

Encoding the Feedback Pathway of the Ventral Stream

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Submitter Tom Chen
Affiliation University of Toronto

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Presentation Abstract Summary Visual processing consist of feedforward and feedback pathways. The feedforward pathway processes the visual information with spread attention that focuses on generalizing the information, while the feedback pathway sends the global perception back to lower visual area to extract detail. Guclu and van Gerven (2015) have shown that the feature representations in a convolutional neural network can encode voxel responses with high accuracy. However, convolutional neural networks recognize objects in feedforward direction only. Therefore, the convolutional neural networks model may have only encode the feedforward pathway. In this research, I have look into what information are passed down through the feedback pathway. Specifically, an autoencoder is used to encode the voxel responses of the ventral stream to determine whether the features extracted by the decoder can represent the feedback pathway. The result shows that most of the voxels in V4 visual area are assigned to decoder layers. This suggests that the V4 visual area reconstructs visual information similar to the decoder of an autoencoder.

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Co-author Information

* Presenting Author

First Name	Last Name	Affiliation	E-mail
Tom *	Chen *	University of Toronto	tom79chen@gmail.com

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