

## Deep learning

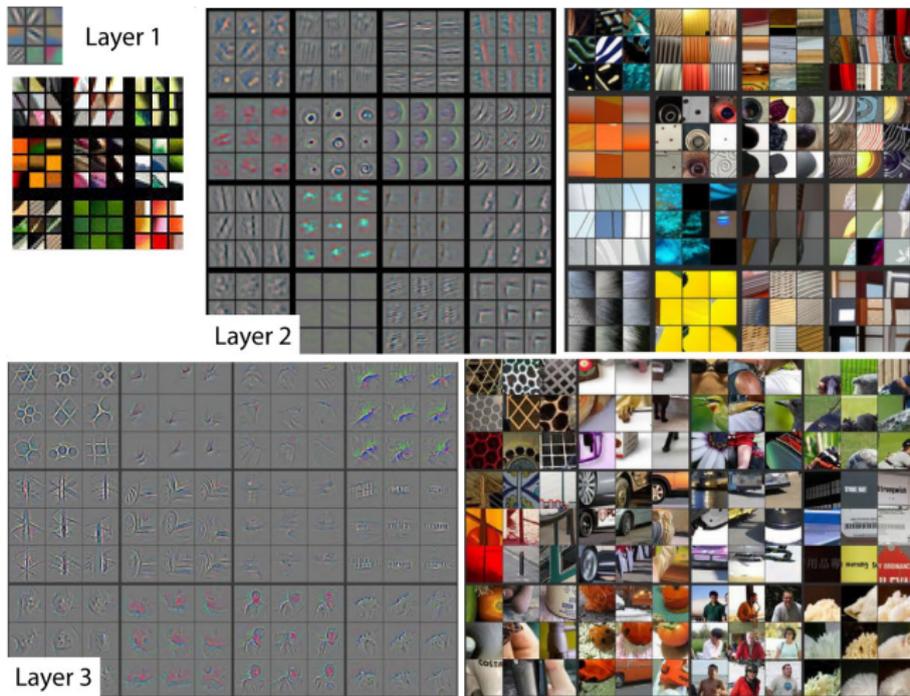
### 1.3. What is really happening?

François Fleuret

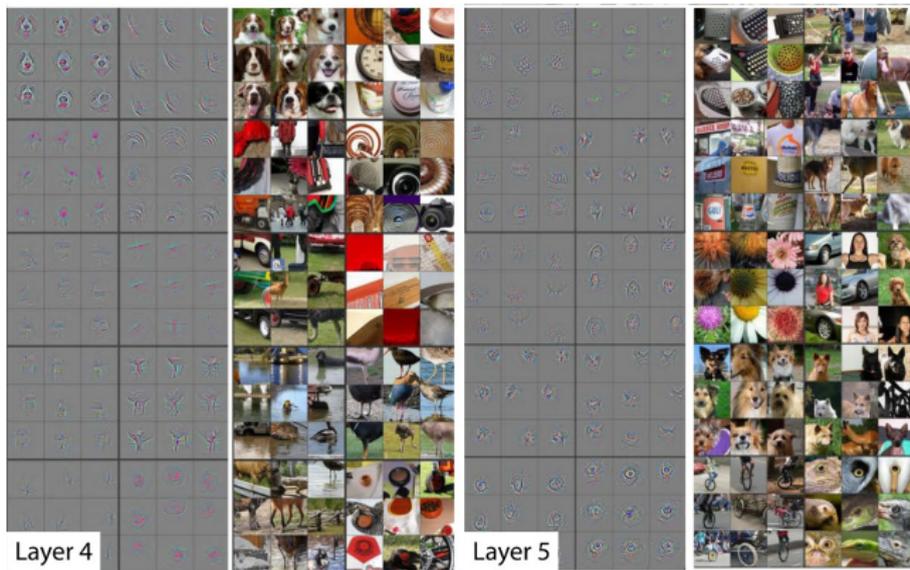
<https://fleuret.org/dlc/>



**UNIVERSITÉ  
DE GENÈVE**



(Zeiler and Fergus, 2014)



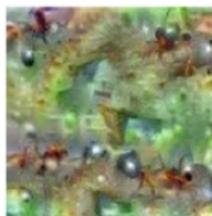
(Zeiler and Fergus, 2014)



