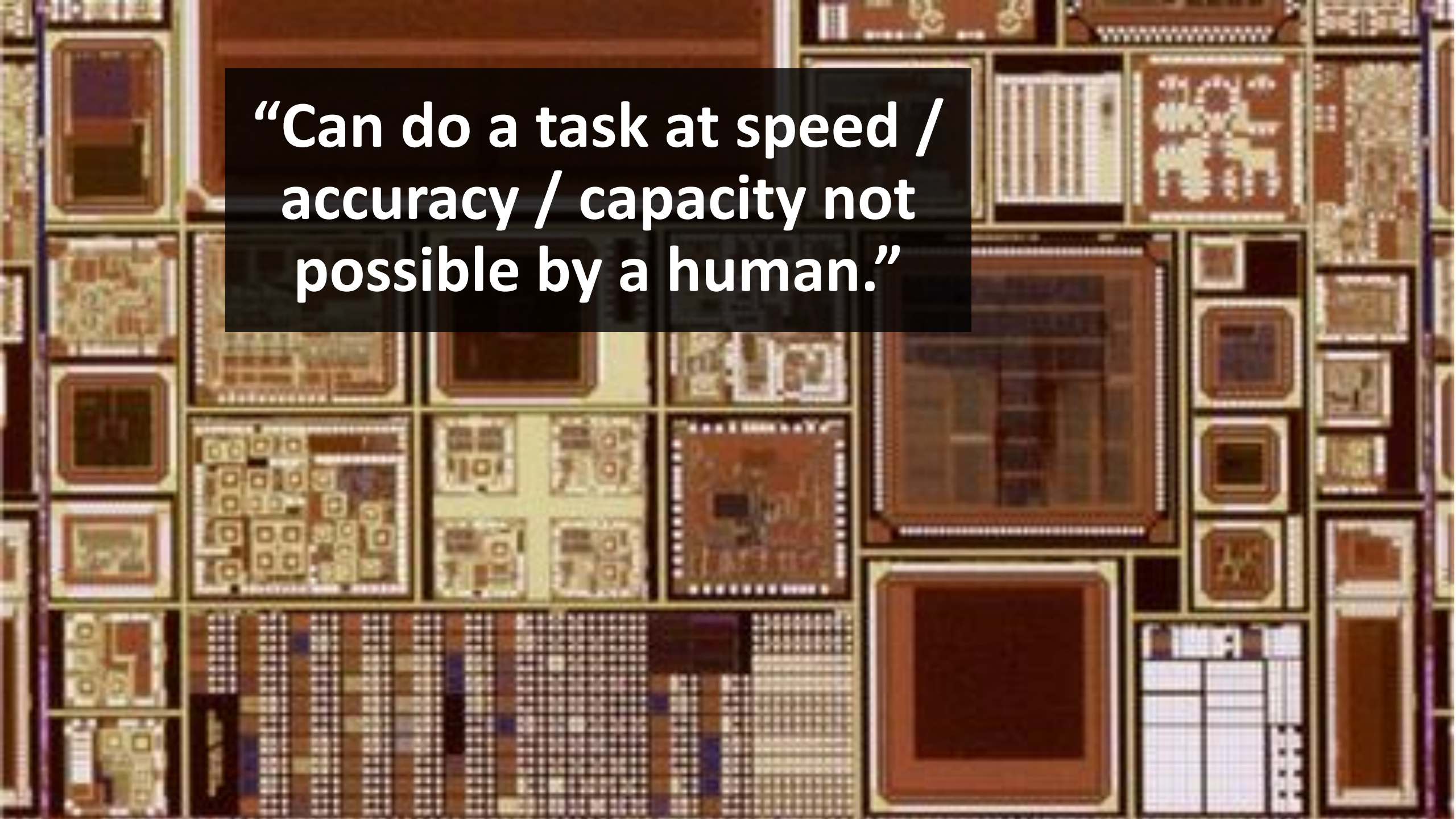
Ways to frame AI

“Replicates human cognitive behavior” [Turing test]





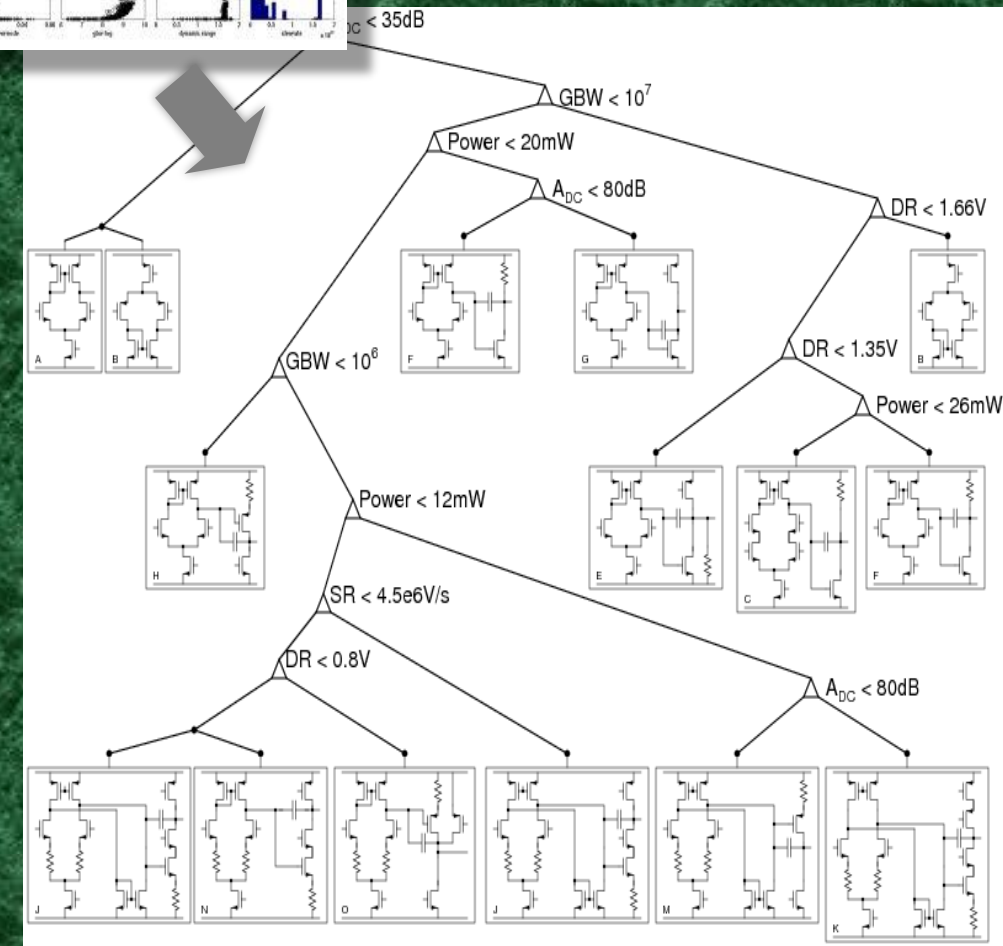
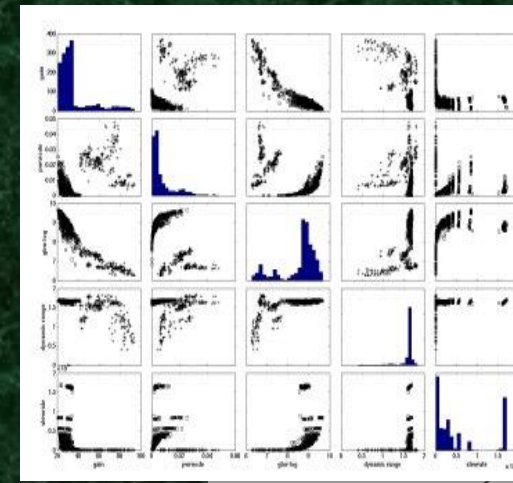
“Can do tasks that only a human could previously do”

An aerial photograph of a city grid, likely New York City, showing a dense pattern of streets and buildings. The image is slightly blurred, giving it a vintage or artistic feel. A large, dark, semi-transparent rectangular box is centered over the image, containing white text. The text is a quote about the capabilities of a task compared to human capacity.

**“Can do a task at speed /
accuracy / capacity not
possible by a human.”**

“A set of tools”

- Classification
- Regression
- Knowledge extraction
- Optimization
- Creative / Structural design
- ...





“Embodied agents” (AGI)

AI Tools: Deep Dive

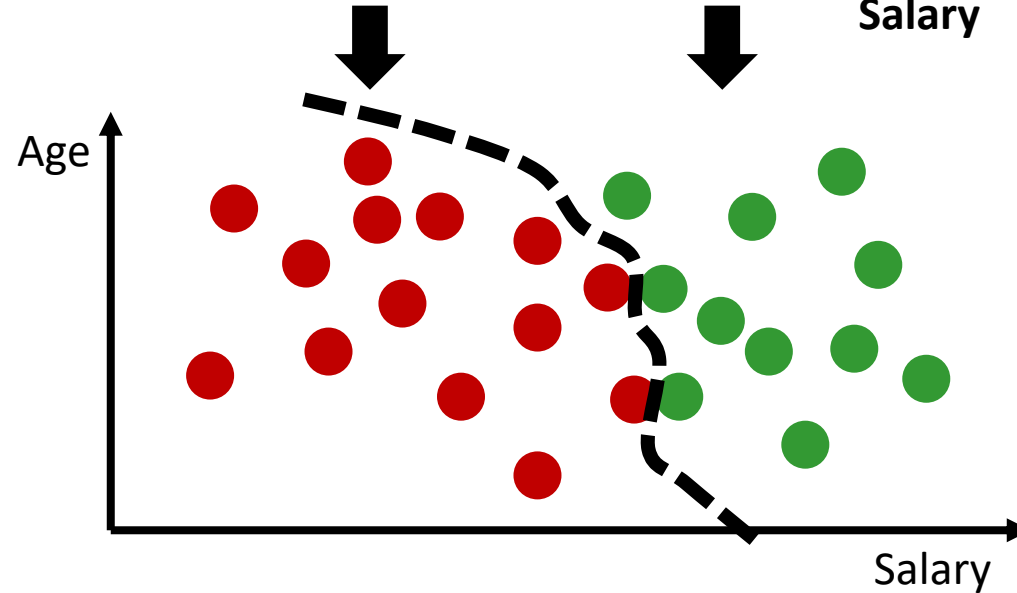
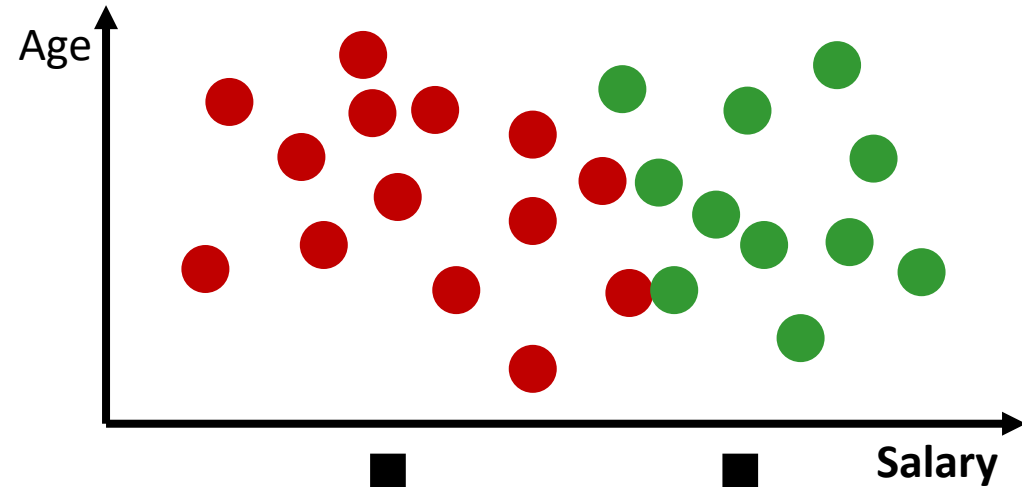
Classification, in 2D

