

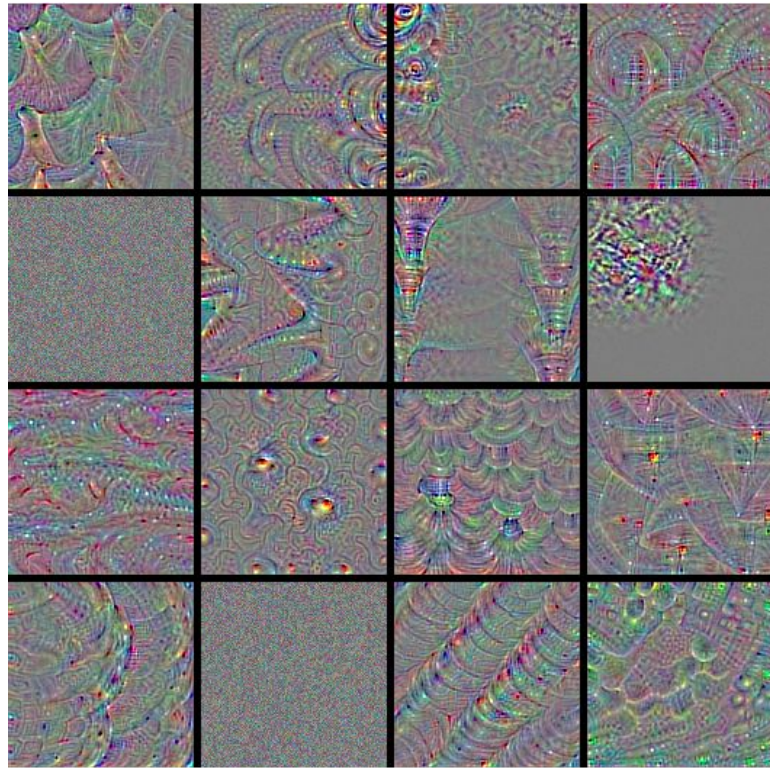
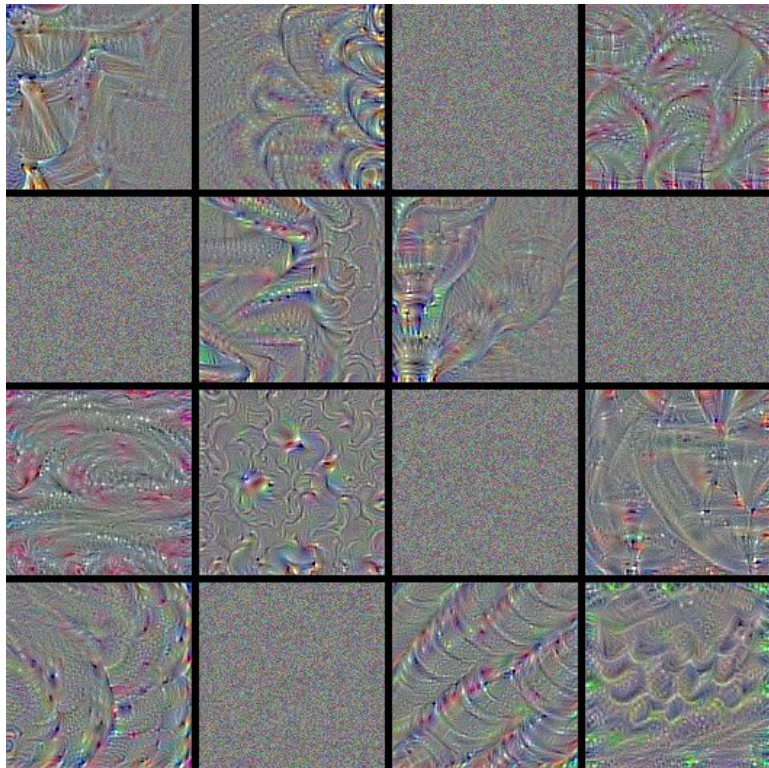
Human Vision and Computer Vision

Sudhakar Mishra

Computer Vision

1. Computer Vision is a branch of Artificial Intelligence which aims to program computers to perceive and understand visual information in the same way that humans can.
2. The Backbone of Computer Vision is Pattern Recognition.

