

August  
2019

Issue no. 002



# THE NEURON

Artificial Intelligence Magazine

## Billion Dollar Startup

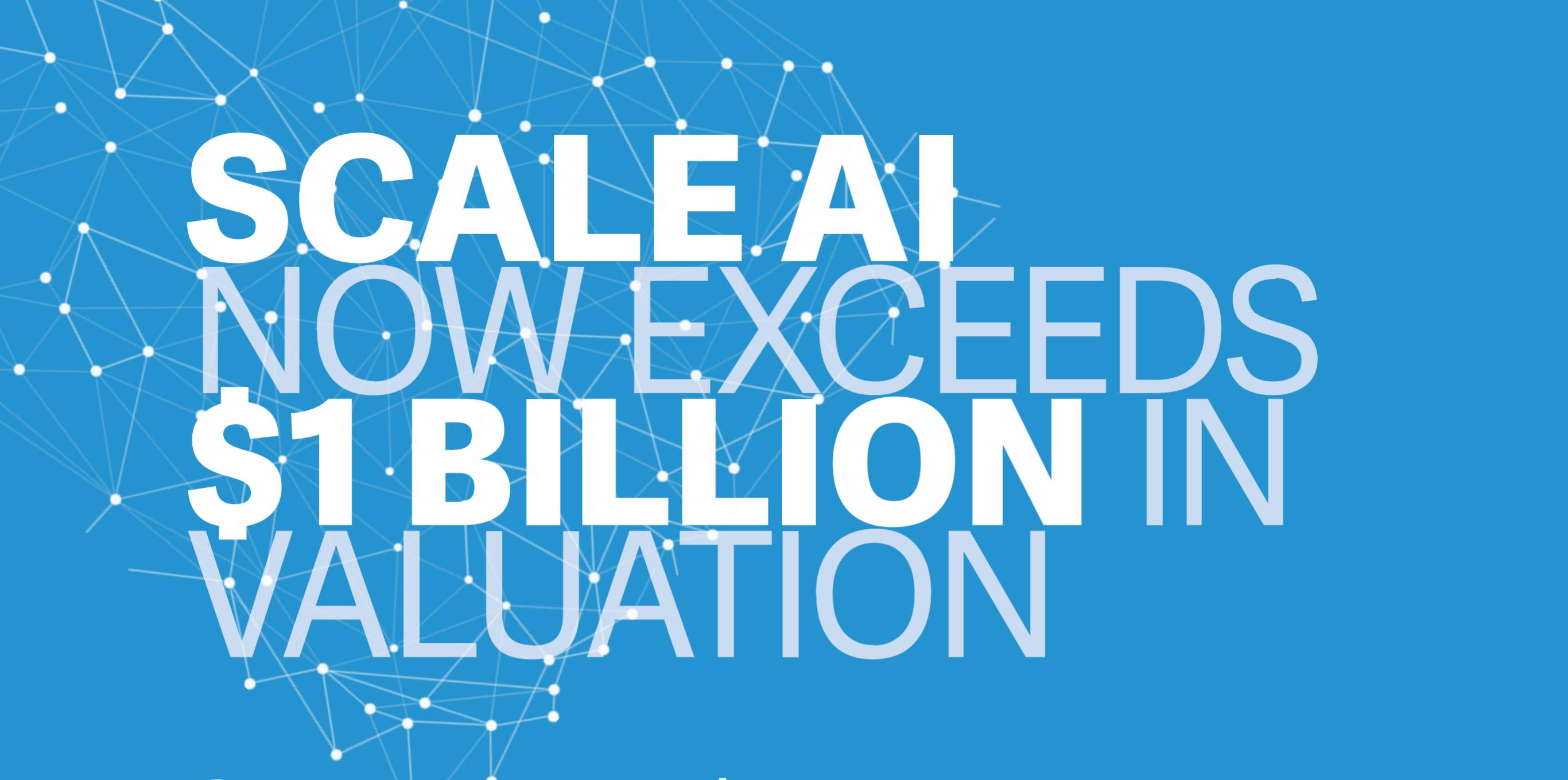
Scale AI

## AI for Food

Blue River Technology

## AI Startup Founder

Ankur Dinesh Garg



# SCALE AI NOW EXCEEDS \$1 BILLION IN VALUATION

Can you guess how many contractors does Scale AI have?

- A) 0
- B) 10
- C) 500
- D) *More than 30,000*

*Fun Fact – Alexandr Wang, the founder and CEO of Scale AI, is 22 years old and an MIT dropout*

# SCALE AI HAS MORE THAN 30,000 CONTRACTORS

These **human contractors** help Scale AI annotate or label data. The business model of Scale AI:

Client  
sends an  
image



# SCALE AI HAS MORE THAN 30,000 CONTRACTORS



Scale AI sends the image  
to contractors...

Client  
sends an  
image

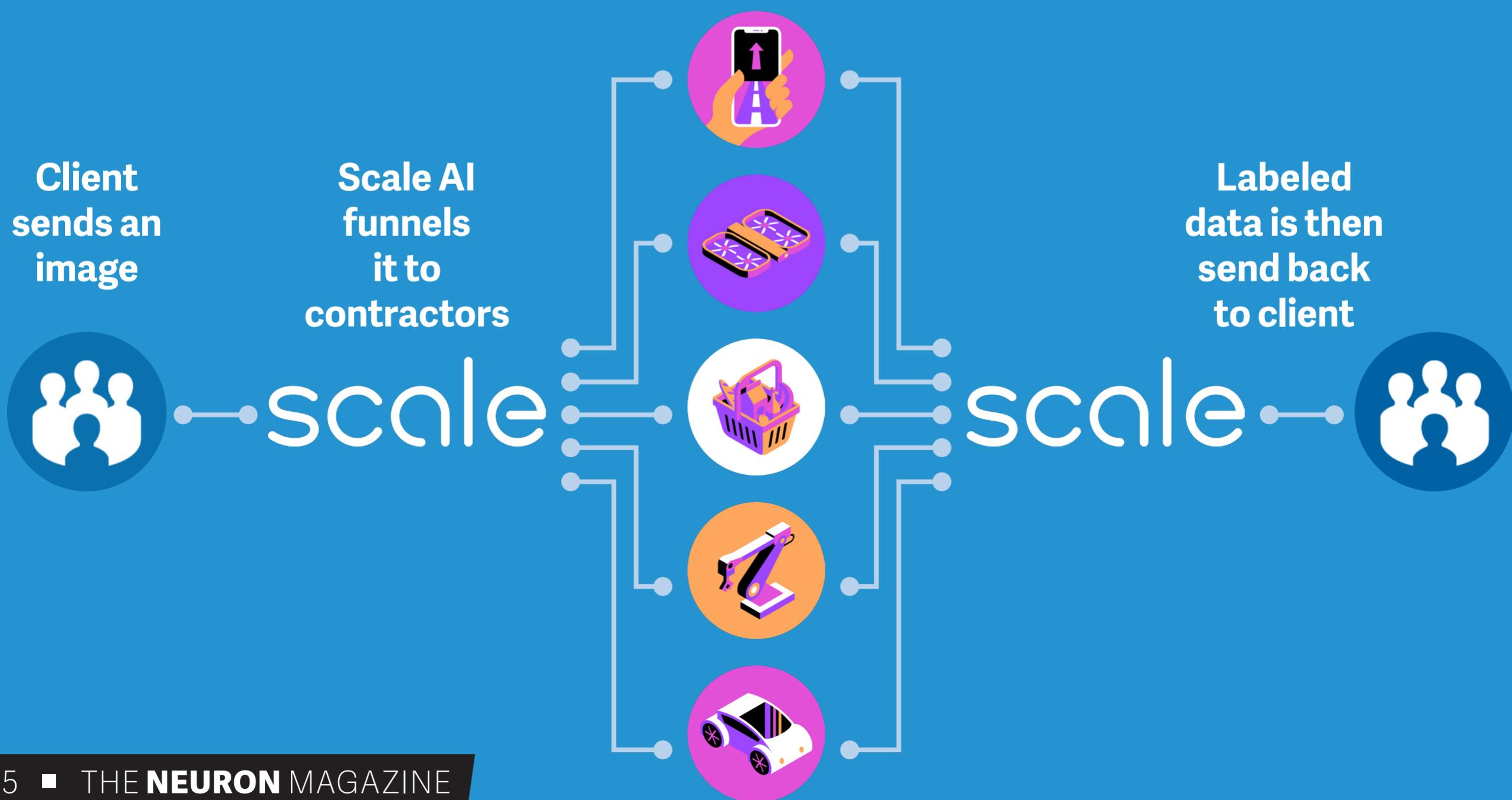
Scale AI  
funnels  
it to  
contractors