Hartebeest



Measuring Cup



Ant



Starfish



Anemone Fish



Banana



Parachute

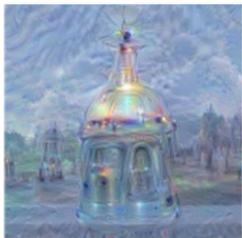


Screw

(Google's Deep Dreams)



Horizon



Towers & Pagodas



Trees



Buildings



Leaves

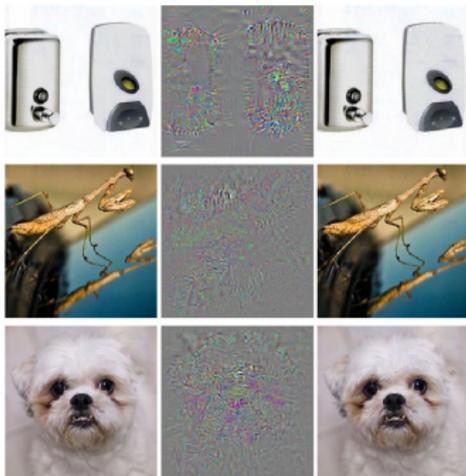
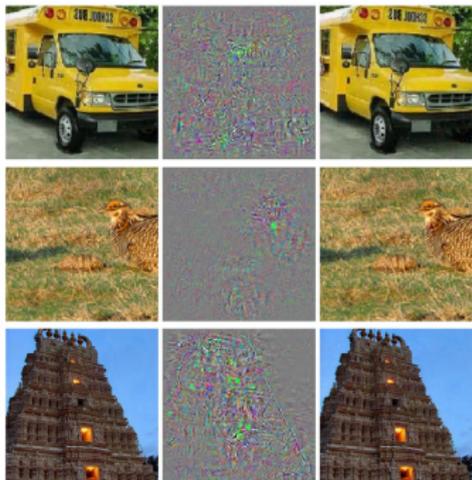


Birds & Insects

(Google's Deep Dreams)

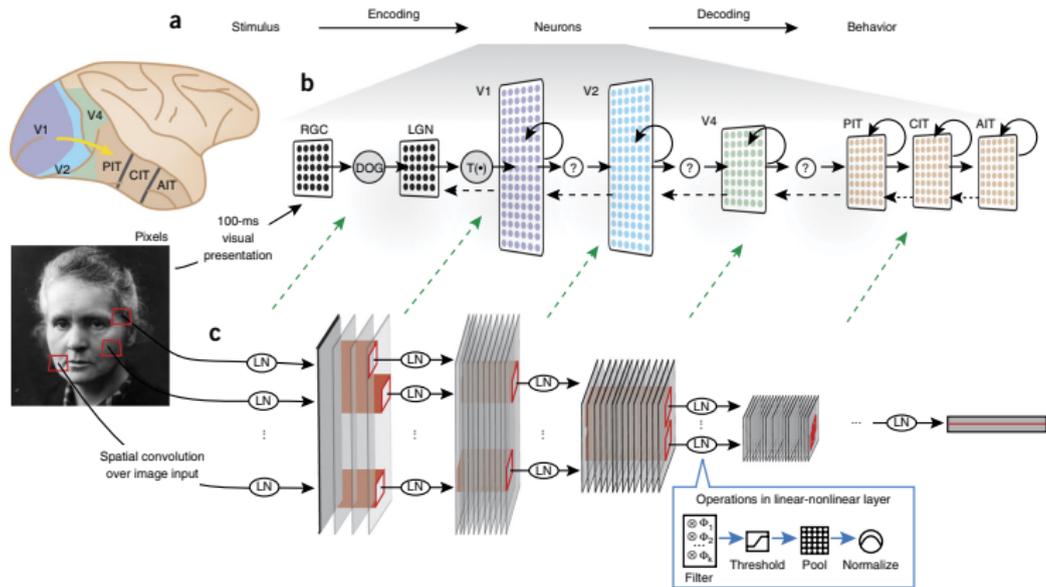


(Thorne Brandt)