Pattern [4]



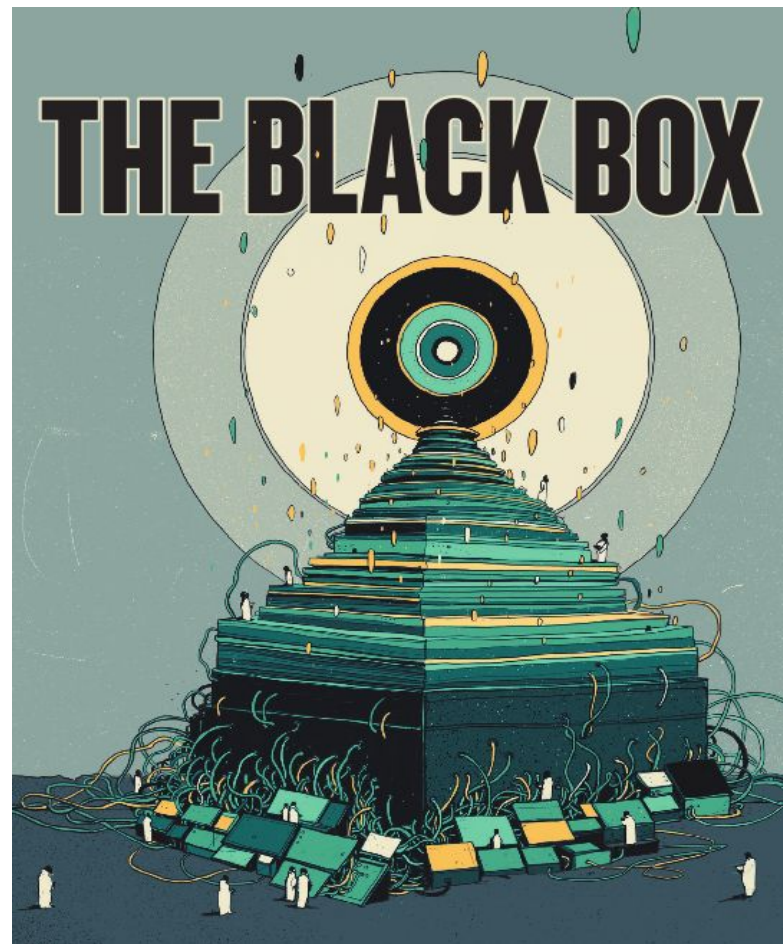
Pattern Understanding is not Enough.....

Deciphering the diffused pattern
information

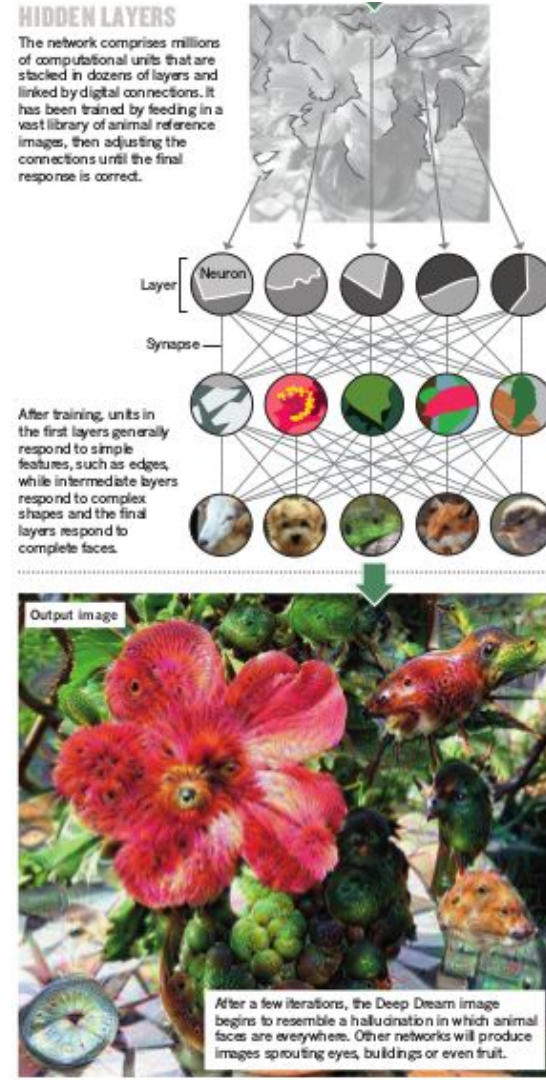
Pattern Understanding is not Enough.....

Deciphering the diffused pattern information

What machine knows is needed to be known.



Deciphering the diffused pattern information



Fooling ----

Machine learning is becoming ubiquitous in basic research as well as in industry. But for scientists to trust it, they first need to understand what the machines are doing.

“The problem is that the knowledge gets baked into the network, rather than into us.”

BY DAVIDE CASTELVECCHI

[2]

[2]

I think I know that face...