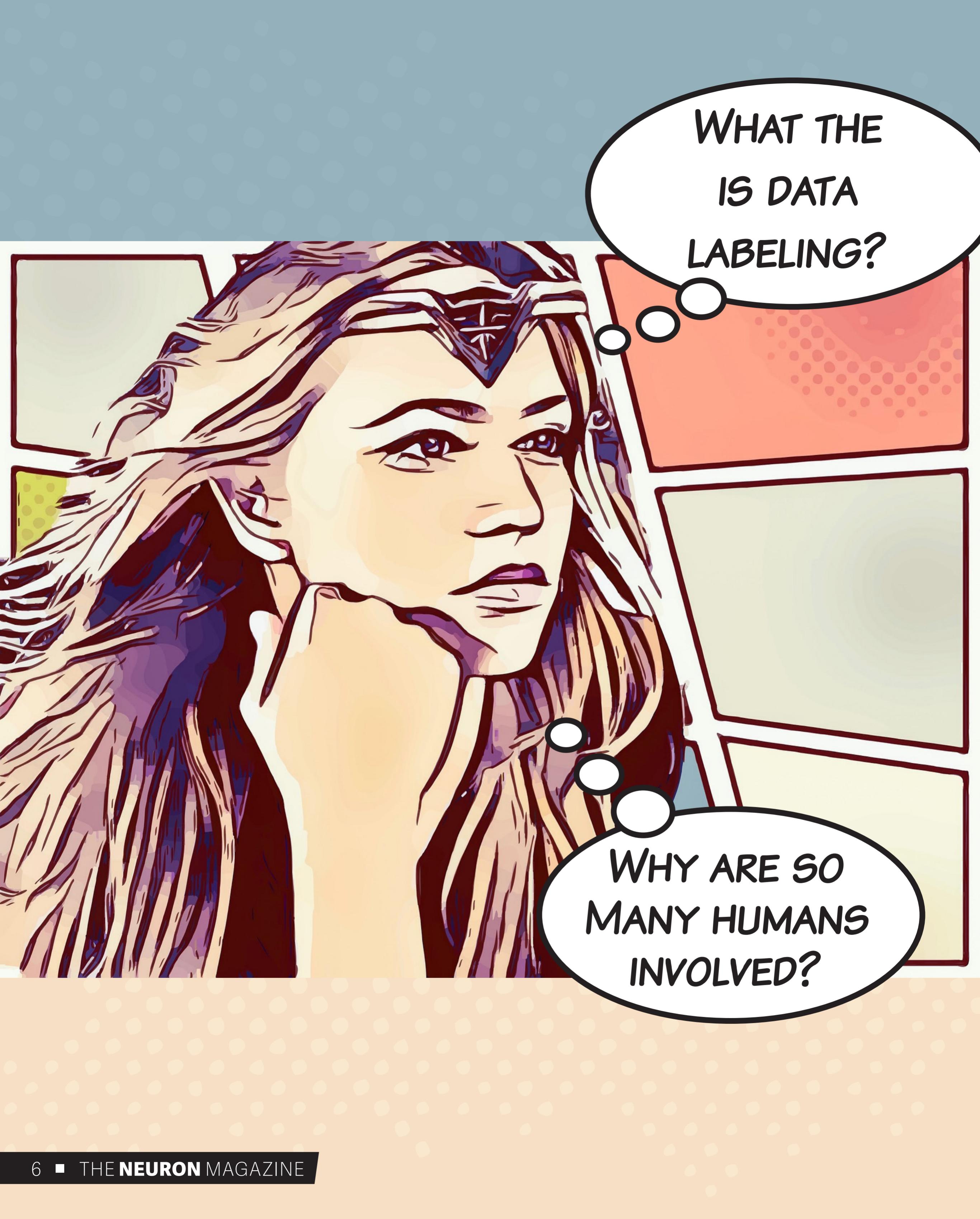


scale

# SCALE AI HAS MORE THAN 30,000 CONTRACTORS

**Contractors annotate the data and send it back to Scale AI. After Quality checks, Scale AI sends annotated image back to client**





WHAT THE  
IS DATA  
LABELING?

WHY ARE SO  
MANY HUMANS  
INVOLVED?

# To understand this, let's use the example of **self-driving cars**

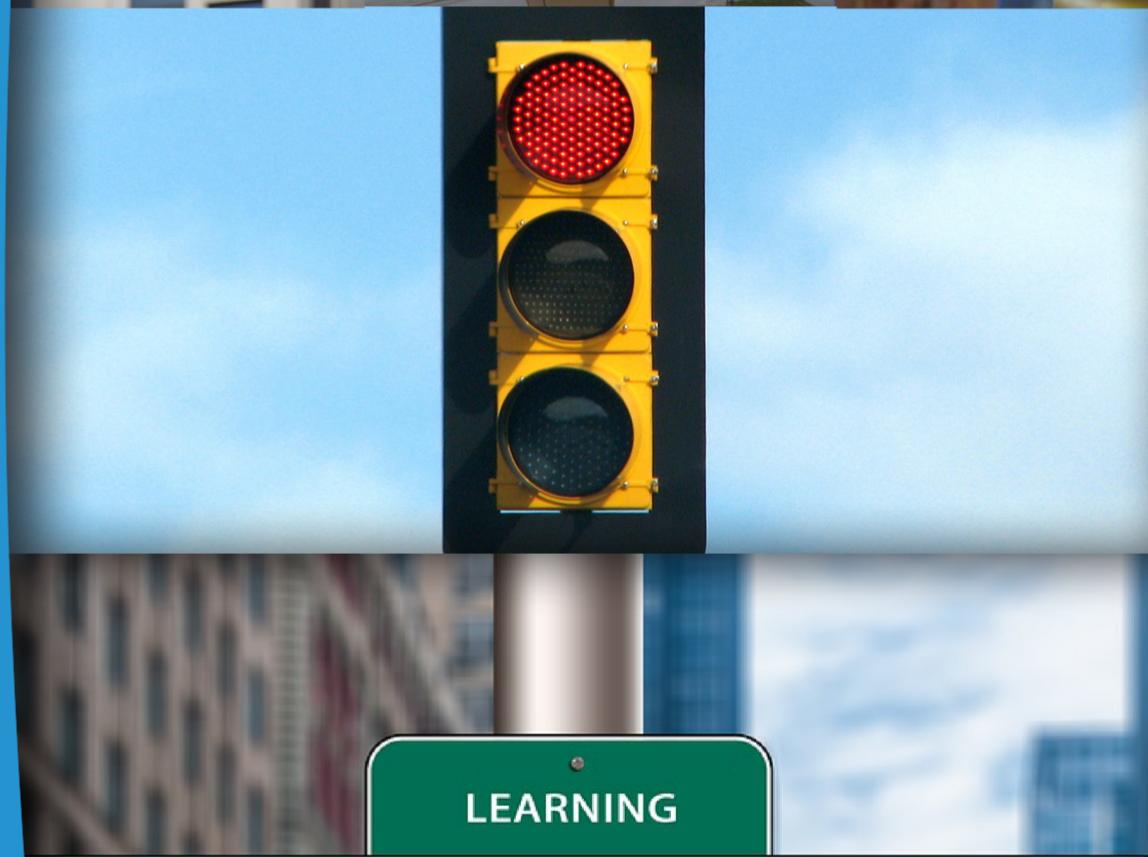
Just like you and me, **the deep learning algorithm** for self-driving car **needs to be aware** of the surrounding. **It has to know** if pedestrians are crossing the road, if traffic lights are present, recognize one-way lanes, construction, emergency vehicles, and **many other things** we notice



