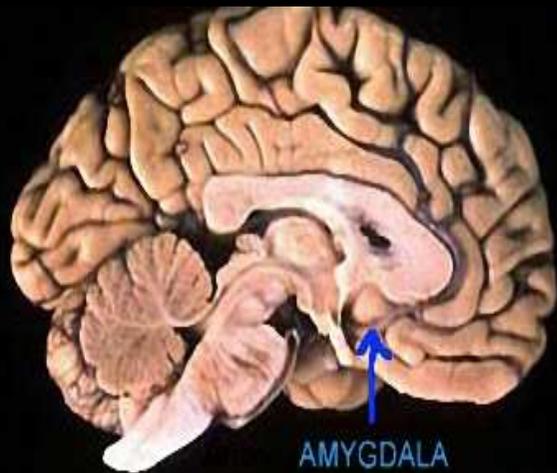


Why do we (and robots) need the amygdala?



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Definitively not as a fast threat detector

**Visual responses of amygdala
cells are too late for that.**

We don't make sense of what we see without amygdala "even if we are not blind"

- Amygdala lesions in humans lead to impairments in interpreting others emotional expressions (fear). More global social cognition impairments are seen in autism, schizophrenia and posttraumatic disorders. All these pathologies are accompanied by structural changes in the amygdala.
- Extended lesions produce deficits in object recognition (Kliver-Bucy)
- All these deficits might be due to "incorrect looking". Patients do not spontaneously look to the eyes and when they are reminded to do so, they recognize the facial expression

