

# Deep learning

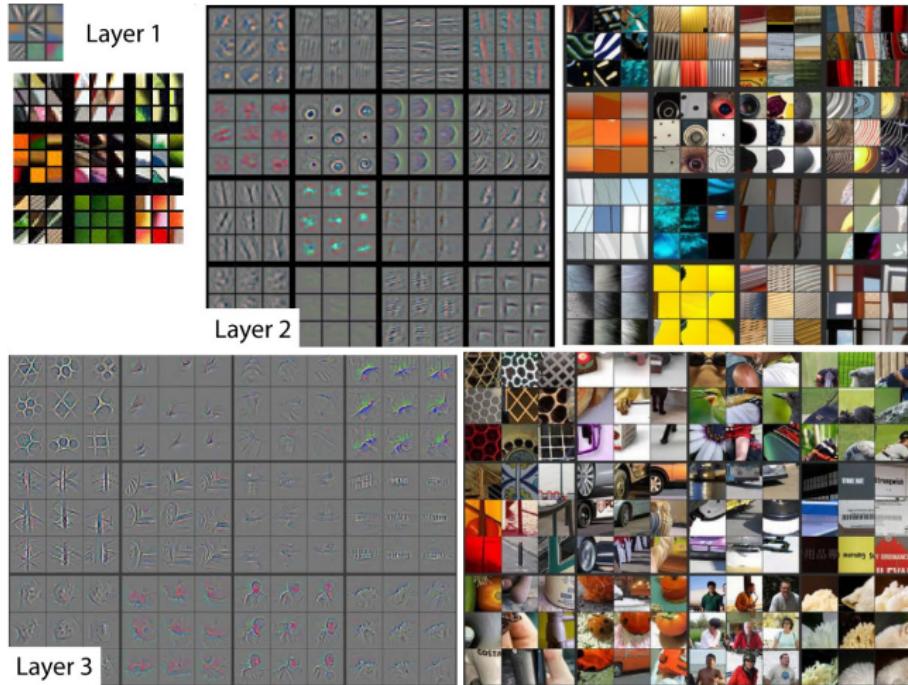
## 1.3. What is really happening?

François Fleuret

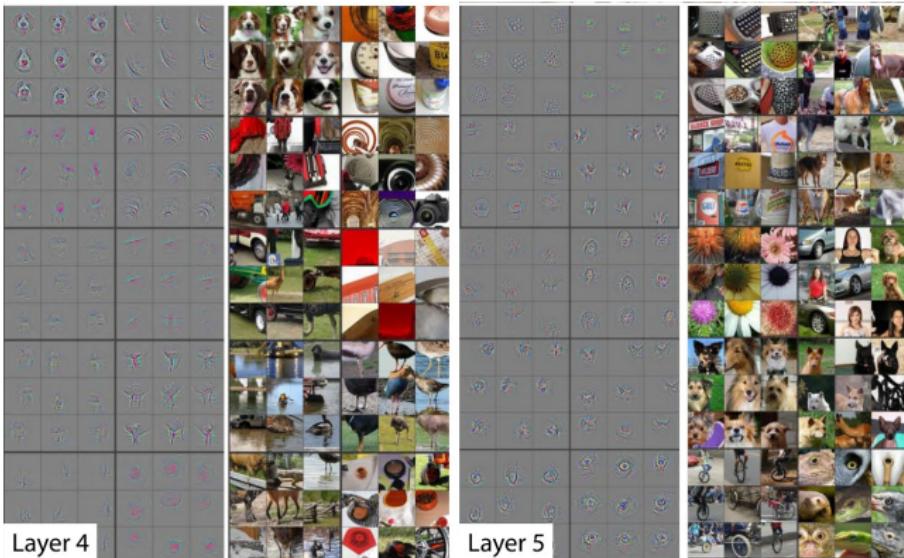
<https://fleuret.org/dlc/>



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DE GENÈVE



(Zeiler and Fergus, 2014)



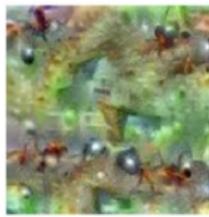
(Zeiler and Fergus, 2014)



Hartebeest



Measuring Cup



Ant



Starfish



Anemone Fish



Banana



Parachute



Screw

(Google's Deep Dreams)



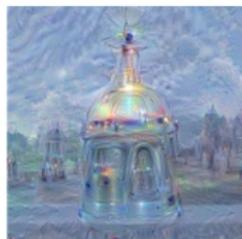
Horizon



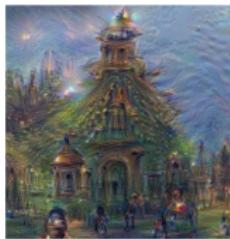
Trees



Leaves



Towers & Pagodas



Buildings



Birds & Insects

(Google's Deep Dreams)