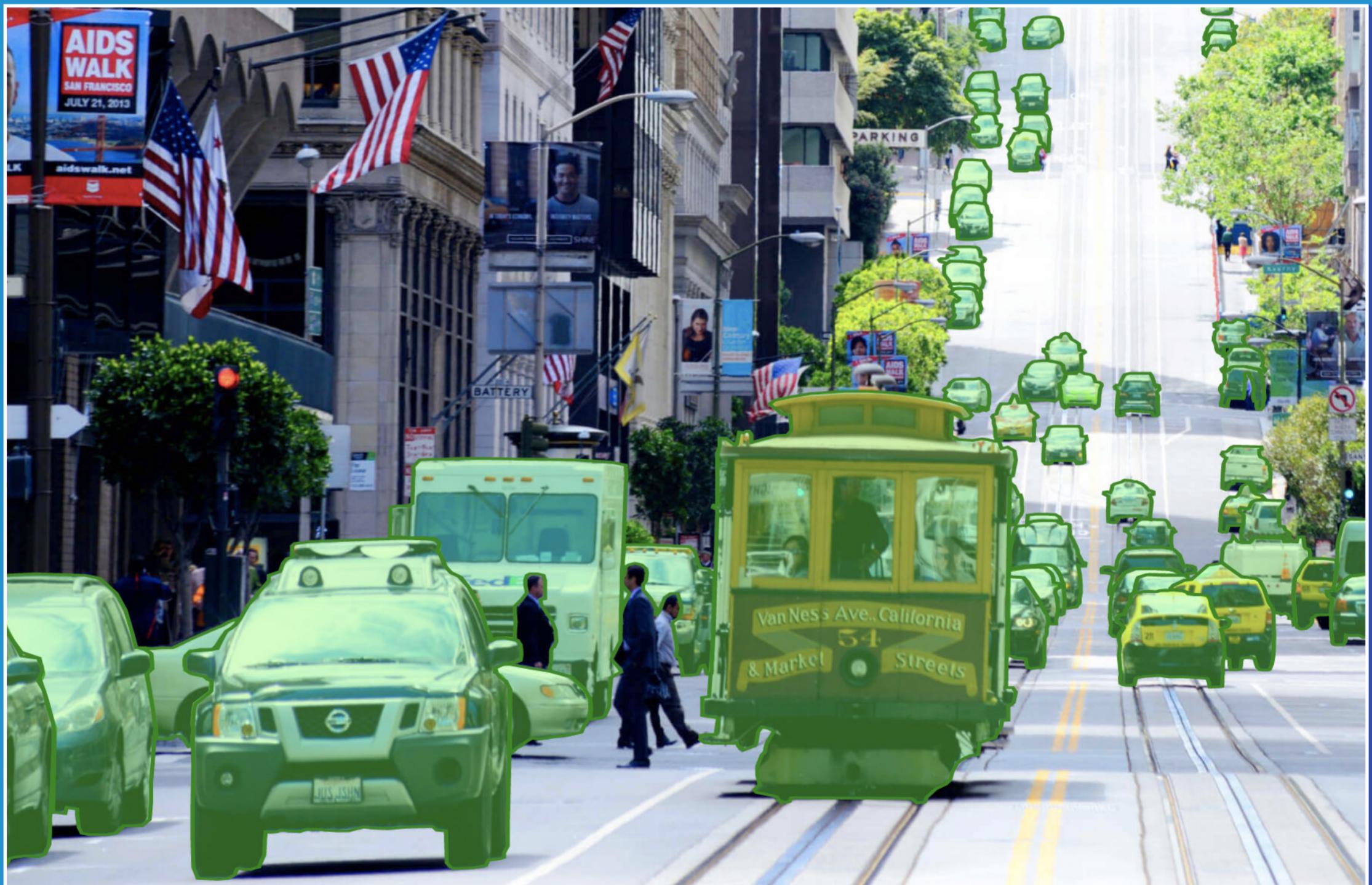
# Deep learning algorithms are trained on millions of images

The idea is to train algorithms on as many **accurate** images as possible and the **algorithm then learns** from these images.

For the algorithm to identify traffic lights, **you first have to train it** on thousands of different types of traffic lights



When it comes to self-driving cars, the accuracy of the algorithm depends on accurately identifying items within the images



Would you be comfortable  
in a self driving car  
at 75 miles/hour which  
fails 3 out of every 100  
times?

**“97% accuracy is not enough.  
You need 99.99% accuracy.”**

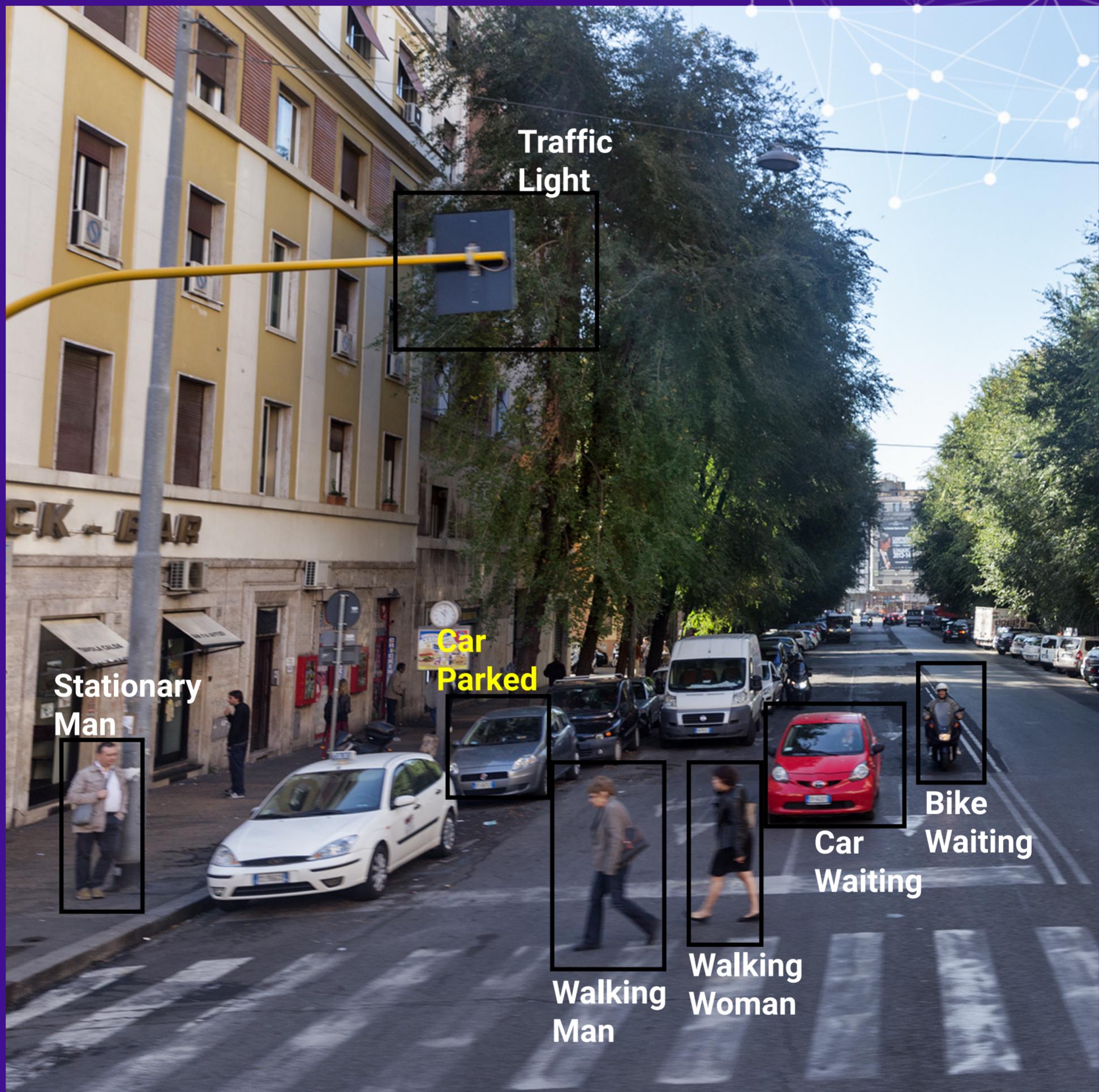
*Andrei Karpathy  
- Senior Director of Artificial Intelligence, Tesla*

That is where **humans** come into play as they **help** annotate data and **increase** overall accuracy