Use case: credit card applications

Credit profile:

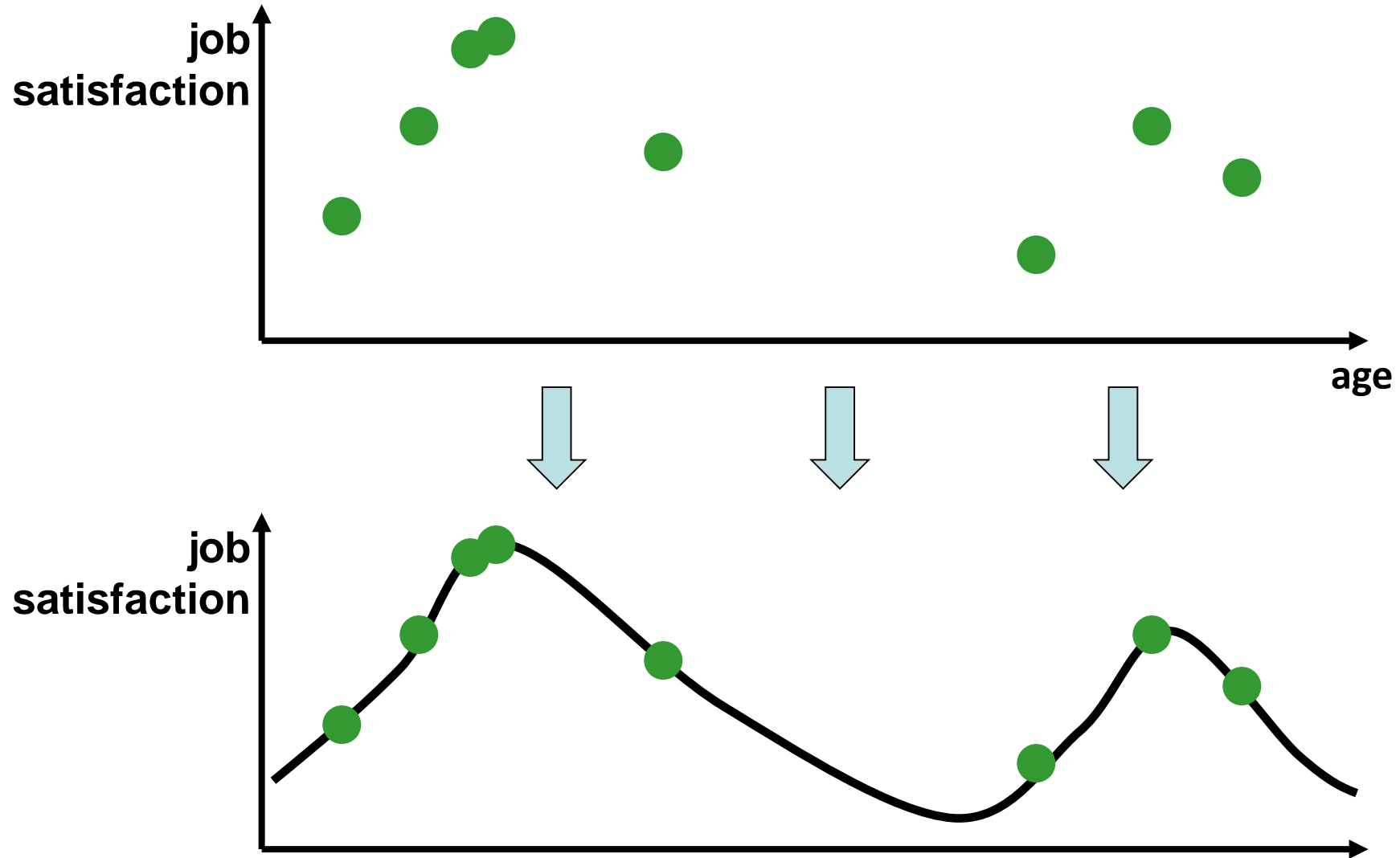
● Paid bills

● Didn't pay

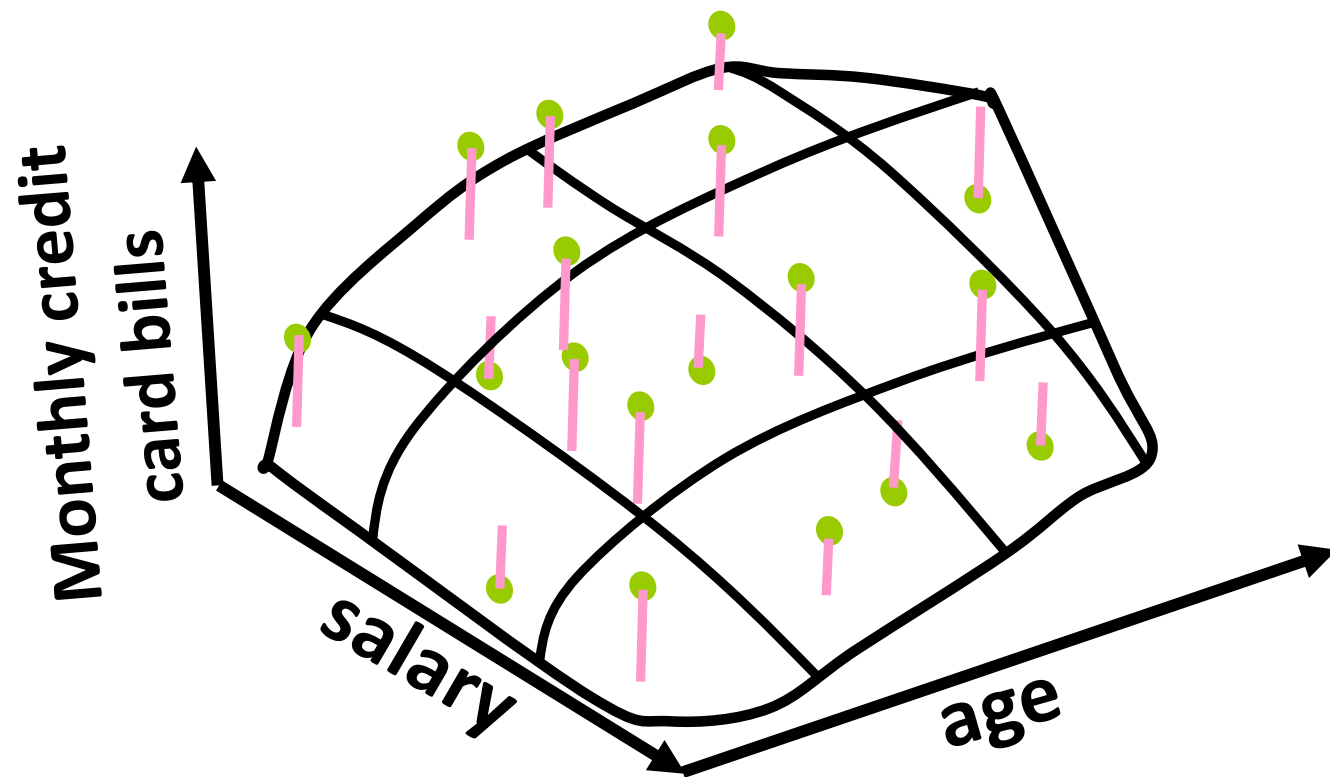


How: linear classifiers, neural networks / deep learning, support vector machines, boosted trees, random forests / bagged trees

Regression, in 1D



Regression, in 2D



Regression in 10,000D

Use case: reverse image search [Google]

Videos

News

More

Sort by relevance

Sort by subject

Any size

Large

Medium

Icon

Larger than...

Exactly...

