Object Recognition as Evidence Integration in Recurrent Neural Networks

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Presentation Abstract Summary Recently very deep neural networks have risen in popularity, outperforming existing shallow networks. With this development to ever-deeper architectures it raises the question why the brain has not developed such architecture. Besides wiring constraints we argue that the brain operates under different circumstances when performing object recognition, being confronted with noisy and ambiguous sensory input. The role of time in the process of object recognition is investigated, showing that a recurrent neural network is able to integrate evidence about an object's identity over time. When trained with reinforcement learning the agent is able to learn the amount of time needed to come to an accurate estimate of the stimulus. The behavior and activity of the network are similar to findings from human and animal studies of perceptual decision-making.

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