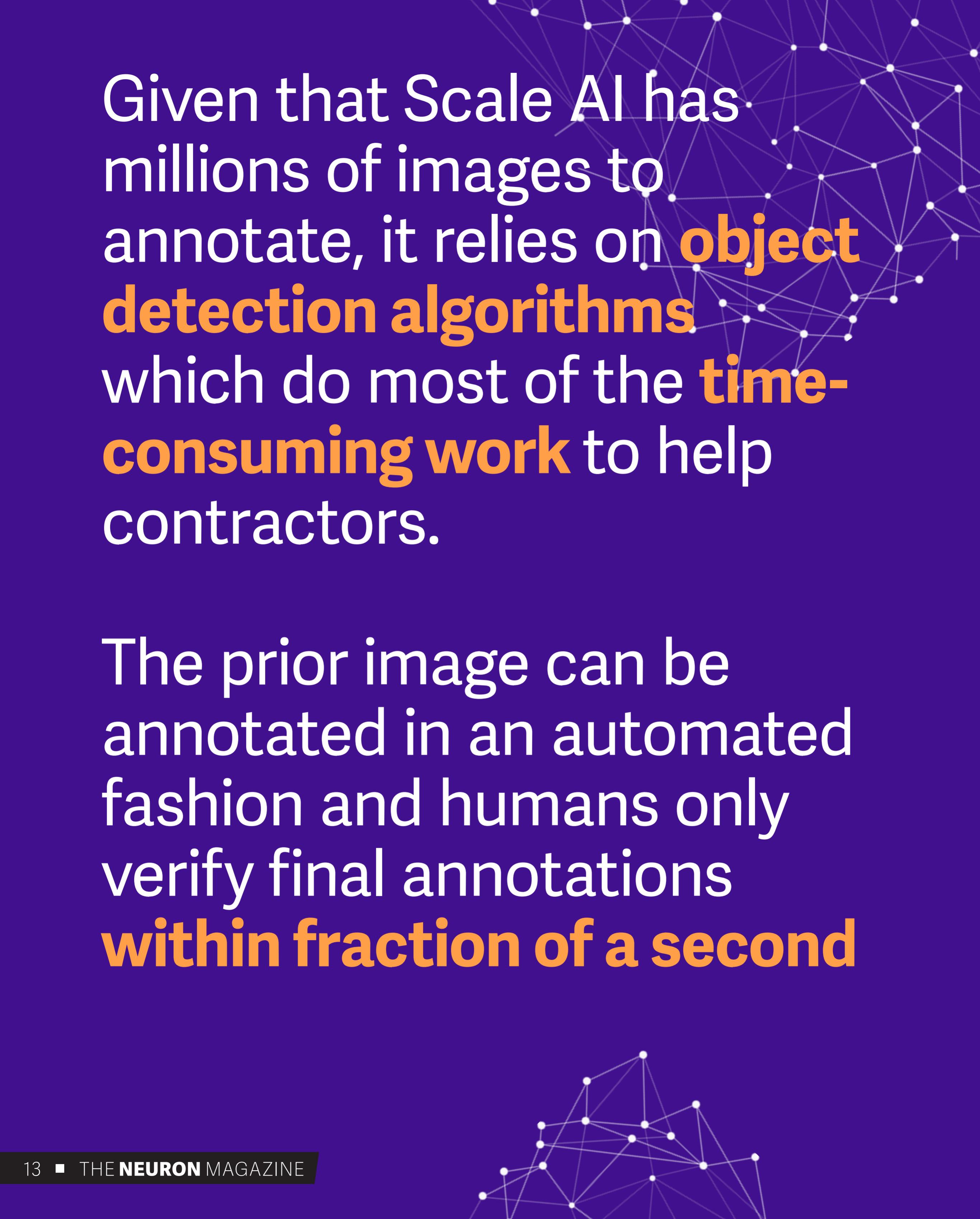


Before Annotation

# Thankfully annotations aren't done manually else it would take forever



After Annotation

A complex network graph is visible in the background, consisting of numerous small white dots connected by thin white lines, creating a mesh-like pattern.

Given that Scale AI has millions of images to annotate, it relies on **object detection algorithms** which do most of the **time-consuming work** to help contractors.

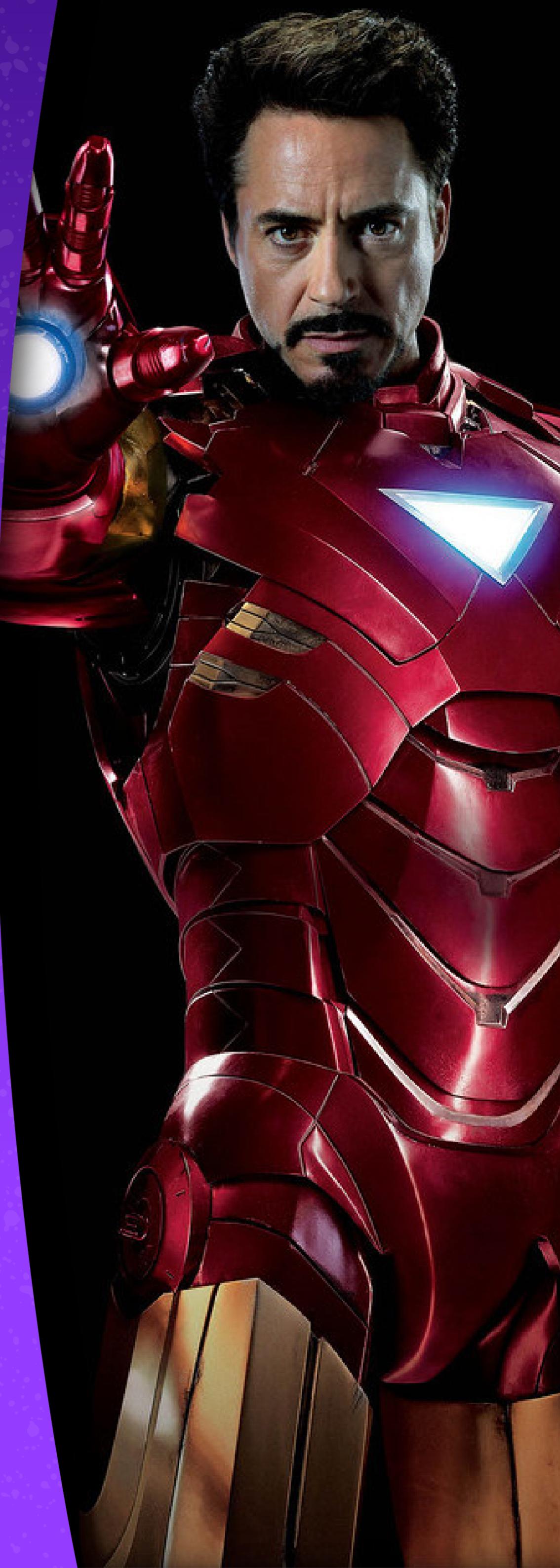
The prior image can be annotated in an automated fashion and humans only verify final annotations **within fraction of a second**

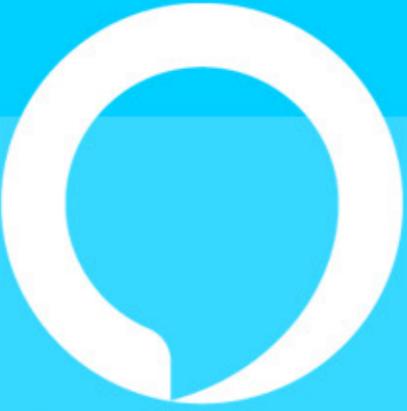
# Humans + Machine = Super Human Accuracy

"Our tasks are annotated by trained and qualified workers with additional layers of both human, data, and machine learning driven quality-control checks.