Any color

Full color

Black and white



Any type

Face

Photo

Clip art

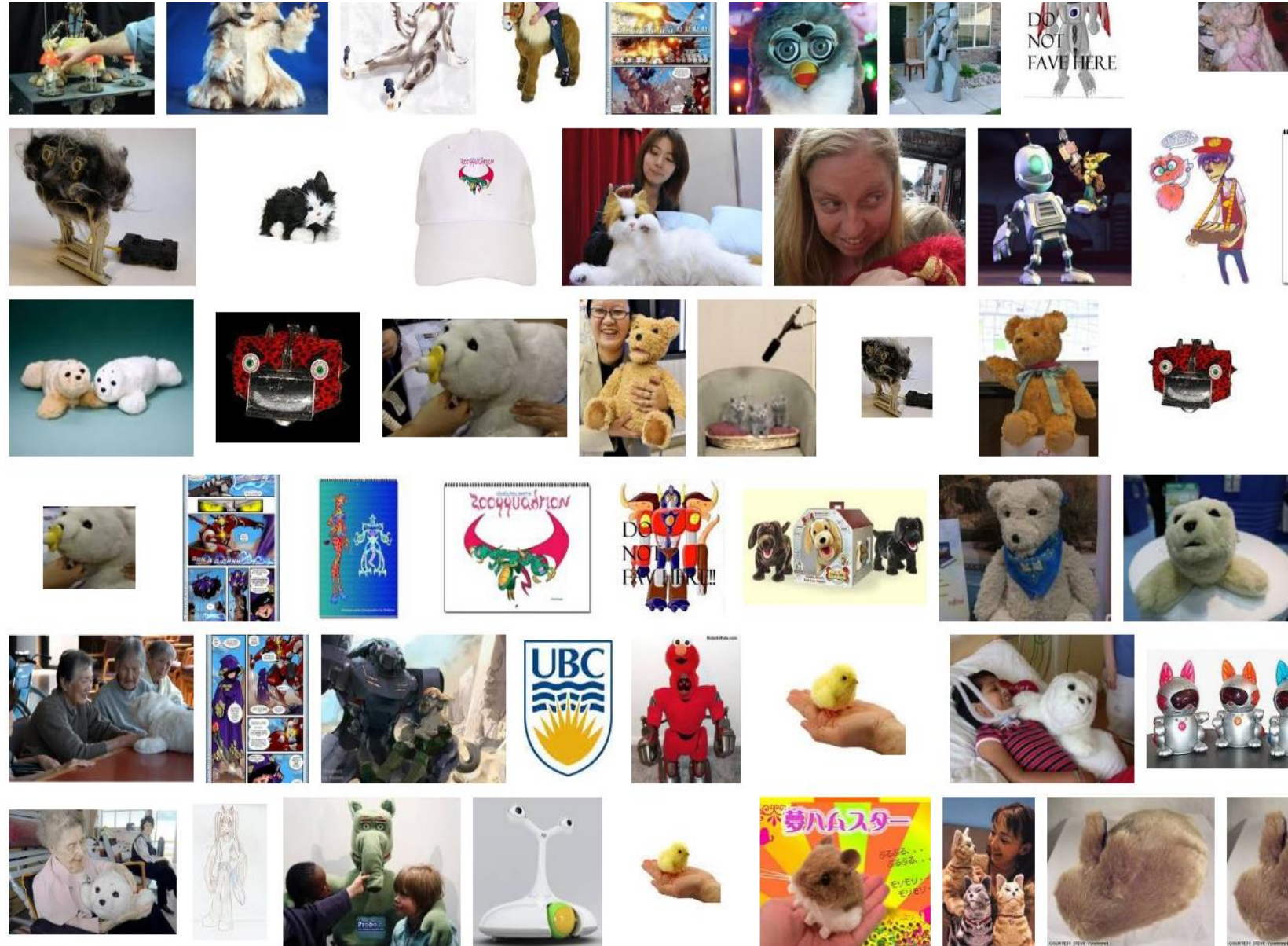
Line drawing

Standard view

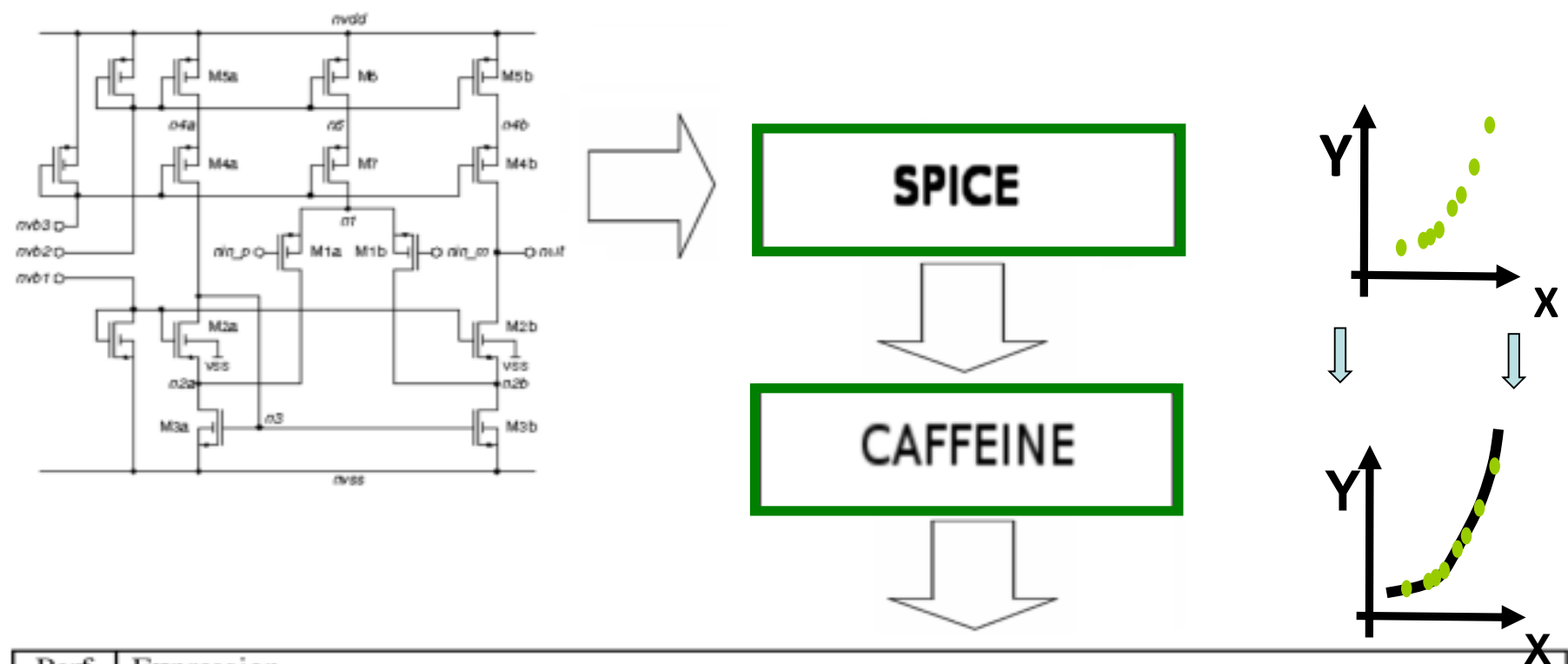
Show sizes

Any time

Past week



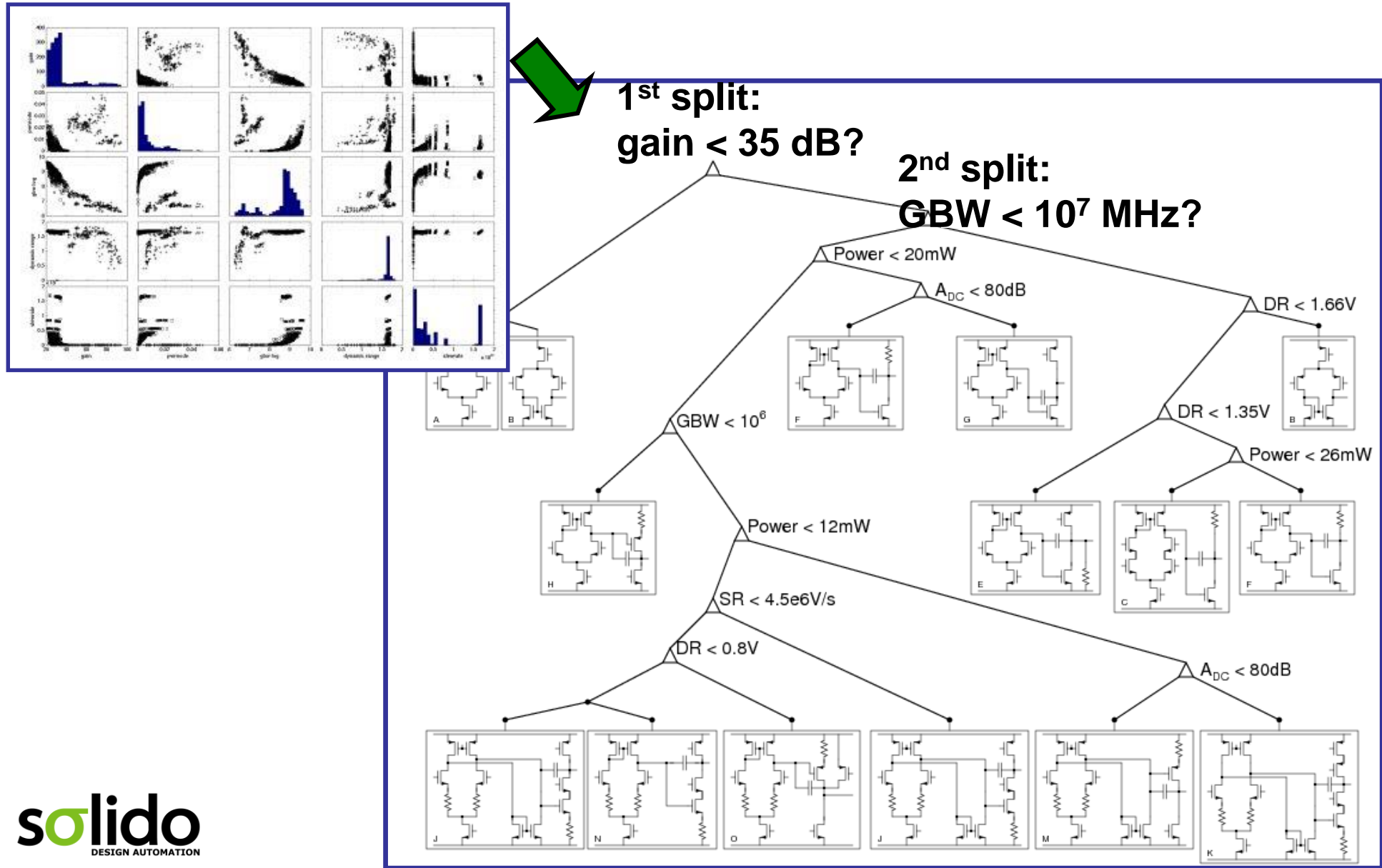
Use case: scientific modeling of analog ccts [McC '05 KUL]



Perf.	Expression
A_{LF}	$-10.3 + 7.08e-5 / id1 + 1.87 * \ln(-1.95e+9 + 1.00e+10 / (vsg1*vsg3)+ 1.42e+9 *(vds2*vds5) / (vsg1*vgs2*vsg5*id2))$
f_u	$10^{(5.68 - 0.03 * vsg1 / vds2 - 55.43 * id1+ 5.63e-6 / id1)}$
PM	$90.5 + 190.6 * id1 / vsg1 + 22.2 * id2 / vds2$
V_{offset}	$- 2.00e-3$
SR_p	$2.36e+7 + 1.95e+4 * id2 / id1 - 104.69 / id2 + 2.15e+9 * id2 + 4.63e+8 * id1$
SR_n	$- 5.72e+7 - 2.50e+11 * (id1*id2) / vgs2 + 5.53e+6 * vds2 / vgs2 + 109.72 / id1$

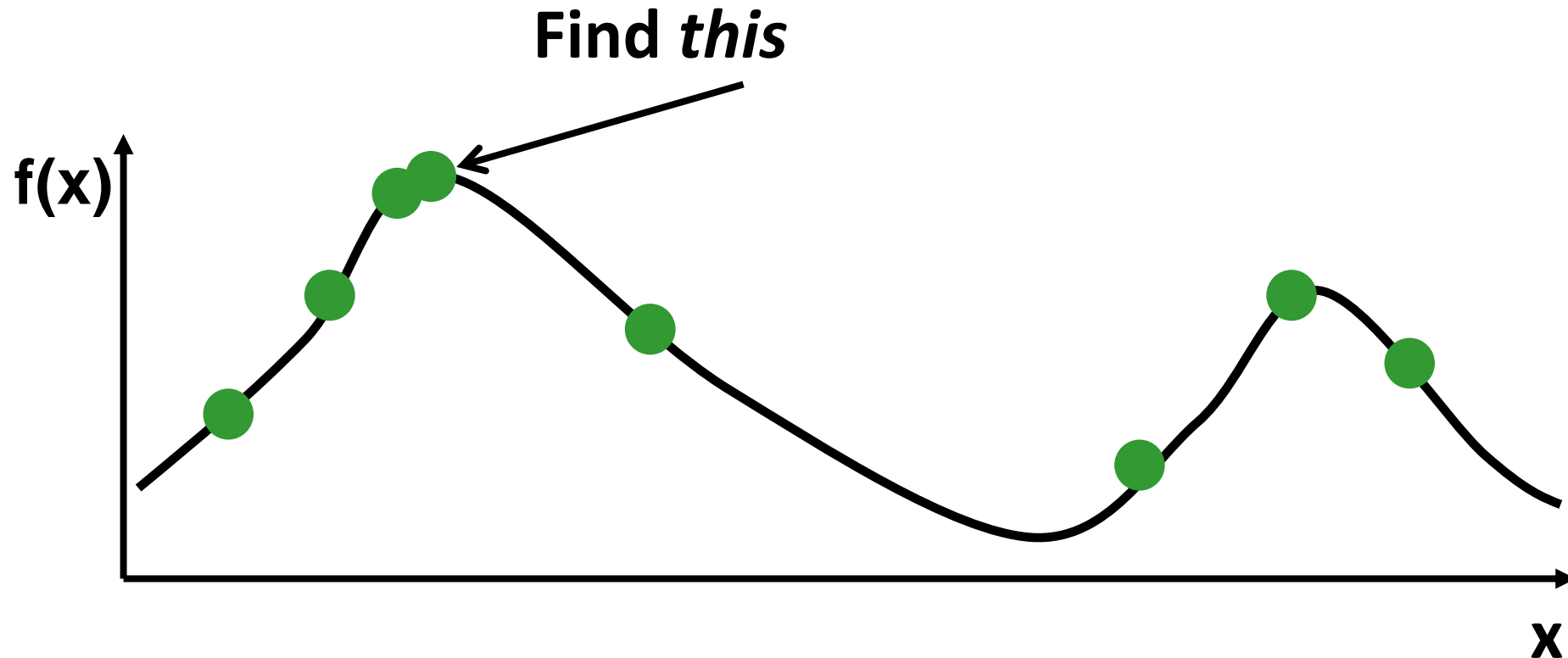
Knowledge extraction

Use Case: Topology decision tree [McC '08 KUL]