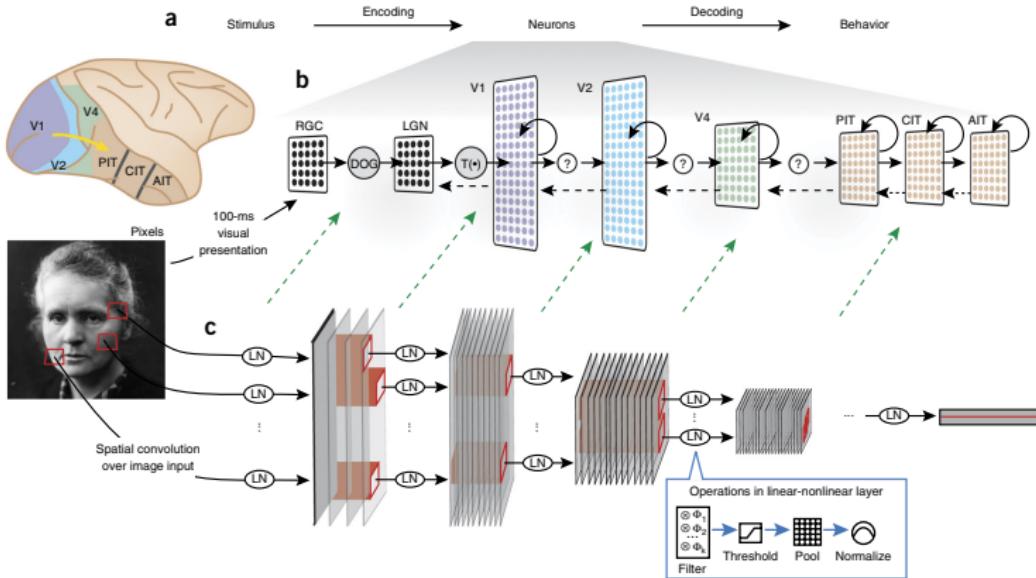


(Thorne Brandt)

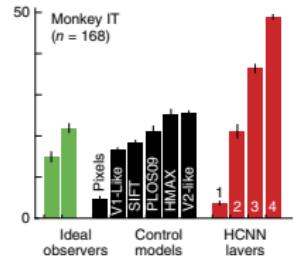
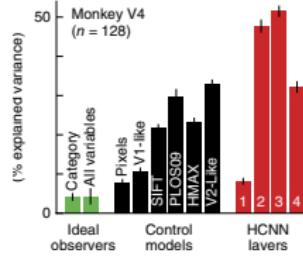
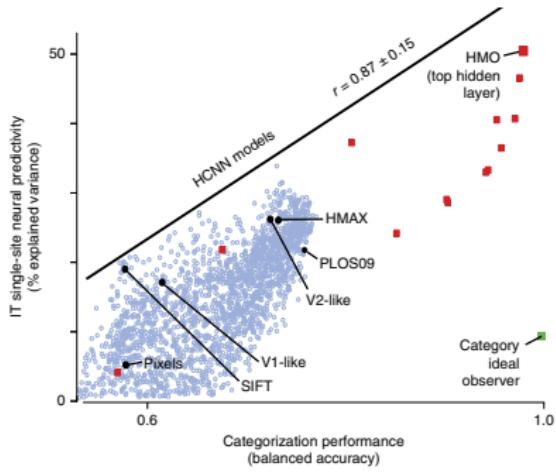


(Szegedy et al., 2014)

## Relations with the biology

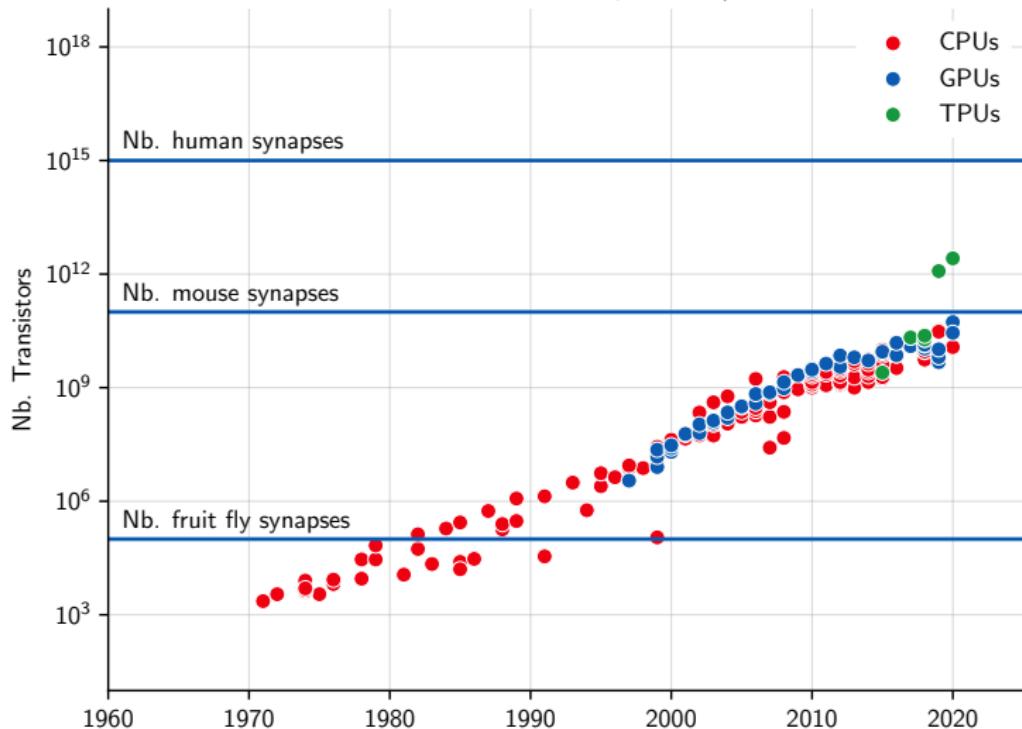


(Yamins and DiCarlo, 2016)



(Yamins and DiCarlo, 2016)

### Number of transistors per CPU/GPU



(Wikipedia “Transistor count”)

The end

## References

- C. Szegedy, W. Zaremba, I. Sutskever, J. Bruna, D. Erhan, I. Goodfellow, and R. Fergus. **Intriguing properties of neural networks**. In International Conference on Learning Representations (ICLR), 2014.
- D. L. K. Yamins and J. J. DiCarlo. **Using goal-driven deep learning models to understand sensory cortex**. Nature neuroscience, 19:356–65, Feb 2016.
- M. D. Zeiler and R. Fergus. **Visualizing and understanding convolutional networks**. In European Conference on Computer Vision (ECCV), 2014.