sentient labs

Can Humans Train Artificial Intelligence Systems to Recognize Photos?

Sentient's deep learning team conducted an experiment to see if AI could find target images on a user's iPhone in place of traditional search methods which can be ineffective.

Using deep learning algorithms to create a game, Sentient set out to prove that humans can train AI models to detect similarity between images.

The Problem

Today, humans need to work within the constructs and infrastructure of software applications that rely on relational databases, making it difficult to find what you are looking for without trial and error, guessing or semantic search. Traditional methods use text, metadata and tags to organize information and images to make them accessible. This traditional method can be problematic, as it can be:

- **Inefficient** - Users cannot always describe what they are looking for or why it is interesting to them
- **Disjointed** - Without understanding a user's intent, results can be completely inaccurate, creating frustration
- **Culturally biased** - Today's systems struggle to handle even the most simple issues of translation, e.g., words and phrases used by English speakers in different parts of the world
- **Cumbersome** - Beyond using search as a method of discovery, other interactions are needed to refine what users want to see

The Goal

Sentient had two goals in this experiment.

First, train Sentient's image similarity algorithms to easily detect image attributes to understand similarity from the end user's perspective without the need of indexed data or text-based search -- with a relatively small number of participants.

Second, was to test how well the algorithm had trained on the images used in the experiment: It was determined that users should be able to find a target image with the assistance of the AI within 10 taps.

The Solution

Sentient Labs developed a hypothetical game called "Pixstachio." It presented users with an image and they were asked to find it using the assistance of the AI. Without knowing the AI was showing similar photos based on their selections, users would see new sets of images each time they clicked on a photo that was most similar to the target. Eventually, users would see the target image set based on their inputs. (Fig. 1)

Next Steps

Sentient is applying the trained models developed during the Pixstachio user testing

to power visual shopping experiences for some of the largest online apparel retailers in North America.

At a Glance

What Sentient Wanted To Do

· Prove that users can teach Deep Learning algorithms similarities between photos
· Given a target image, users will be able to find that image in a random set, within 7 clicks, using algorithms designed by Sentient
· Understand user behaviors while evaluating images for criteria selection
· Teach Deep Learning AI how to identify attributes in an image to inform and

Figure 1 - Sentient used photos from a user's iPhone to simulate a game where AI assisted in finding a target image.

guide future product development

What Sentient Labs Did

· Developed an iPhone game that asked users to click on images that were most similar to the target image in order to find it in the set. (Fig. 1)
· Conducted user testing with a broad demographic to evaluate performance and accuracy
· Evaluated algorithm performance through both subjective (user sentiment) and objective (number of clicks to target) data
· Leveraged findings to tune and enhance algorithms' image similarity detection

What Sentient Labs Accomplished

· Conducted user testing with 184 participants
· Tuned image similarity algorithm to achieve a median of 7 clicks to target identified, beating target of 10 clicks
· Leveraged insight and feedback to improve image similarity algorithms that will be launched with major retailers for online commerce

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