[1]

SIR — Exactly what do we recognize in a face? Intuition suggests that it is the eyes, nose and mouth — they, after all, are what the dictionary uses to define a ‘face’. Portraitists labour to get these features right and poets describe the eyes as sure betrayers of identity. Computer scientists, not to be outdone, have designed vision systems that rely on precise measurements or templates of these ‘internal’ features to recognize faces¹. This view often seems justified.

recognition systems might stand to benefit by incorporating, in some measure, the head processing strategy.

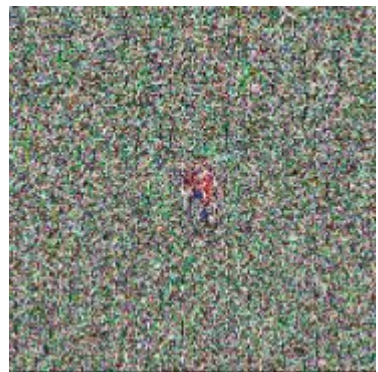
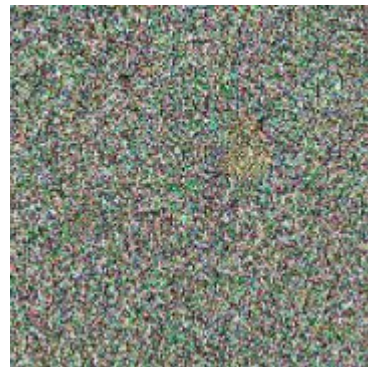
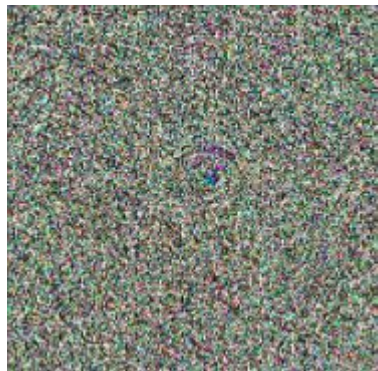
Pawan Sinha

Tomaso Poggio

*E25-201, Department of Brain and Cognitive Sciences,
Massachusetts Institute of Technology,
Cambridge,
Massachusetts 02142, USA*

Chinese ethics

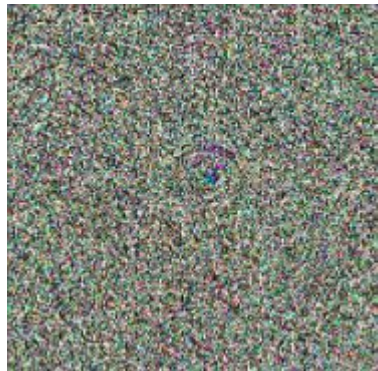
Fooling ----- [3]



Certainly Among These



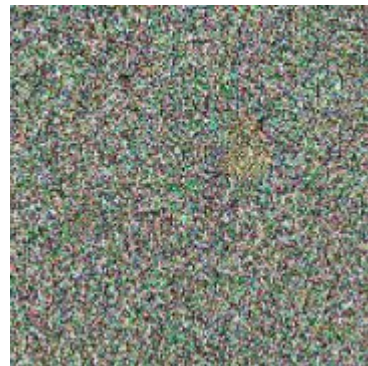
Fooling ----- [3]



Bubble



Cheetah



Jackfruit



Lesser_Panda



Robin

Fooling ----- [3]



BaseBall



Guitar

Difficulty with Intuition And Context

1. “Perception” problems, such as Computer Vision, appear easy to some because it involves replicating what humans do so easily. However, this is precisely what makes it so difficult.
2. Context of the present situation

Human Perception



Human Perception



EXPLORING THE CASE FOR CORPORATE CONTEXT-BASED WATER TARGETS

April 2017



Take Away

Difference between Human and Computer Vision

We use our brain all the time; We trust our brain all the time;
and We have no idea how our brain works.

What is intuitive is least understood to us.

The best way out is to have doubts and questions on your head all the time.

References

1. Sinha, P., & Poggio, T. (1996). I think I know that face. *Nature*, 384(6608), 404-404.
2. Castellevecchi, D. (2016). Can we open the black box of AI?. *Nature News*, 538(7623), 20.
3. Nguyen, A., Yosinski, J., & Clune, J. (2015). Deep neural networks are easily fooled: High confidence predictions for unrecognizable images. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition* (pp. 427-436).
4. "Visualizing CNN Filters with Keras." Jacob's Computer Vision and Machine Learning Blog, 23 Mar. 2016, jacobgil.github.io/deeplearning/filter-visualizations.