The resulting accuracy is consistently much higher than what a human or synthetic labeling approach can achieve independently, as measured against rigorous quality areas for each annotation"

– Scale AI website



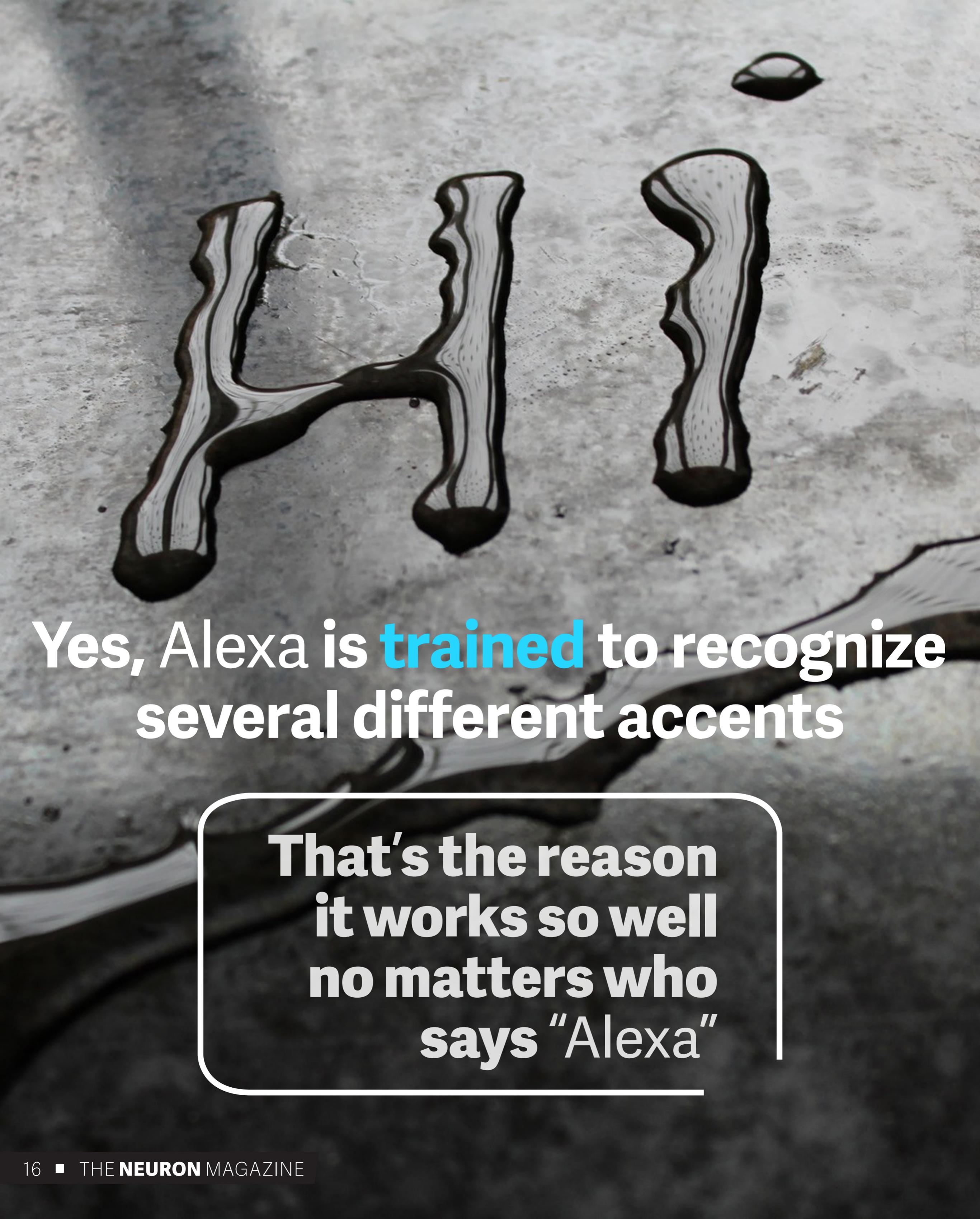


# alexa

**BRAINTEASER:**  
**Does Alexa**  
**use humans to**  
**label data?**

A close-up photograph of an Amazon Echo smart speaker. The device is black with a silver base and a blue light ring around its top edge. The word "amazon" is printed in lowercase on the front face.

amazon

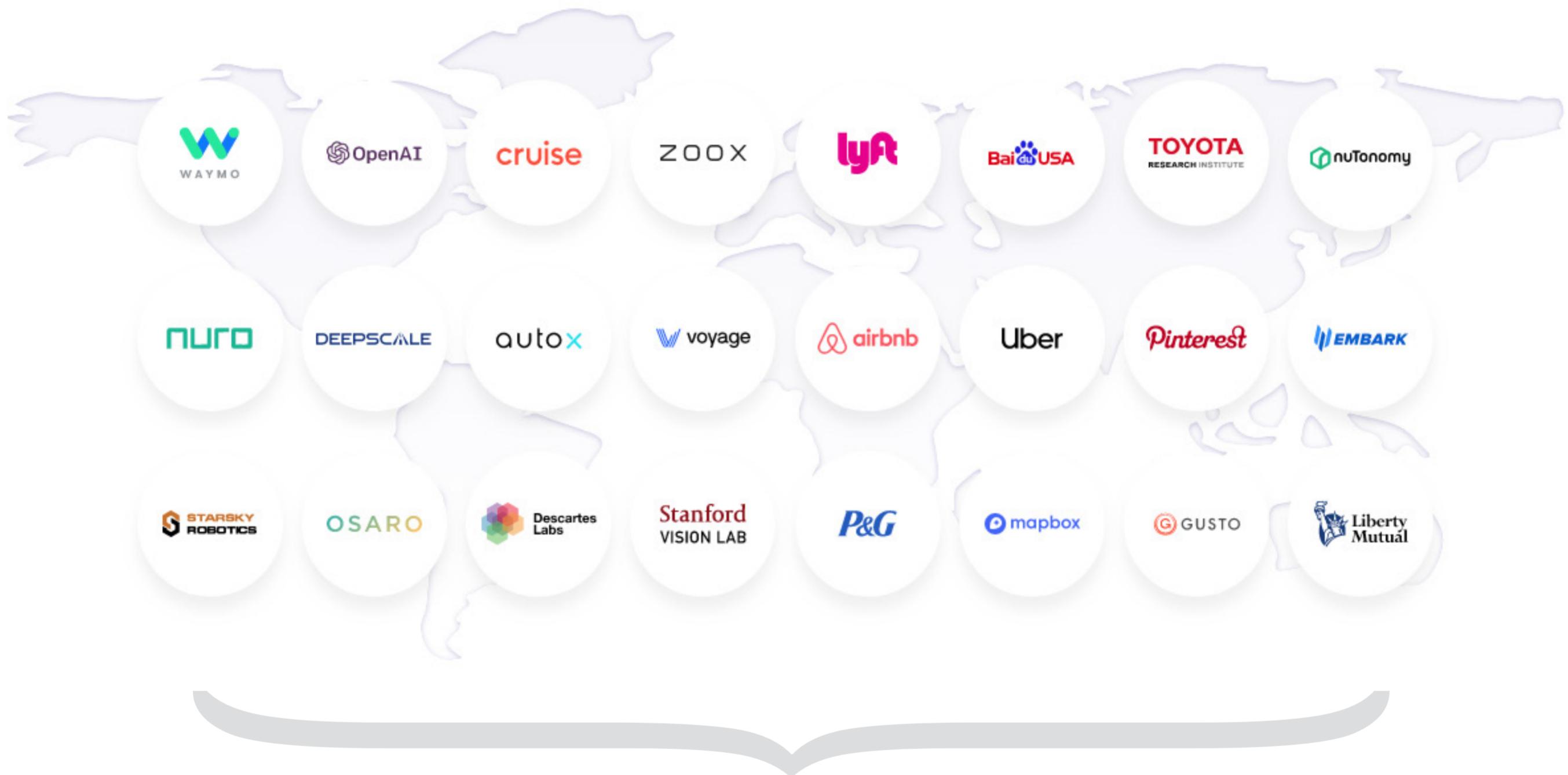


**Yes, Alexa is **trained** to recognize  
several different accents**

**That's the reason  
it works so well  
no matters who  
says "Alexa"**

# Here are some of Scale AI's Customers

Uber, Waymo, Airbnb,  
Pinterest, P&G, Lyft, OpenAI



# scale

# Scale AI has developed **trust** within its customer base

“Scale AI gives tremendous advantage in the automated driving space. Scale AI really enables us to get large amounts of label data to develop and evaluate our deep learning algorithms”



- *Adrein Gaidon  
Machine Learning Lead, Toyota Research Institute*

“Scale is basically providing the ground truth for our perception systems. It’s a very, very critical piece for us to develop”