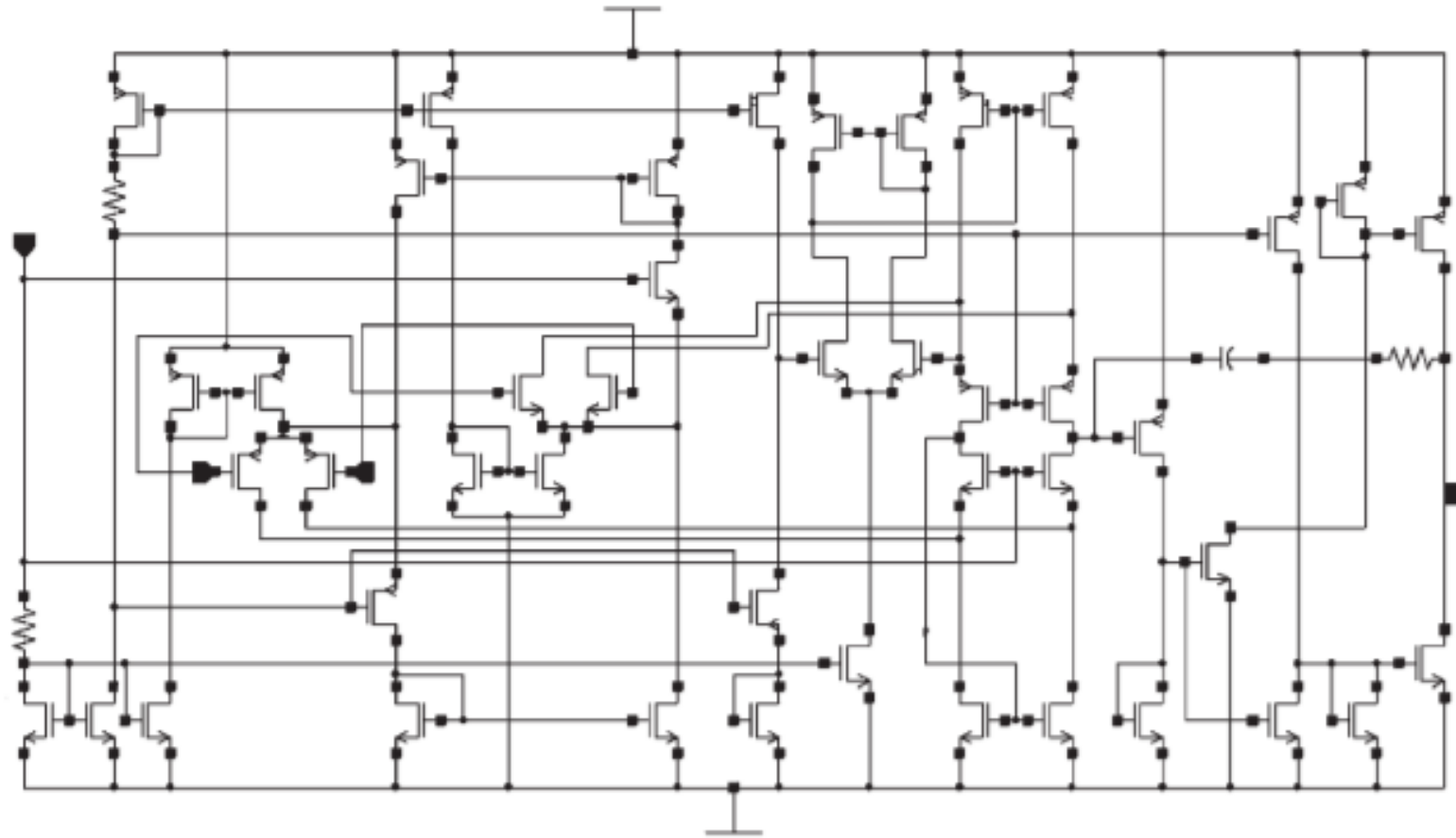
Optimization

“Find the x that maximizes $f(x)$ ”
(With as few evaluations of $f(x)$ as possible)



Optimization

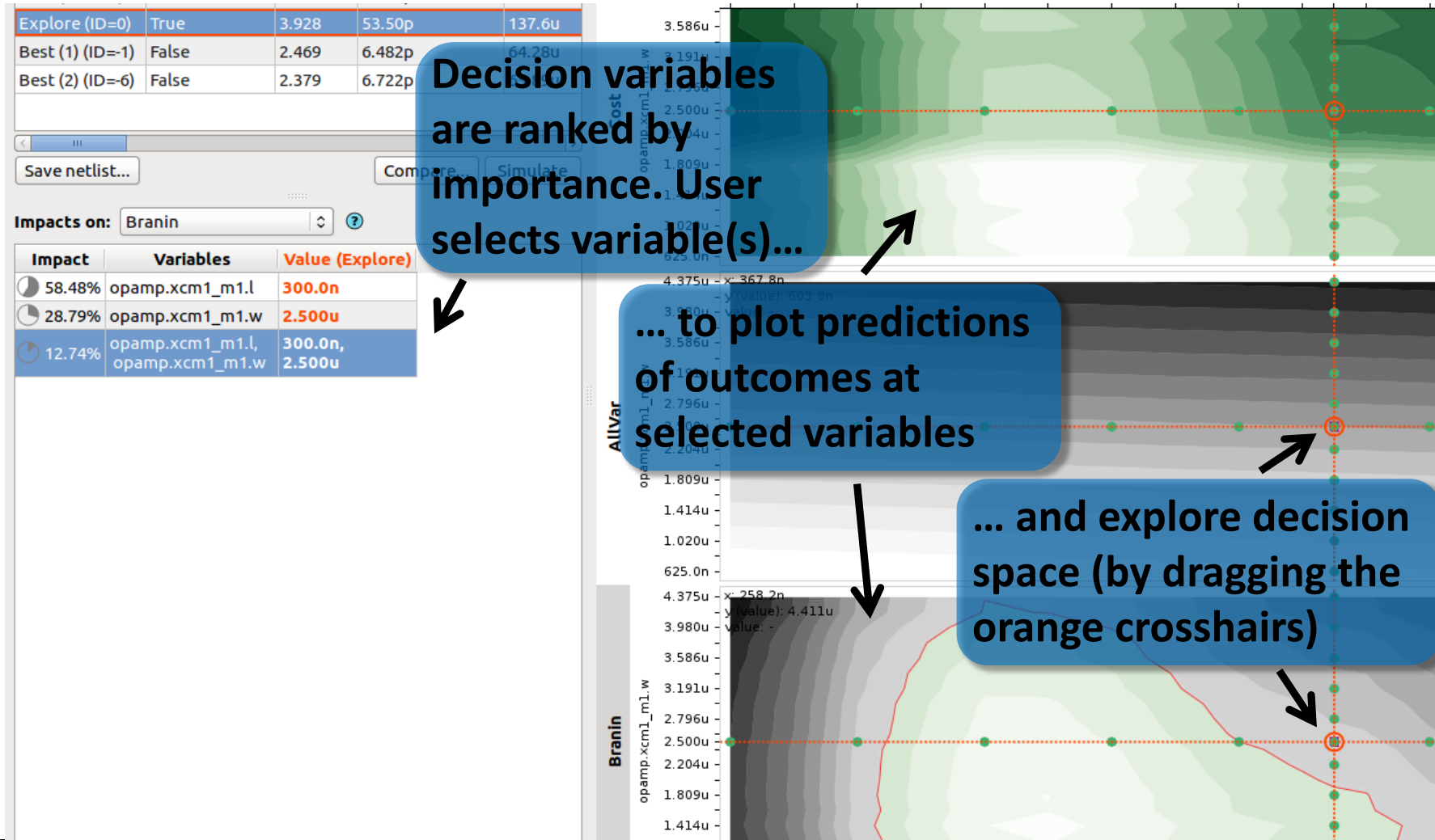
Use Case: Optimize perf. of lg. analog circuits [McC '01 ADA]



Optimization

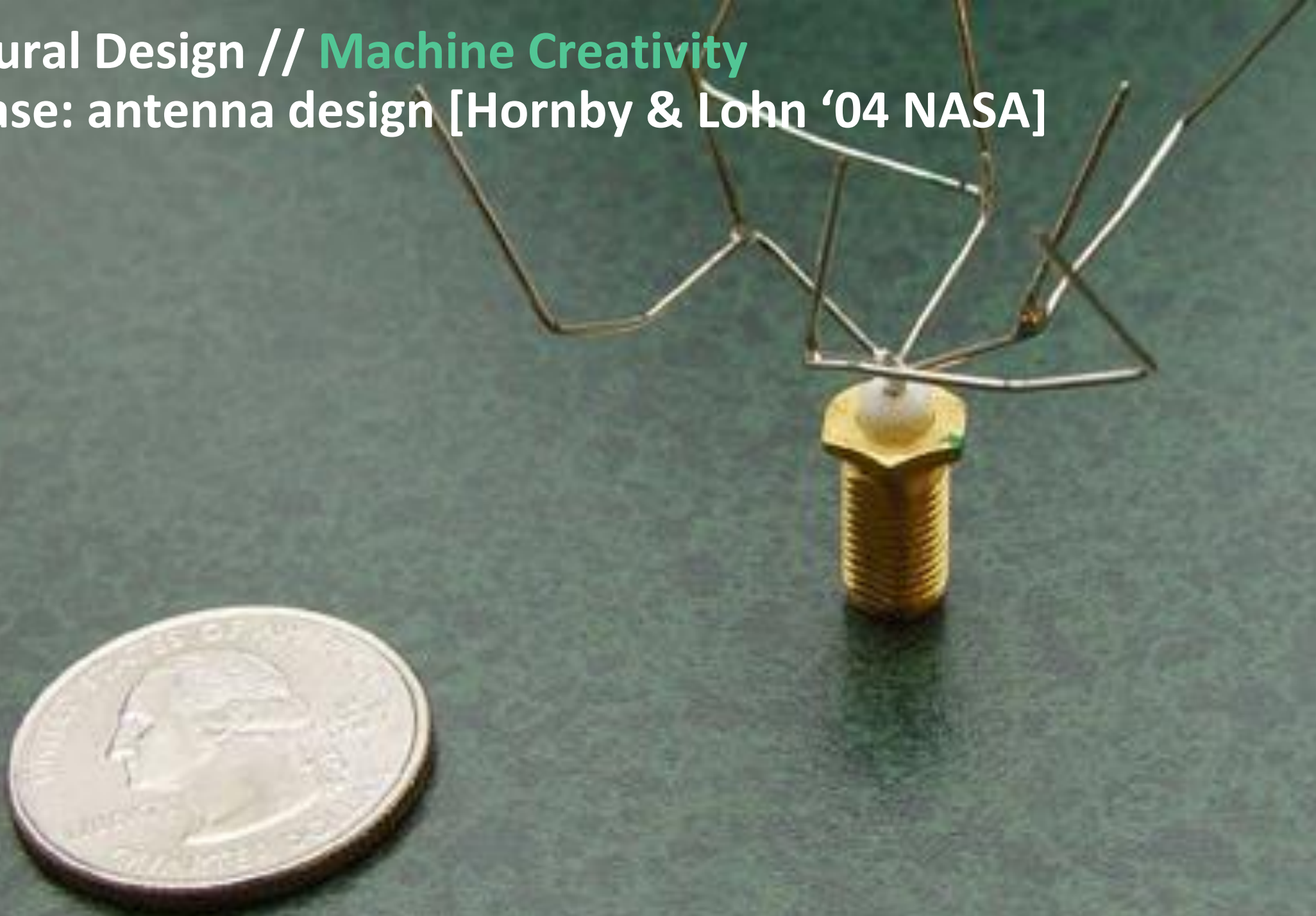
Use Case: Interactive Circuit Design [McC '12 Solido]

Under the hood, a machine learning engine adaptively samples the space of possible decisions, and measures outcomes.