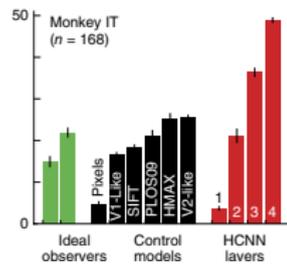
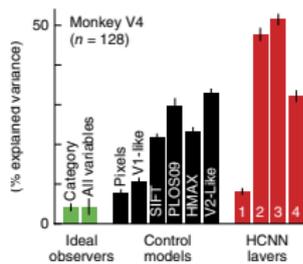
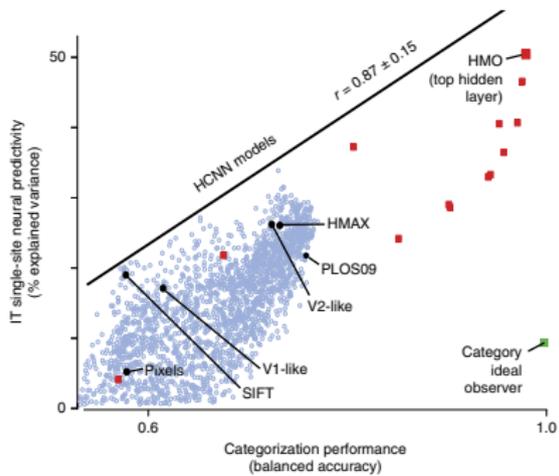


(Szegedy et al., 2014)

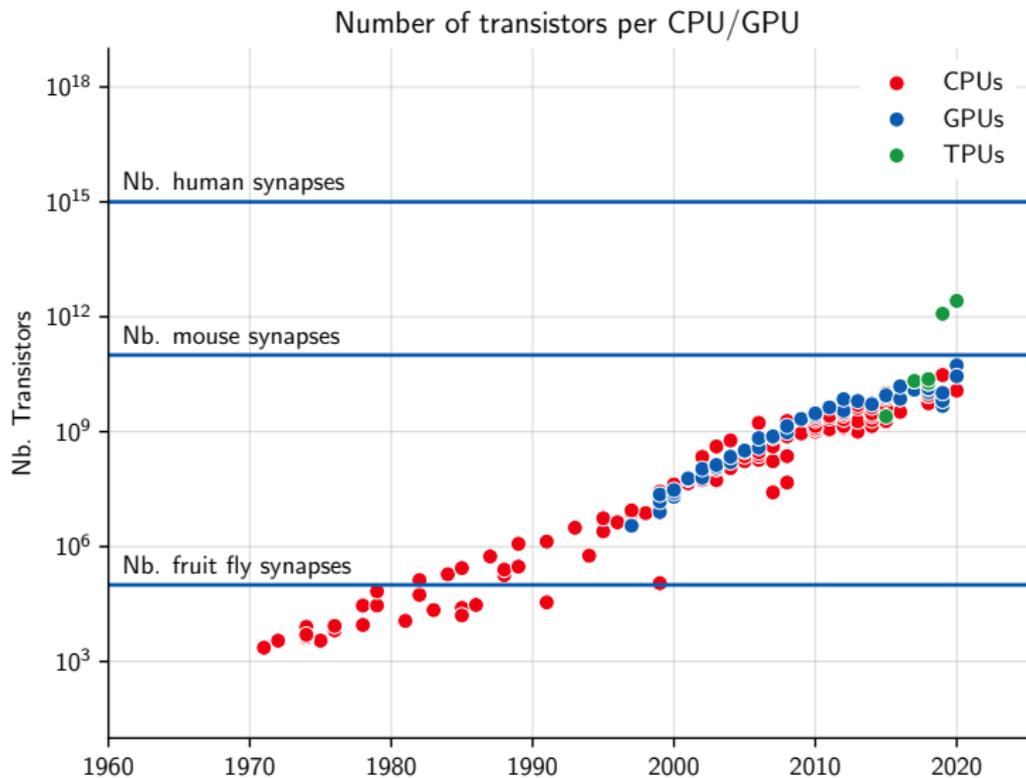
## Relations with the biology



(Yamins and DiCarlo, 2016)



(Yamins and DiCarlo, 2016)



(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.