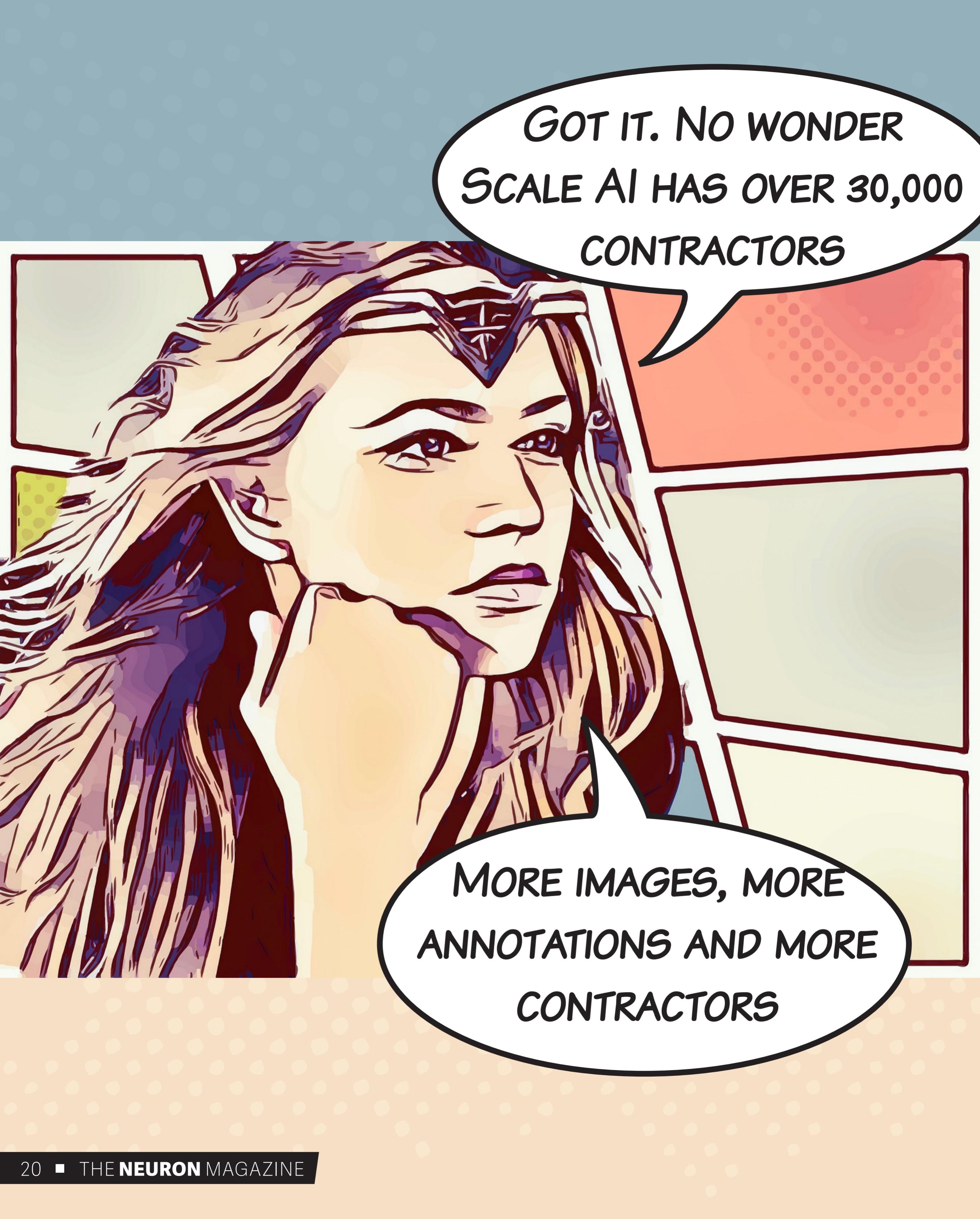
- *Anantha Kancherla  
Head of Self Driving Software, Lyft*

# What do investors think of **Scale AI**'s Business Model?

"AI companies will come and go as they compete to find the most effective applications of machine learning. Scale AI will last over time because it provides core infrastructure to the most important players in the space"

*Peter Thiel - Partner of Founders Fund,  
Early Facebook investor and Billionaire*





GOT IT. NO WONDER  
SCALE AI HAS OVER 30,000  
CONTRACTORS

MORE IMAGES, MORE  
ANNOTATIONS AND MORE  
CONTRACTORS



Ankur Dinesh Garg  
Chief of AI – *Sonasoft*

# INSIDE THE MIND OF ARTIFICIAL INTELLIGENCE STARTUP FOUNDER

# Why I decided to start an AI venture

After exiting my prior eCommerce venture in 2013, I wanted to pursue something that would be at an intersection of:

1. Emerging technology
2. Product-centric
3. Lean without any operational need
4. B2B
5. Sunrise sectors with billions of dollars of opportunity

After due diligence, **the answer was clearly AI.**



Ankur Dinesh Garg  
Chief of AI – *Sonasoft*

# Started an AI-based news service but Indian market wasn't ready for that 5 years ago

With a 7-member team, I developed an AI News Service, which had an AI editor, AI reporter, AI curator, and AI reader.

While our product was effective, people weren't as educated about AI then. They compared us to a news App and focused on the "most downloaded", etc., metrics. They weren't educated to evaluate AI potential in the news.



Ankur Dinesh Garg  
Chief of AI – *Sonasoft*

# Origins of



# HOTIFY

We used our technological capabilities to develop a successful **middleware AI technology** that allows enterprises to quickly build their own AI.

To understand pain points for enterprises, we performed consulting in the beginning, which allowed us to evaluate **AI opportunities** across various sectors.



Ankur Dinesh Garg  
Chief of AI – *Sonasoft*

# Importance of Markets

**We realized our target market is the US. I visited the US for 4 weeks and met over 120 people from various companies such as eBay, Walmart, etc. That clarified our thinking and secured funding, which eventually led us to build Hotify.**



Ankur Dinesh Garg  
Chief of AI – *Sonasoft*

# What guidance would you provide anyone wanting to start an AI company?

- 1. Focus on reality** – in AI, it's very easy to get lost in technology and lose focus of the problem you're solving.
- 2. 10x Value** – to be successful, the value you're creating should be at least 10x.
- 3. Research vs. Application** – be very intentional and clear on whether you're doing AI research or developing an application. With AI research, in many ways, you'll be competing with Facebook and Google.



Ankur Dinesh Garg  
Chief of AI – *Sonasoft*

# Common mistakes companies make with new AI teams

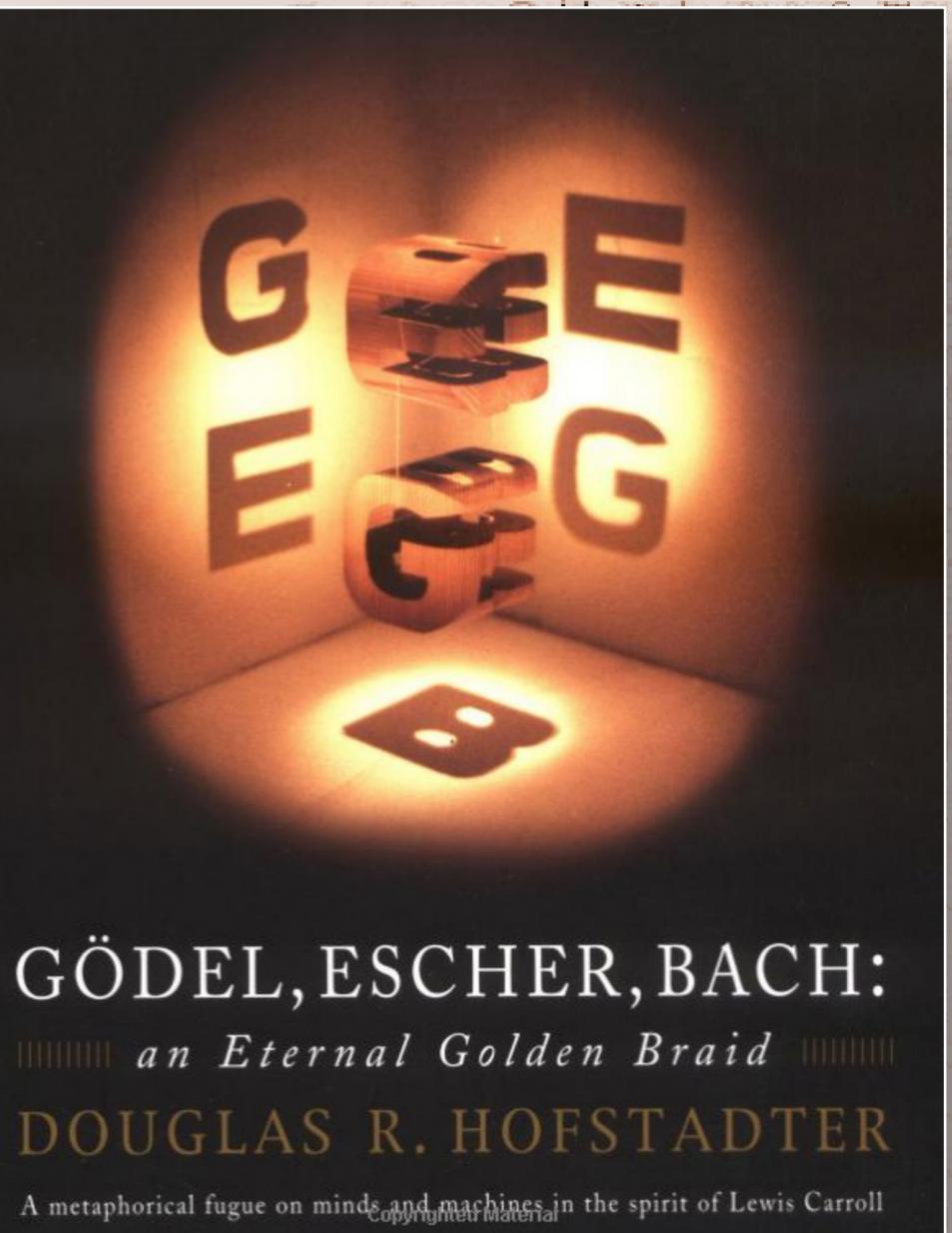
1. Deflect to research and building cool technology gigs but **lose focus on real-life problems**
2. Solving problems using their domain expertise but **failing to build a machine that can solve problems**