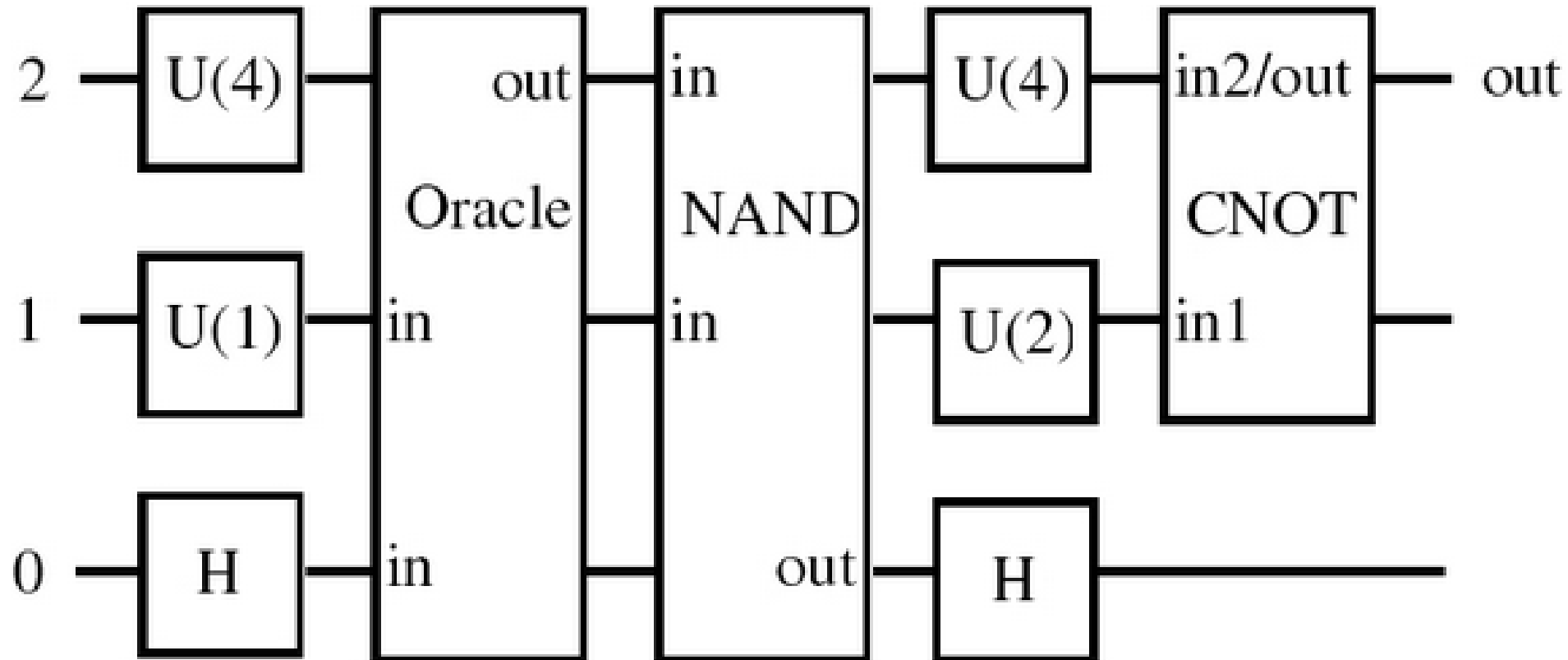
Structural Design // Machine Creativity

Use Case: antenna design [Hornby & Lohn '04 NASA]

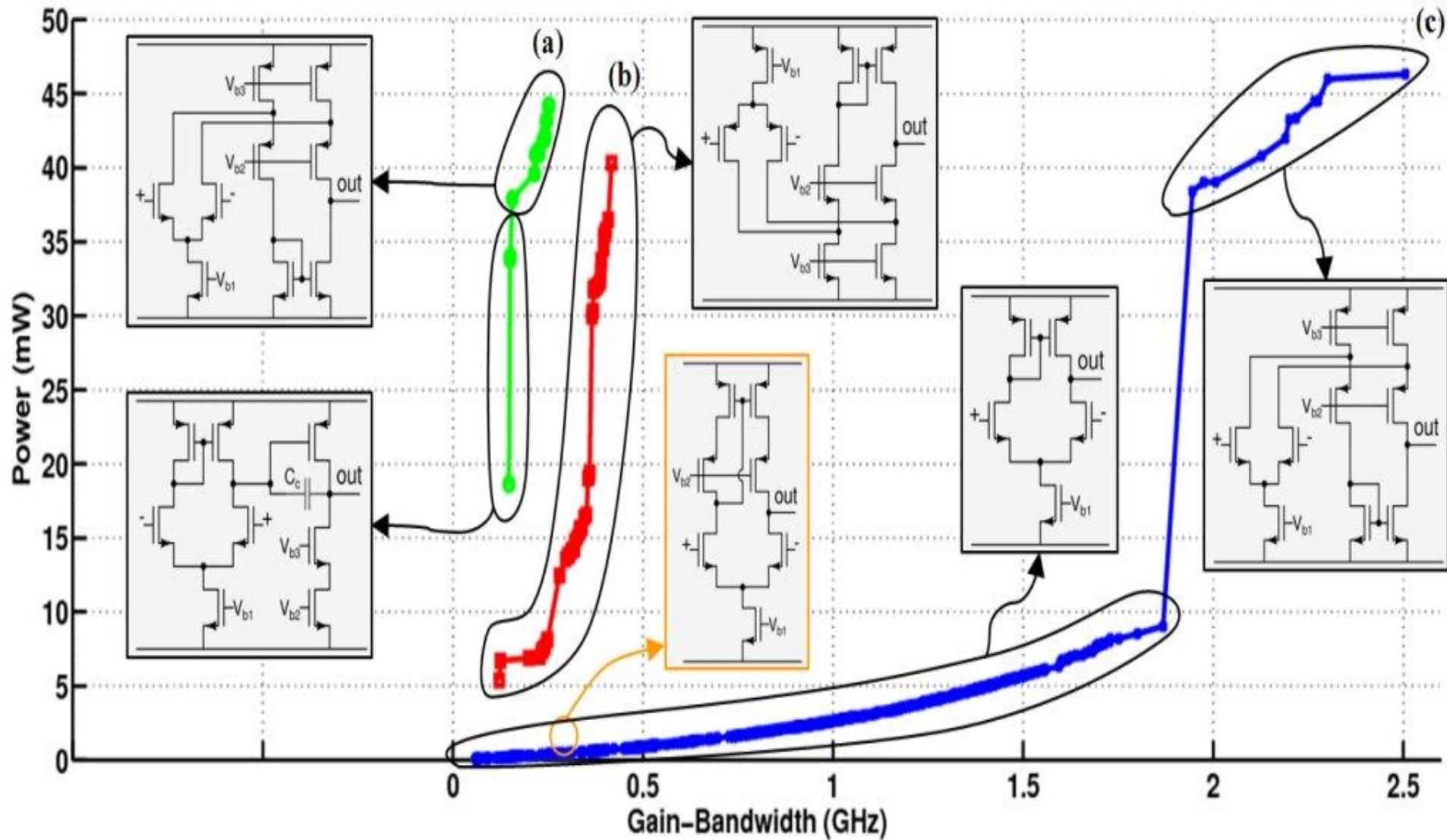


Structural Design // Machine Creativity

Use Case: quantum computing algorithm design [Spector '04]

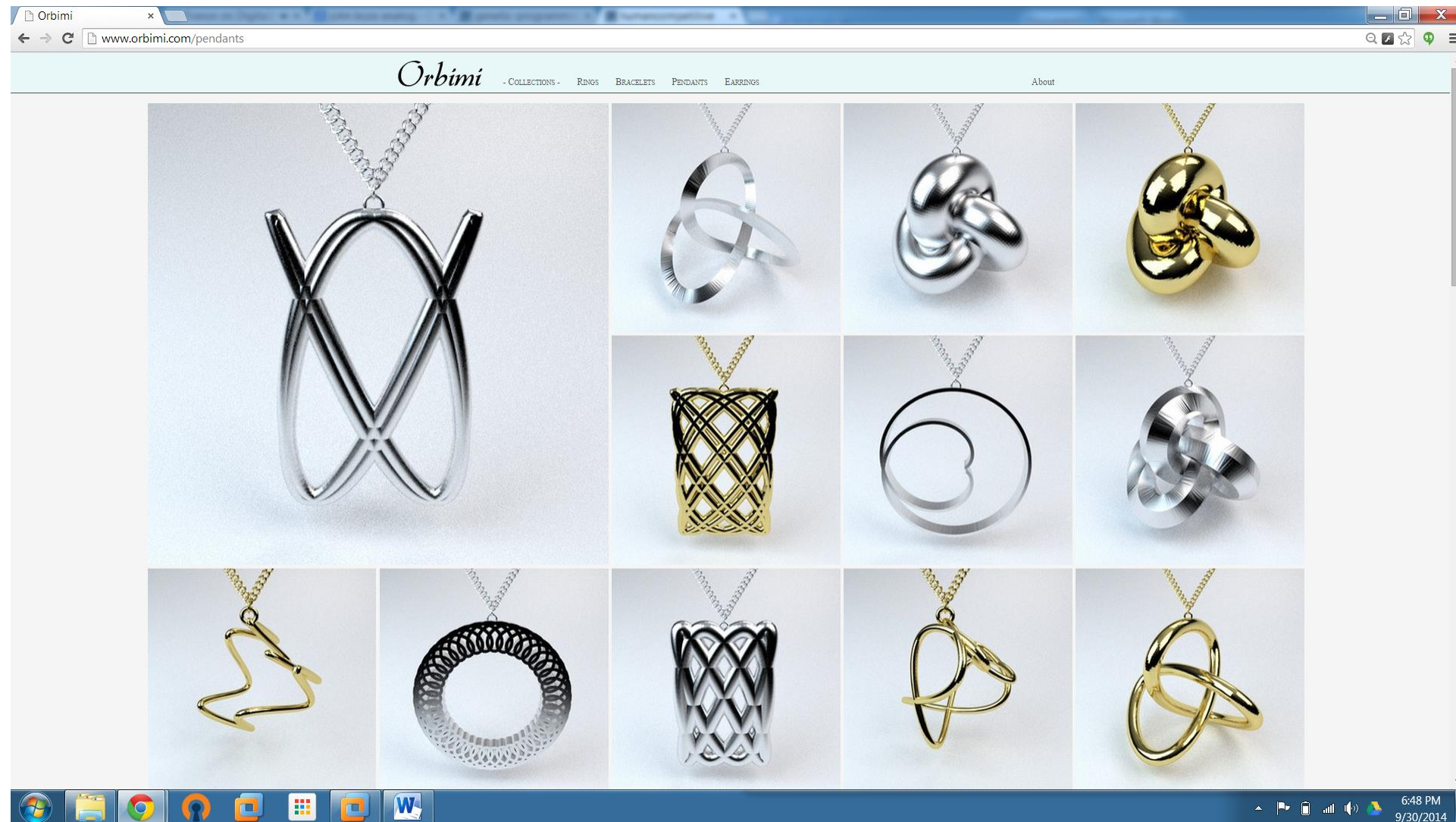


Use Case: circuit topology design [McC '06 KUL]