To interpret correctly we need to look correctly

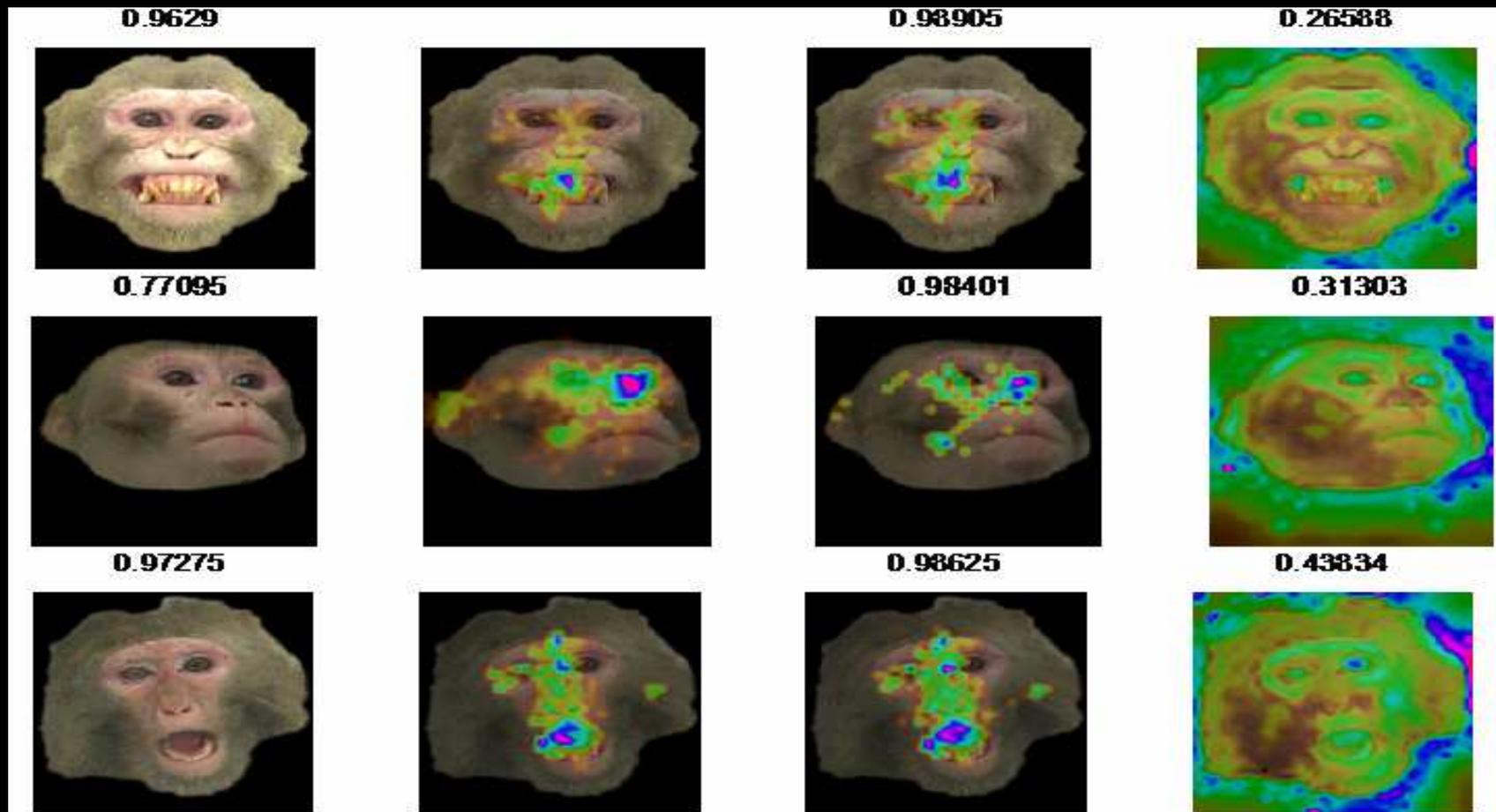
Autistic Group



Control Group



Primates look at faces according to stored knowledge rather than perceptual saliency. Firing of amygdala cells help determining where and for how long to look at faces.



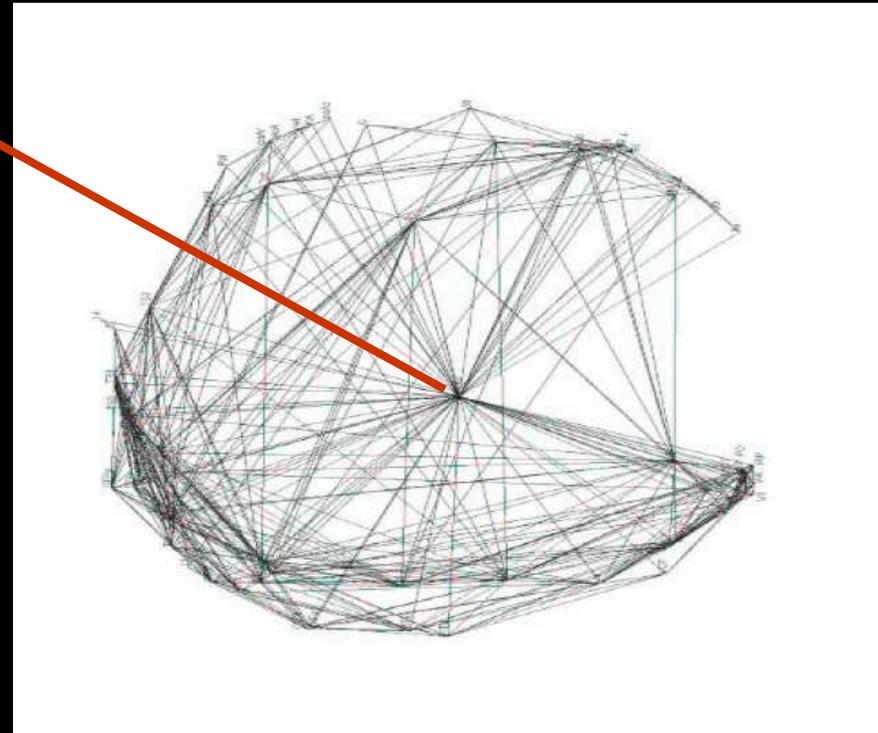
Amygdala contains eye fixation cells

~~most densely connected~~ structure in the primates brain

Amygdala

A connection of nuclei with many diverse roles: visual motor, auditory, somatic, reward, task related, attention, etc

**A little brain within
the brain**



We need the amygdala (Hypothesis):

- To link current goals (internally driven), experience (stored knowledge, internally driven), perceptual saliency (stimuli driven) with appropriate actions.
- As an interface between perception, cognition and action
- Robots might need the amygdala to learn “habits”, i.e., to create associations between stimuli