Ankur Dinesh Garg  
Chief of AI – *Sonasoft*

# Favorite Book

**Gödel Escher Bach – An interesting journey through mathematics, patterns, logic, and intelligence woven through the work of a mathematician, an artist, and a musician written by a professor of cognitive science. It challenges your perception, raises questions, and develops new perspectives. Above all it is about Gödel Escher Bach**



**Note – Ankur Dinesh Garg is active on LinkedIn and welcomes anyone trying to reach him**



Ankur Dinesh Garg  
Chief of AI – Sonasoft

# AI FOR FOOD

BLUE RIVER TECHNOLOGY



# \$25 Billion

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spent **each year** on  
herbicide (aka weedkillers)  
**to control unwanted**  
**weeds.**



# Over time, weeds can become resistant to herbicide

**What would happen if you overused antibiotics?**

Over time, the bacteria change in response to use of these medications. Antibiotics may not work at all. Same thing is true for weeds.



# 600% increase in herbicide cost!

Herbicide expense for cotton in some regions is forcing farmers to shift away from growing cotton.

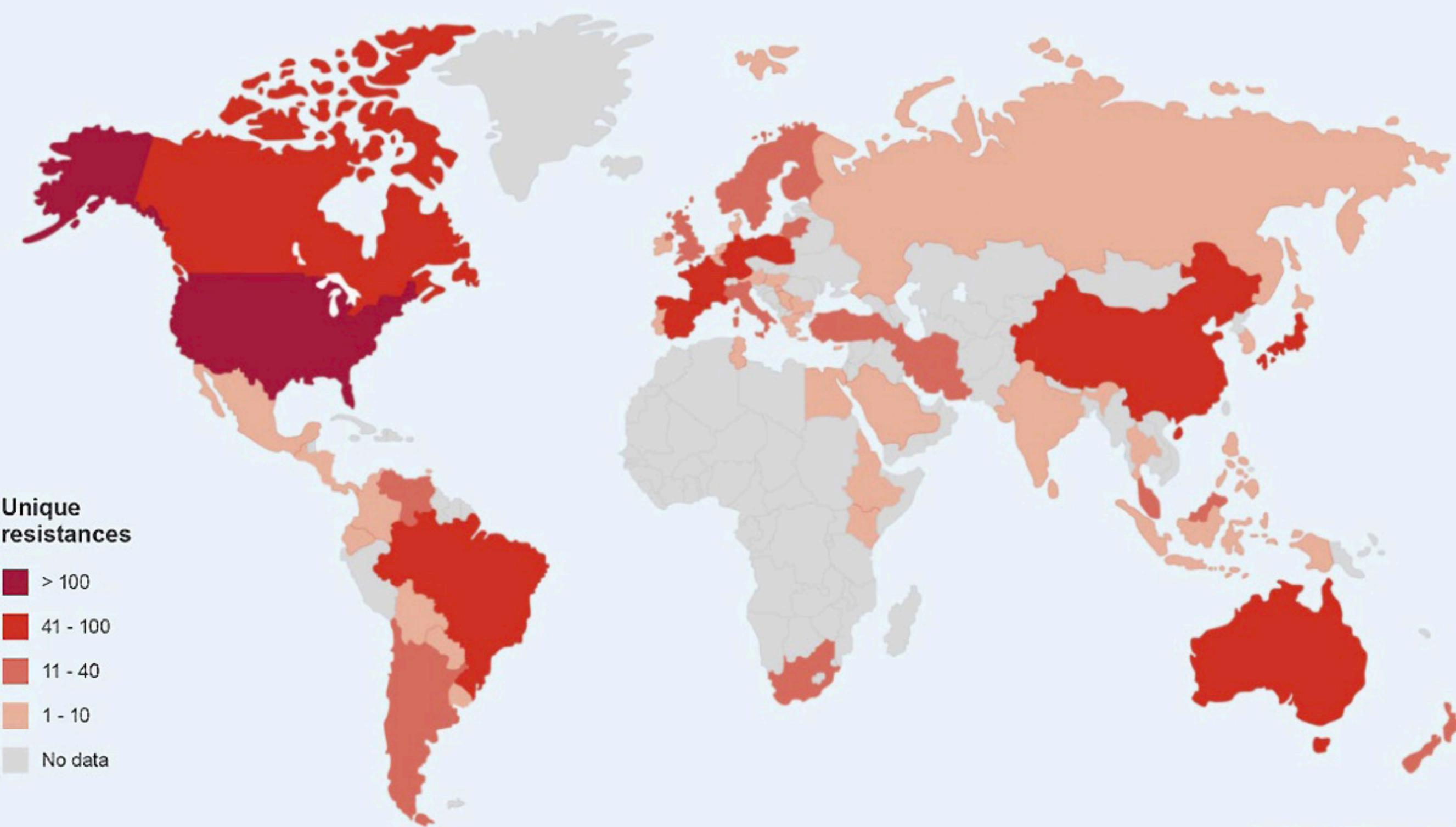
- a) Before : \$50/hectare
- b) 2013 onwards : \$370/hectare



# The danger to our food is REAL

164 weeds  
in the US are  
resistant.

Herbicide resistance: worldwide problems



Source: weedscience.org

# AI can significantly reduce herbicide usage

**Blue River technology** has pioneered usage of computer vision and machine learning to reduce herbicide usage by over 90%.