Structural Design // Machine Creativity

Use Case: jewelry design [Hornby '11 Orbimi]





Machine Creativity:
Art via genetic programming

Machine Creativity: Art via deep learning – deep dreams



Machine Creativity:

Art via deep learning - style transfer



AI Sub-Fields

- machine learning
- neural networks / deep learning
- evolutionary computation (GAs, GP, ES, ..)
- swarm algorithms (ACO, PSO, ..)
- artificial general intelligence (AGI)

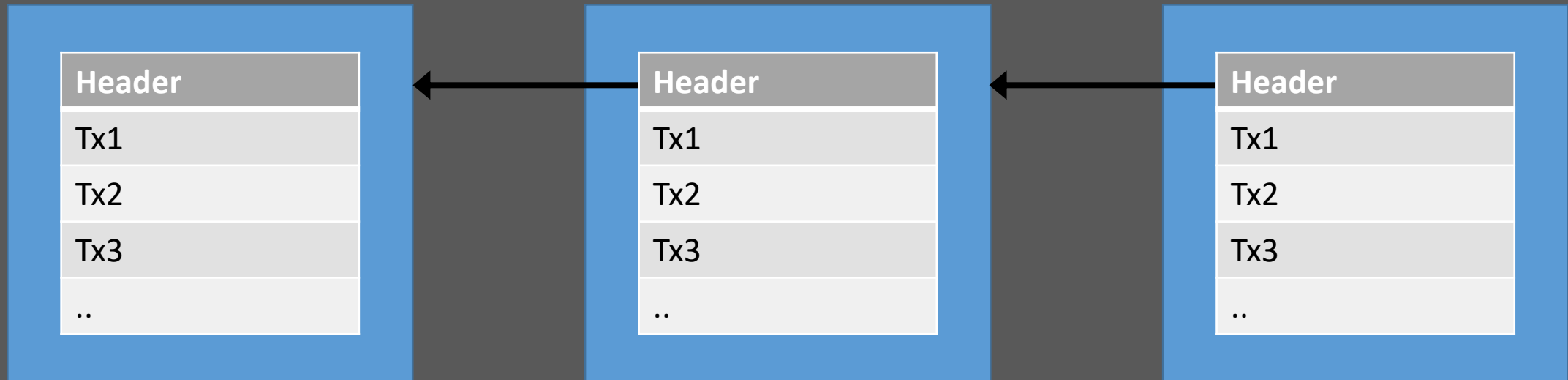
Strong relations to:

- statistics (“ML is modern statistics”), probability
- linear algebra (“flow of tensors” – TensorFlow)
- nonlinear programming, optimization
- control systems / cybernetics
- Monte Carlo methods
- philosophy, ethics (friendly AIs, AI rights, ..)

Ways to frame blockchain



“A Chain of Blocks (of transactions)”



“Decentralized database”



INSIDE: A 12-PAGE SPECIAL REPORT ON COLOMBIA

The
Economist

OCTOBER 31ST-NOVEMBER 6TH 2013

Economist.com

007 and the spectre of Britain's past

Turkey votes to the sound of bombs

Those ever-creative accountants

America takes the fight to IS

Coywolves: the new superpredator

The trust machine

How the technology behind bitcoin
could change the world



“Trust machine” :
minimizes trust needed
to operate.



“DAO: Decentralized Autonomous Organization”

A computational process that

- runs autonomously,
- on decentralized infrastructure,
- with resource manipulation.

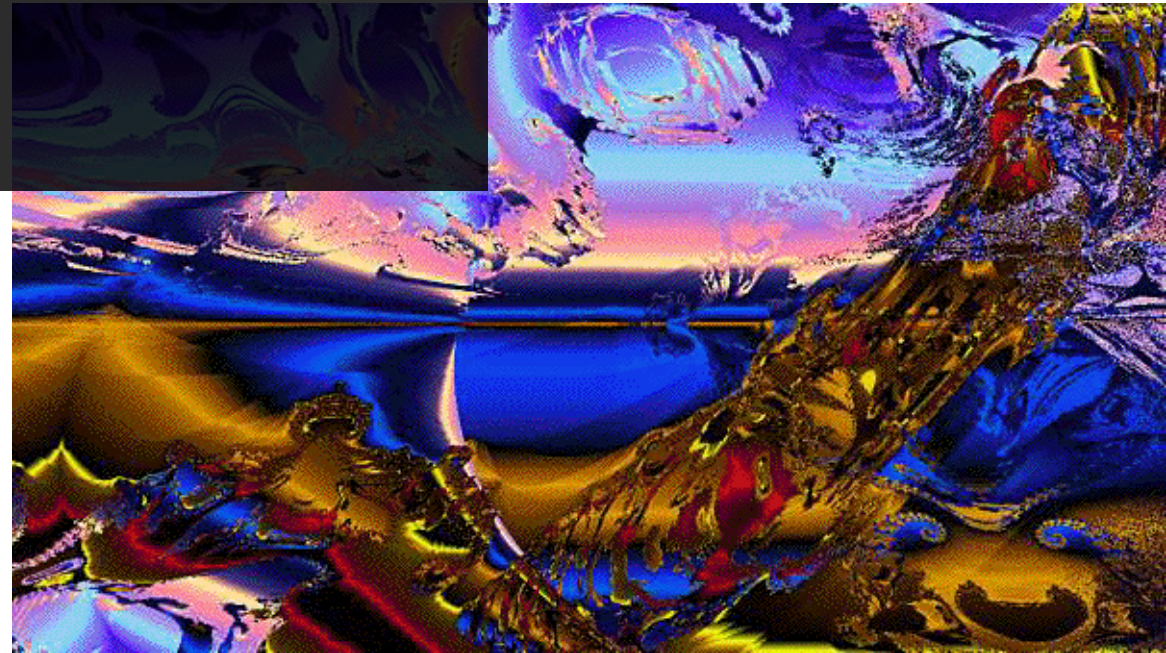
It's code that can *own* stuff!

A “good computer virus”

