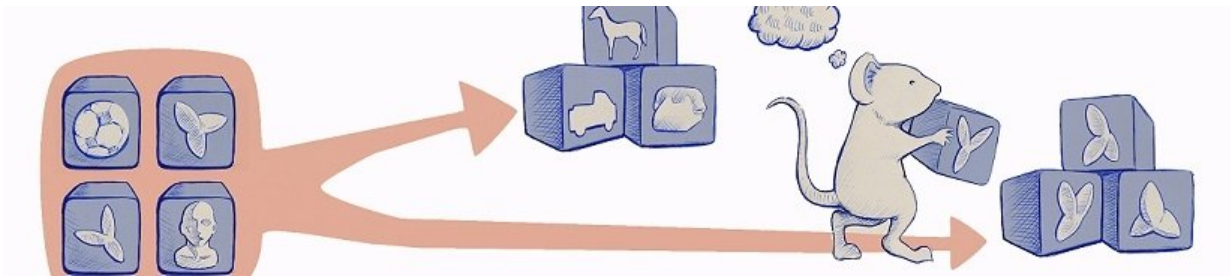


Studying the visual recognition abilities of rodents

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Credit: International School of Advanced Studies (SISSA)

The visual process that allows humans to recognize the gender or emotional state of another person is very sophisticated. Until recently, only primates were believed able to perform such complex operations as object recognition. A new study published in the journal *Current Biology* shows that rodents also use advanced and diversified object recognition strategies. These results confirm the validity of this animal model for the study of object vision and offer new opportunities for the development of artificial vision systems and diagnostic approaches.

The identification of an object, a person or its [emotional state](#) comprises fundamental cognitive processes that occur in just a few tens of milliseconds. Underlying such processes is the ability to extract from the retinal image the specific features of an object or a face and their spatial relationships.

The new research, conducted in the visual neuroscience laboratory directed by Davide Zoccolan, has demonstrated the existence of similar object [recognition](#) strategies in rodents. Through a behavioural study, Vladimir Djurdjevic and co-authors investigated the ability of rats to discriminate a reference object (Y-shaped) from 11 other objects, more or less similar to the reference. The scientists observed different, rat-specific recognition strategies, based on detecting the presence or absence of specific parts of the [object](#) in question. Through the use of computational models, developed in collaboration with Jakob Macke of the Caesar Research Center in Bonn, the authors have also succeeded in demonstrating that the highest levels of performance are associated with the perceptual strategies that are more complex, in terms of number and variety of visual features extracted from the image.

"These results not only confirm the validity of rodent models for the study of vision but can also have interesting applications," says Zoccolan, "The type of visual recognition strategies employed by rats seems to be quite advanced, and could be used as an inspiration for the improvement of artificial vision systems based on neural networks. Furthermore, measuring the complexity of perceptual strategies can be applied in studies using rodent models of psychiatric and neurological disorders, in which sensory perception is altered or distorted, as in [autism spectrum disorders](#)."

More information: Vladimir Djurdjevic et al, Accuracy of Rats in Discriminating Visual Objects Is Explained by the Complexity of Their Perceptual Strategy, *Current Biology* (2018). [DOI: 10.1016/j.cub.2018.02.037](#)

Provided by International School of Advanced Studies (SISSA)

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