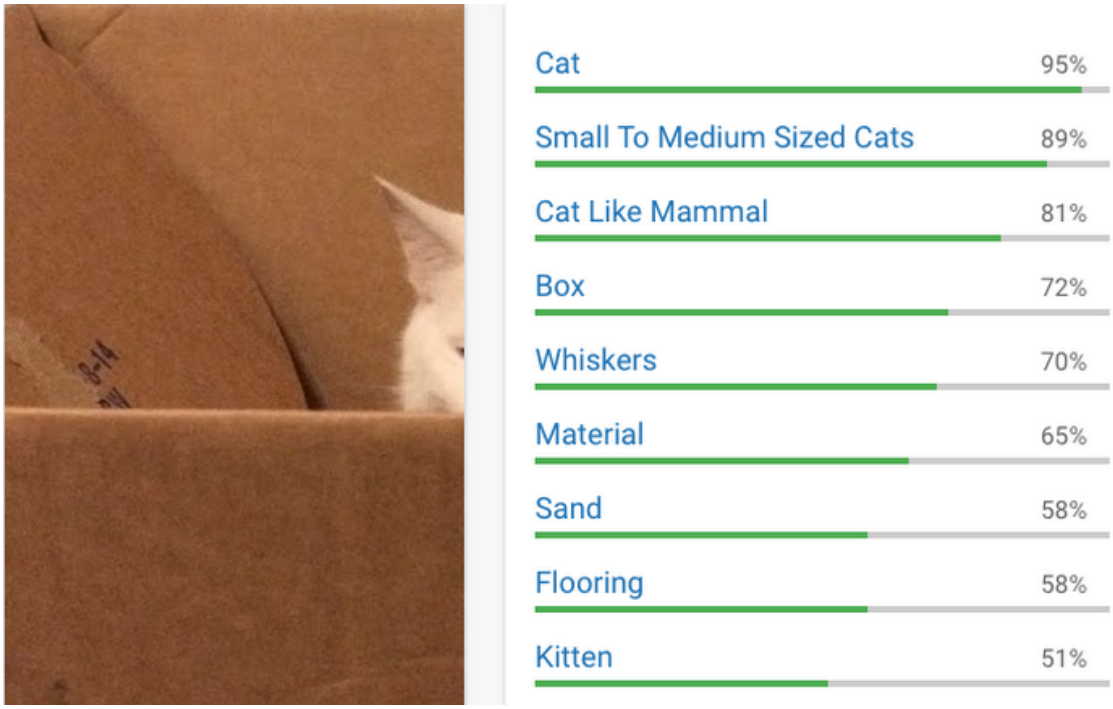
AI & MACHINE LEARNING

On cats, TPUs, and pushing the boundaries of our imagination

Adrian Otto

You know where I'm going with this. Today, anyone who's ever used Google Photos knows that not only can a computer recognize an image of a cat, it can even recognize a fragment of an image of a cat. An image that you or I would identify as a cat with only 60 or 70% confidence, the Google Cloud Vision API can identify with 95% confidence in milliseconds. It knows this because of the stunning progress we've made in artificial intelligence (AI), image recognition and computational efficiency. Together, these advances have enabled neural networks that can be efficiently trained against literally millions of pictures of cats.



The Cloud Vision API is 95% confident that this is an image of a cat.

working list of more than seven items in our minds, and our performance decreases dramatically. This is why AT&T Bell Labs chose seven-digits as the length of a phone number. This is also why people use Google Calendar rather than try to remember numerous appointments in their head.

With AI on the other hand, computers can juggle—and make sense of—astounding amounts of data. We've seen how AI can do fun things like play a game (DeepBlue, AlphaGo). Now, imagine applying AI to business problems like diagnosing disease, reducing traffic or train accidents, or maximizing investment yields. In my work with the Google Cloud Office of the CTO, I talk to lots of enterprises in banking, high tech, and retail. Everyone has a problem—a finite resource—that they would like to optimize for or gain insight into. Perhaps it's reams of unstructured data from which they'd like to extract customer sentiment, or satellite imagery that they'd like to use to estimate global oil supplies. Those insights that you uncover with AI are all insights that you can use to gain business advantage—and now, with Cloud TPUs, you have the compute power you need to train your AI workloads quickly and cost-effectively.

Imagine for a moment what it would be like to combine the best qualities of humans with the leading strengths of computers. What's possible? Can we cure disease, prevent war, lower traffic congestion, and live happier, healthier lives? I believe those may all be possible when we equip creative and motivated humans with tools and capabilities that push our current limitations. We are at the point now when we've blown past those limits. It's real now.

Of course, it's important to consider the moral and ethical dimensions of any new technology. Here at Google, we've codified these considerations into seven core AI principles against which we weigh any potential new AI application. It's still relatively

predict a movie audience

system to see, understand, and react in the real world (Part III)

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