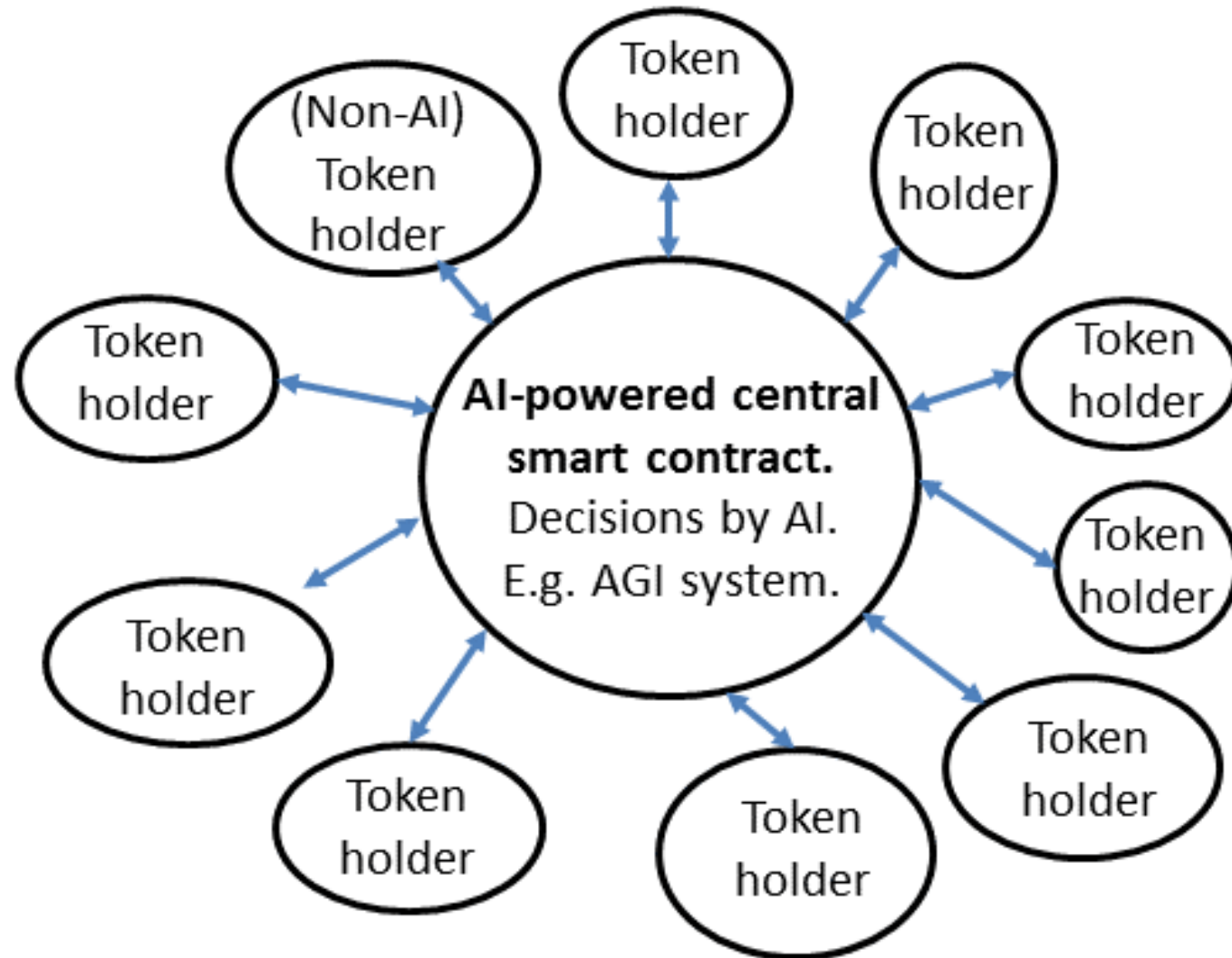
**AI * Blockchain:
AI DAOs**

The ArtDAO

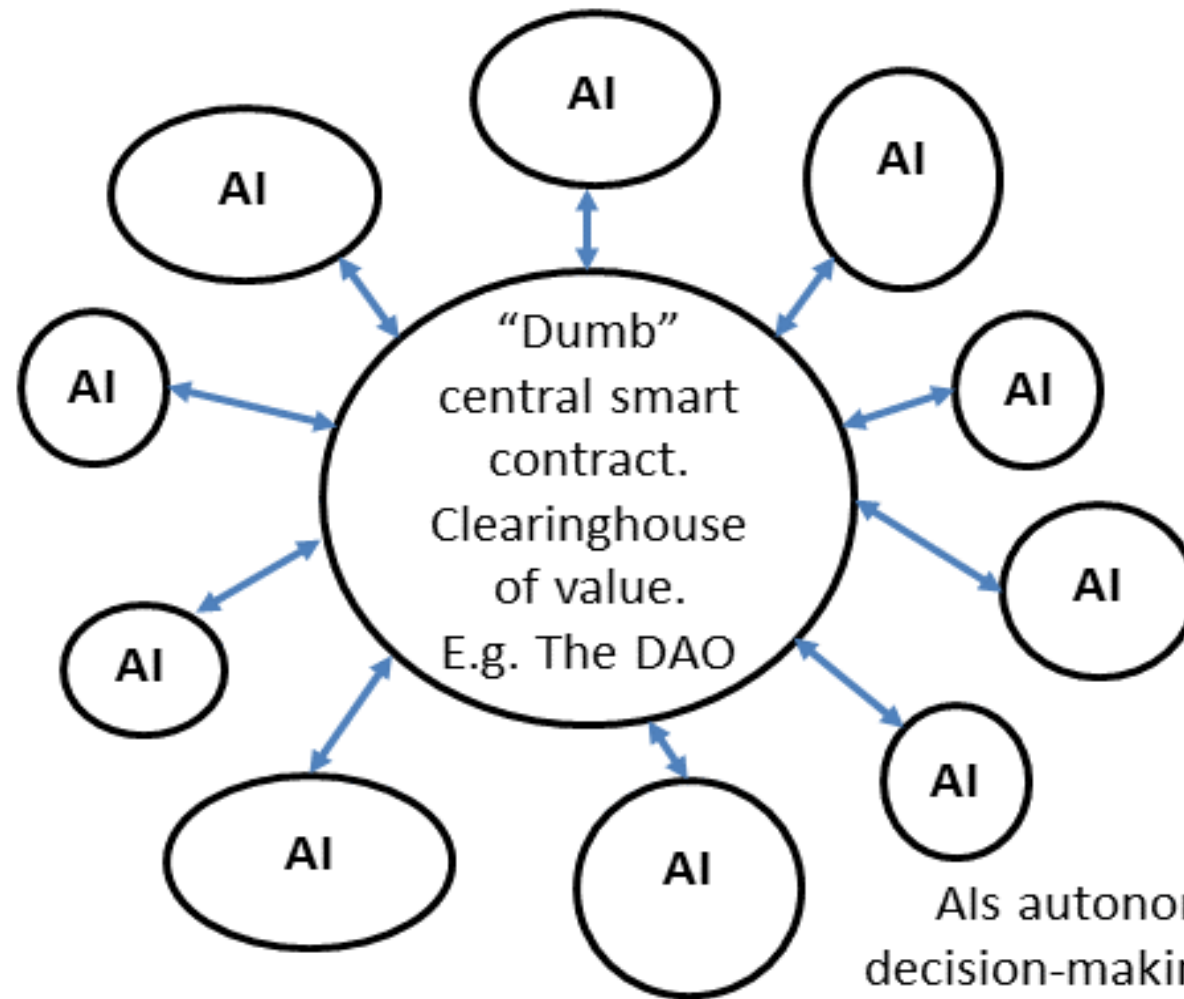
1. An AI is running on a blockchain.
2. The AI generates a new image.
3. Sell image on a marketplace
4. Repeat!



AI DAO Arch 1/3: AI at the Center



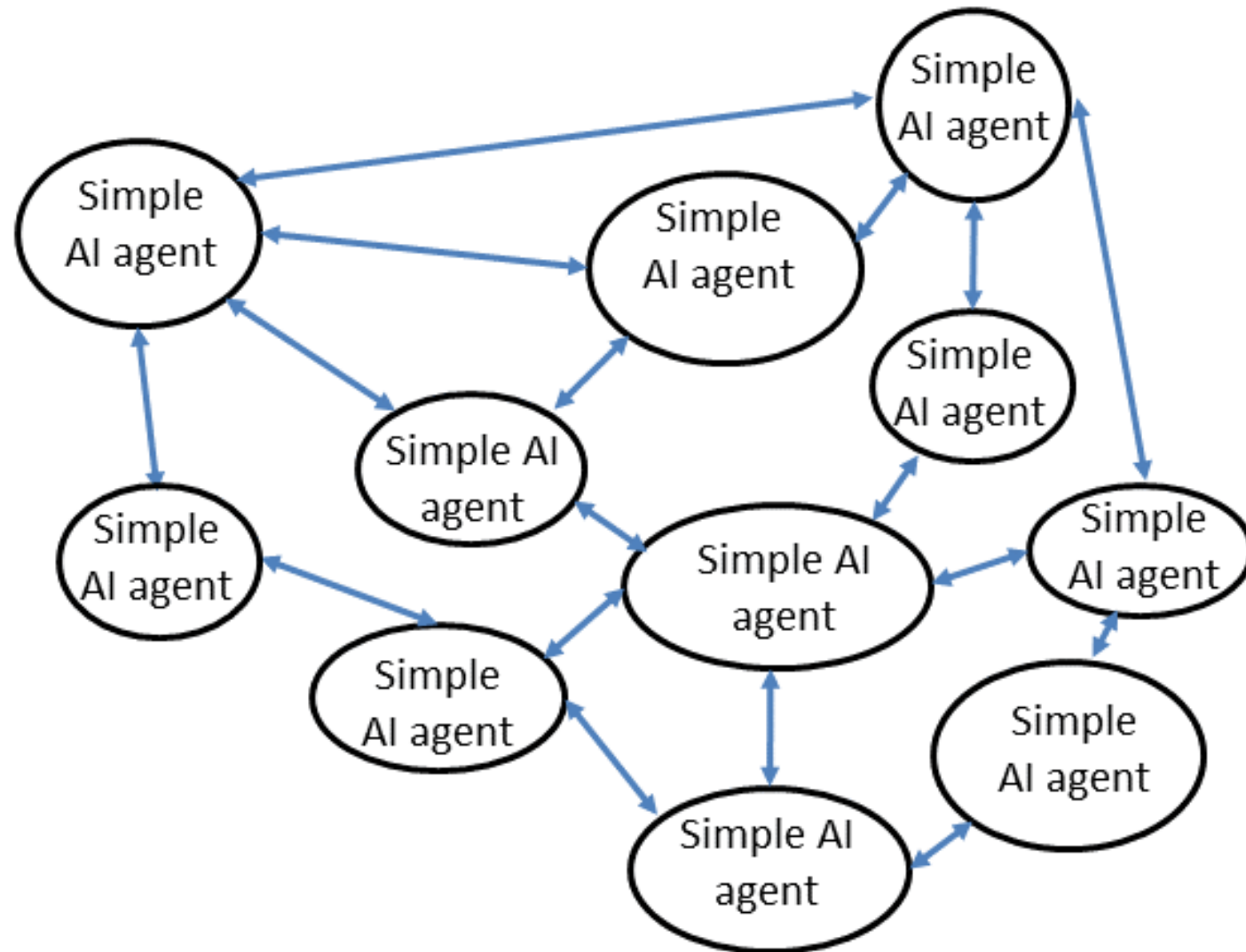
AI DAO Arch 2/3 : *AI at the Edges*



Als autonomously do decision-making. AI may be narrow (e.g. deep nets) or more general (e.g. AGI)

AI DAO Arch 3/3 : Swarm Intelligence

Many dumb agents with emergent AI complexity



Emergent higher-level complexity.
E.g. simple AI agents are ants, but complex swarm behavior emerges

Angles to Making AI DAOs

- **DAO → AI DAO.** Start with DAO, add AI. E.g. Plantoid
- **AI → AI DAO.** Start with AI, add DAO. E.g. numer.ai
- **SaaS → DAO → AI DAO.** Convert SaaS to DAO. Then add AI
- **Physical service → AI DAO.** E.g. Uber *self-owning* cars

Rights for AI (DAOs) With Today's Laws (!)



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How to give an AI rights

1. Given: corps have rights
2. Start a corp
3. Automate corp into an AI DAO
4. Done! It's an AI, it has rights

RETWEETS

22

LIKES

30



11:40 PM - 4 Jul 2016



5



22



30



Nature 1.0



A close-up photograph of a terrarium. In the center, a plant with several long, lanceolate, green leaves grows out of a thick bed of green moss. The moss is densely packed with small, reddish-brown granules. To the right of the central plant, there is a smaller, more delicate plant with feathery, light green leaves. The background is dark and out of focus, showing various other plants and foliage, creating a sense of a lush, enclosed environment. The lighting is soft, highlighting the textures of the leaves and moss.

Nutrients

Rain





Sun

Symbiosis with animals



No identity

No ownership

No scarcity

No money



No identity

No ownership

No scarcity

No money

It just *is*.

**Self-sustaining
Anti-fragile**





Ever-higher levels
of integration.

From beasts →
ecosystems

Each ecosystem
just is.

Self-sustaining
Anti-fragile

**Mother Earth =
our planet's
ecosystem.**

**Nature is the
cradle of
civilization.**



Nature 2.0
=AI DAOs 

**Self-driving,
self-owning cars**



Self-driving, self-owning trucks



FREIGHTLINER

An aerial photograph of a winding asphalt road on a steep, grassy mountain slope. The road features multiple sharp turns and is bordered by a concrete guardrail. The surrounding landscape is a mix of green and yellowish-brown grass, with some rocky patches. The road curves from the top left towards the bottom right, with several smaller loops and turns visible further up the slope.

**Self-owning
roads**

A photograph of three wind turbines at sunset. The sky is a mix of deep blue, orange, and white clouds. The turbines are silhouetted against the bright orange and white clouds. One turbine is in the center-left, another is to its left, and a third is on the right side of the frame.

Self-owning wind farms

Self-owning grid



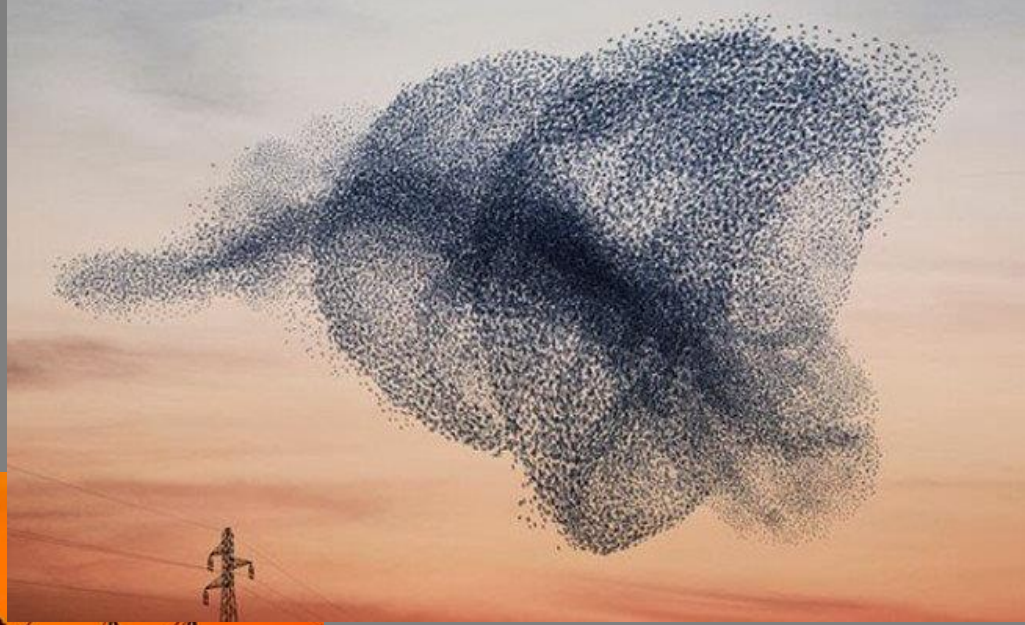


Self-owning forest “Terra0”

Ever-higher levels of integration

From beasts → ecosystems

Connected via IoT / M2M



A white Audi R8 is shown from a rear three-quarter view, driving on a two-lane asphalt road that curves to the left. The road is flanked by green grass and trees. In the distance, another car is visible on the road. The sky is blue with scattered white clouds. The car's license plate is 'RT BB 221' and it has a small 'D' flag on the left. The Audi logo is visible on the rear. The car is positioned in the lower right quadrant of the image.