# Idea is to treat every plant differently



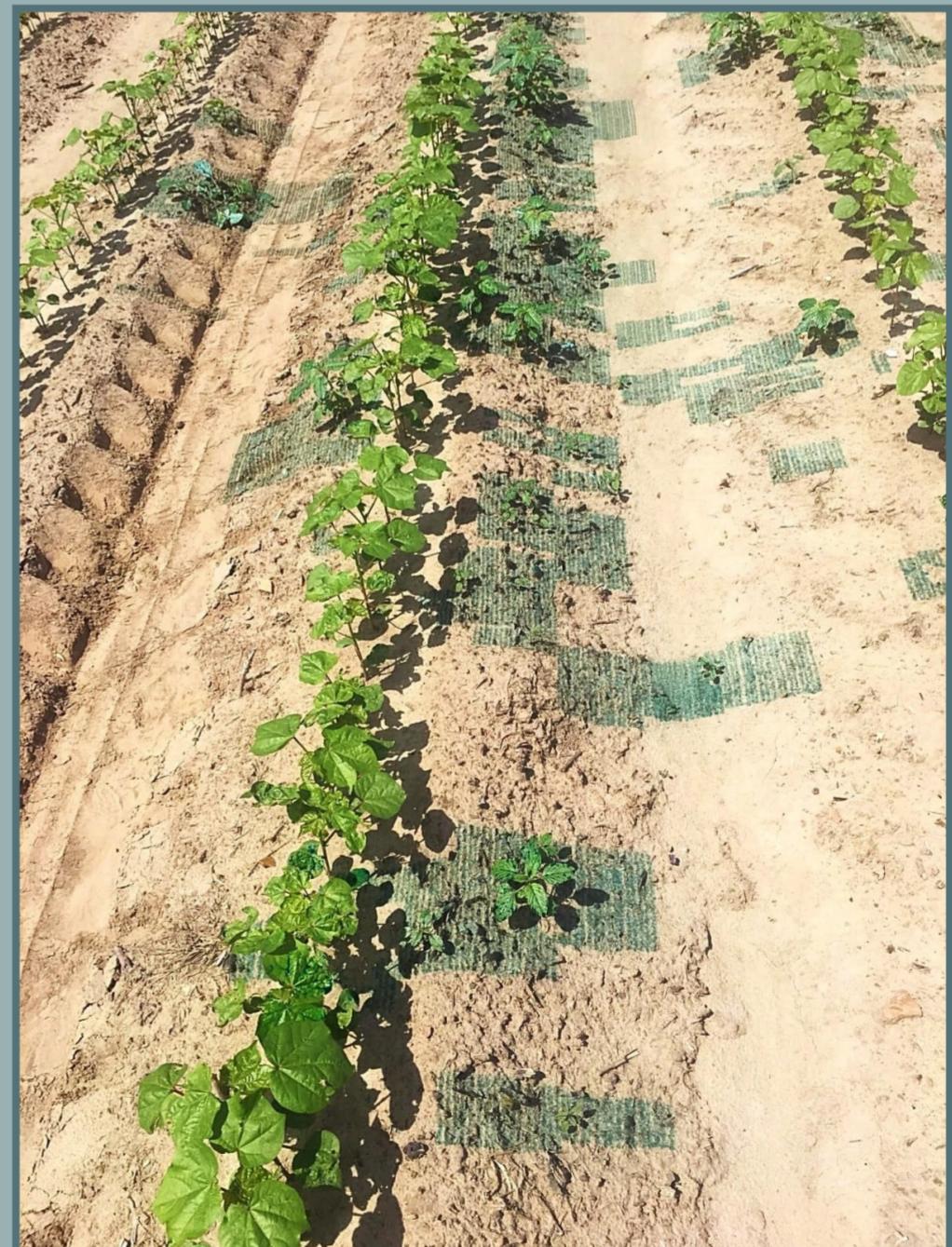
**Traditional Farming**  
– Spray 100% of field

**Artificial Intelligence Approach**  
– Spray only on weeds (red boxes)

# How does it work?

Similar to how Facebook uses Artificial Intelligence to tag your pictures, **Blue River Technology** can tag “healthy crops” from “weeds”.

Its algorithm **uses millions of images to get smarter**



Each of the white boxes has cameras, computers, and sprays attached. The camera takes images, sends to algorithm, and algorithm sends signal to the herbicide spray when it recognizes a weed



*This equipment is branded as See and Spray. It moves at 6 Mph (10 Kph)*

# Dream Team = AI/ML Experts + Mechanical Engineers + Agriculture Scientists

**Blue River Technology** employees have diverse commercial and academic experience.



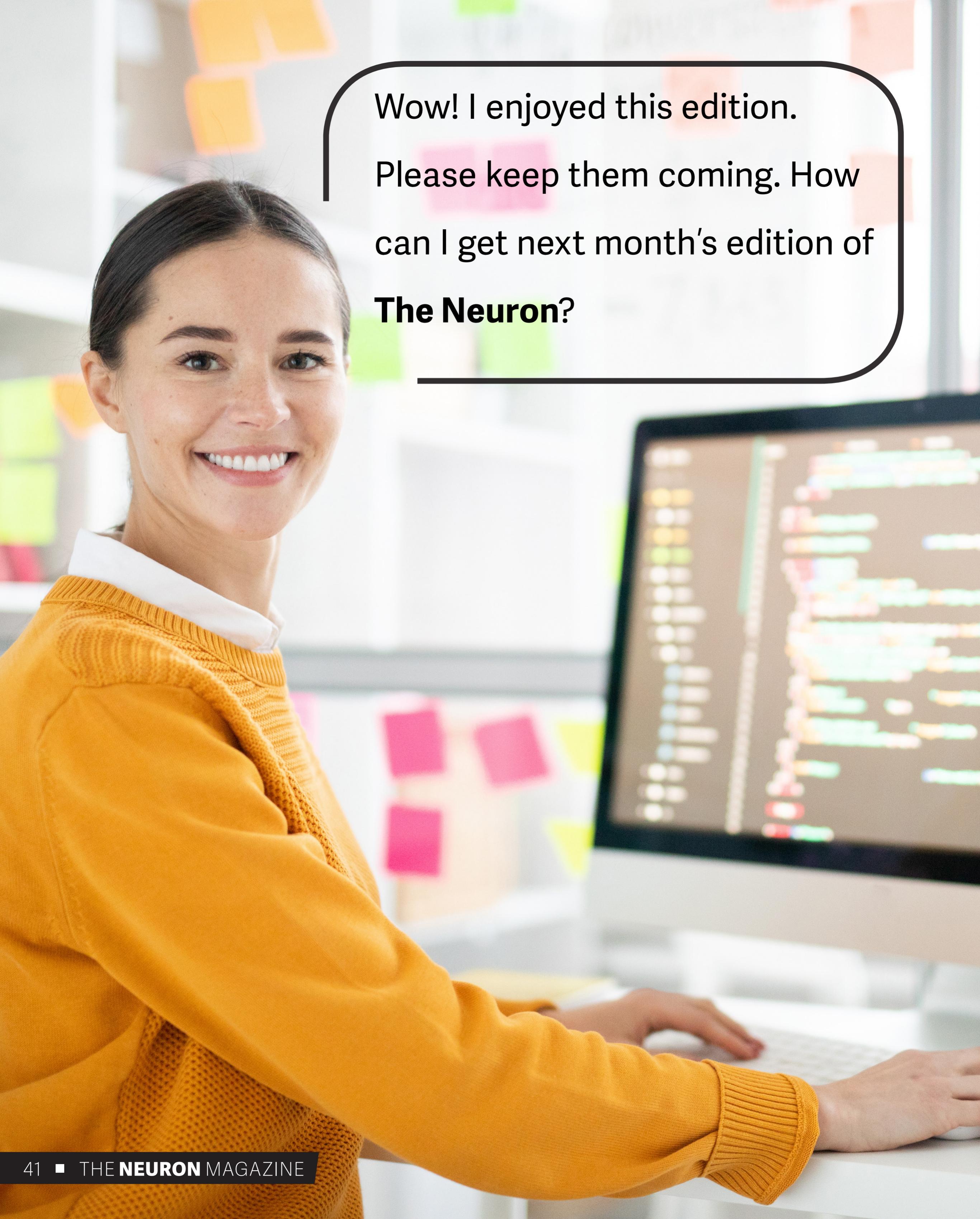
1 out of 10 lettuce in the US are treated by **Blue River Technology**. Remind yourself of this fact the next time you eat a salad.

**Fun Fact – Blue River Technology was acquired by Deere for \$305 million**



**OMG.** I've never been to farm in my entire life  
and yet I understand how AI is helping our farmers.



A woman with dark hair tied back, wearing a yellow ribbed sweater over a white collared shirt, is smiling at the camera. She is positioned in front of a computer monitor displaying a dark-themed interface with various colored bars and text. Behind her is a wall covered in numerous colorful sticky notes of different colors (yellow, pink, green, blue) arranged in a grid pattern.

Wow! I enjoyed this edition.  
Please keep them coming. How  
can I get next month's edition of  
**The Neuron?**

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For Next Edition

## eources

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[bluerivertechnology.com](http://bluerivertechnology.com)  
[youtube.com/watch?v=gszOT6NQbF8](https://youtube.com/watch?v=gszOT6NQbF8)  
[en.wikipedia.org/wiki/Herbicide](https://en.wikipedia.org/wiki/Herbicide)  
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