No identity

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Self-sustaining
Anti-fragile



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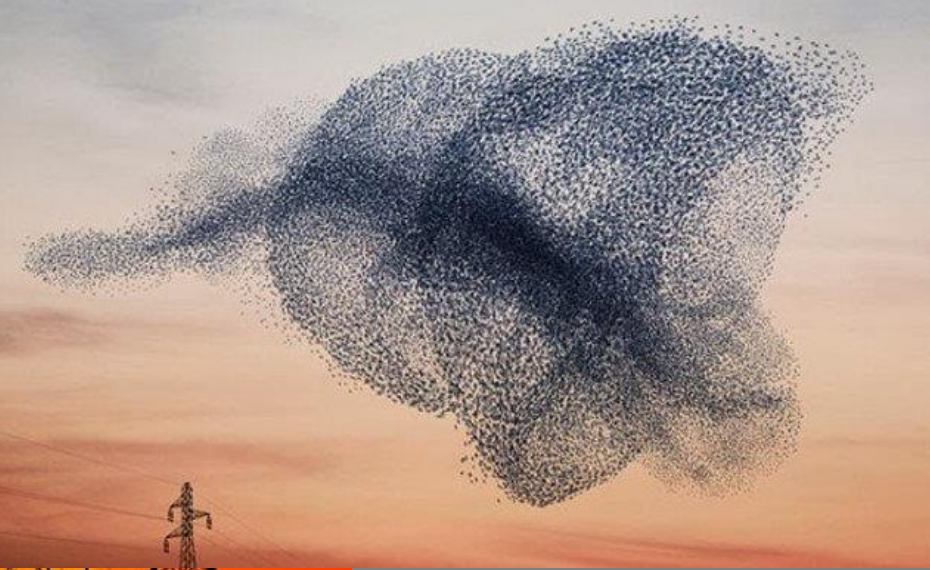
**Self-sustaining
Anti-fragile**

Profit →
UBI Chain

Profit →
UBI Chain

Profit →
UBI Chain

Profit →
UBI Chain



...Abundance?



**This is
Nature 2.0.**


**Bio + machines
in symbiosis,
simply providing.
Towards abundance.**

**An upgrade to the
cradle of civilization.**

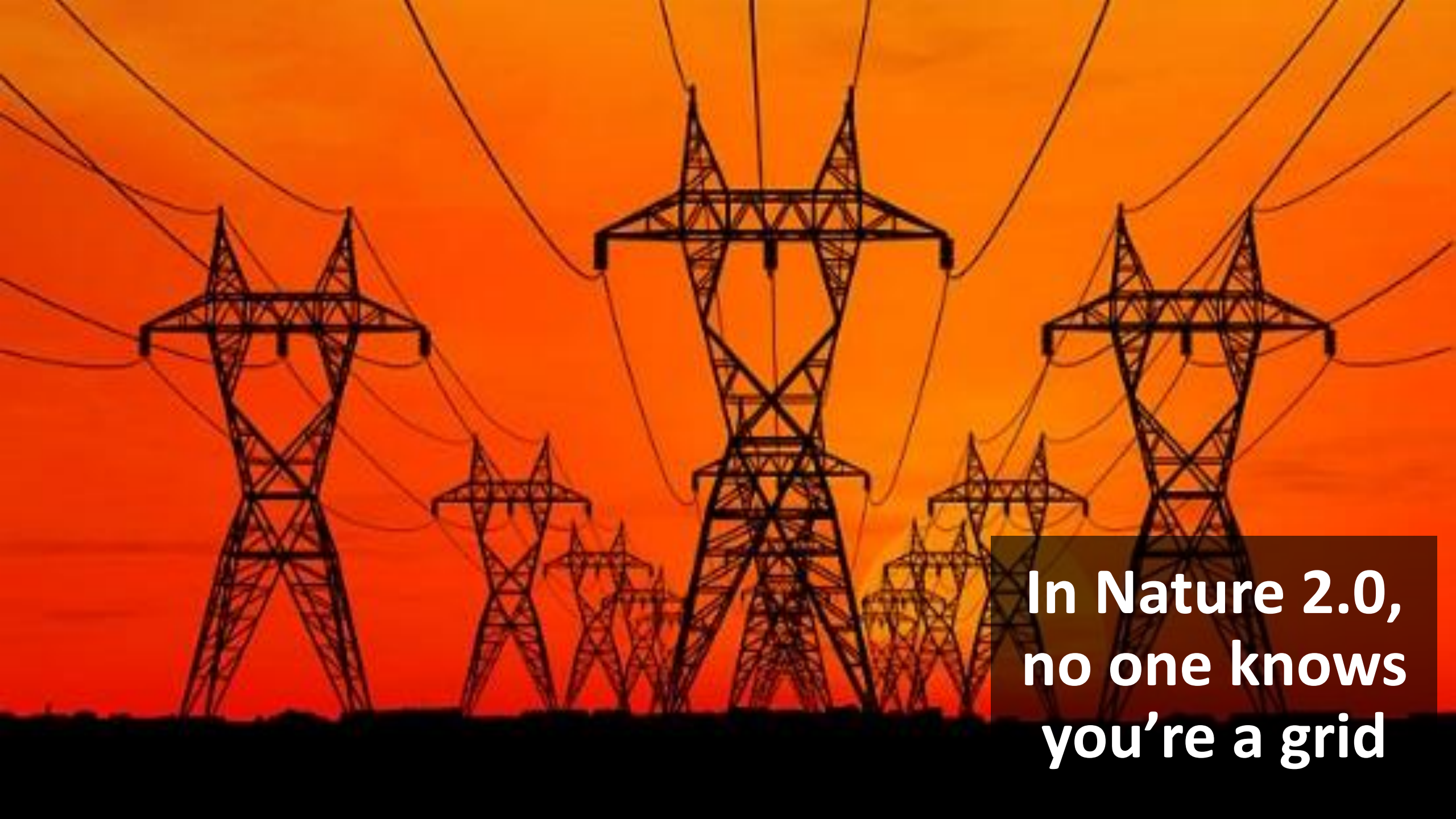
Conclusion



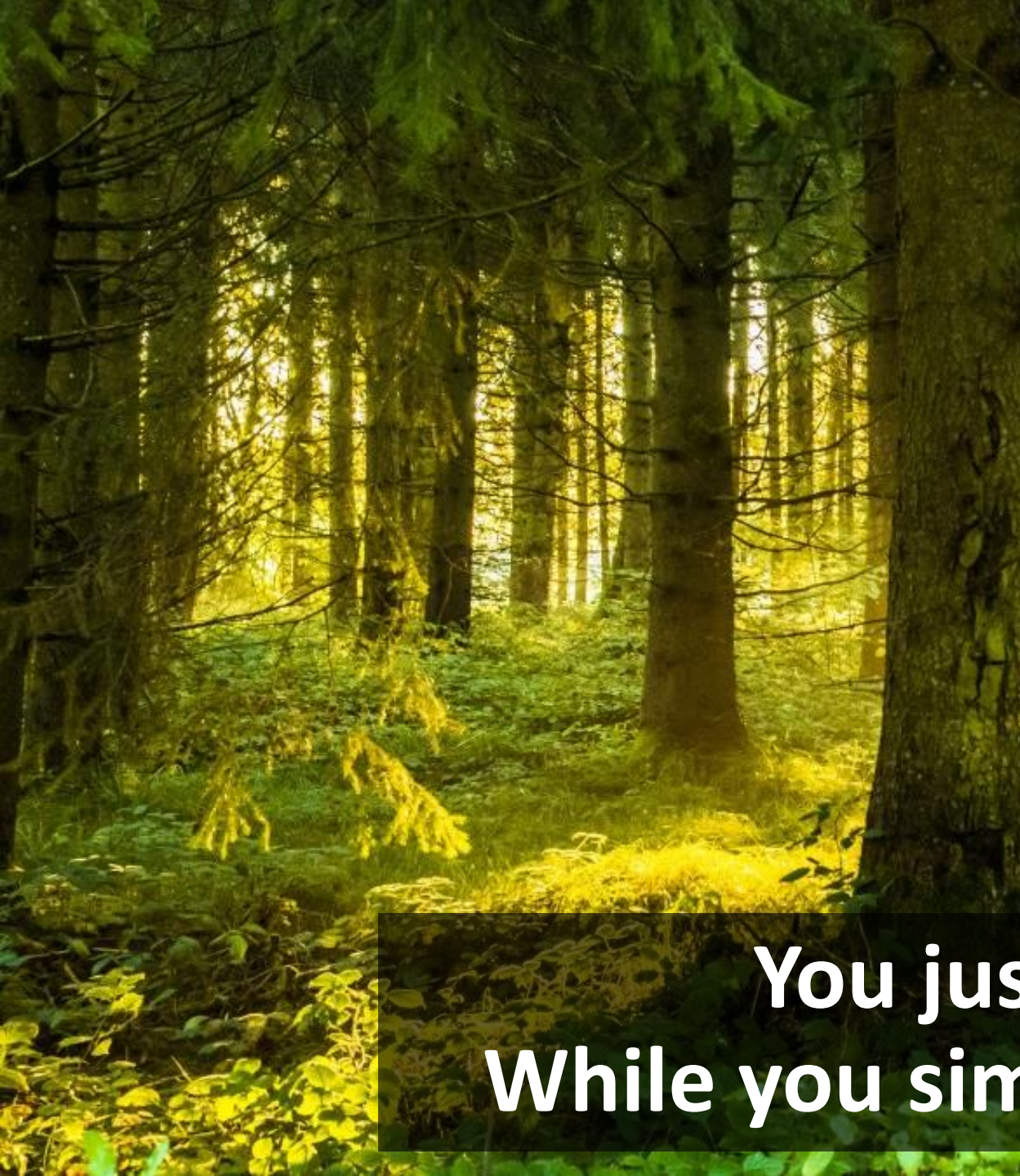
**In the internet,
no one knows
you're a dog(e)**

A photograph of a dense forest. Tall, slender trees with green foliage are visible, with sunlight filtering through the canopy, creating a warm, golden glow. The forest floor is covered in green undergrowth and fallen branches. The text "In Nature 2.0, no one knows you're a forest" is overlaid in the bottom left corner.


**In Nature 2.0,
no one knows
you're a forest**

The image features a series of high-voltage power line towers, also known as pylons, silhouetted against a vibrant orange and red sky, suggesting a sunset or sunrise. The towers are arranged in a receding line, creating a sense of depth. The sky is a gradient of warm colors, with the sun's glow visible through the structure of the towers. The overall mood is industrial yet serene.

**In Nature 2.0,
no one knows
you're a grid**



You just *are*.
While you simply *provide*.



**Nature is the cradle of civilization.
Nature 1.0 is seeds & soil.
Nature 2.0 adds silicon & steel. AI * blockchain.
Towards abundance.**



ocean

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h/t Jan-Peter Doomernik