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Eye-hand coordination caught in the act

The success of complex perceptuo-motor actions like catching depends on integrated, simultaneous use of cortically coded properties of ball and hand movement, as well as relations among these. Although the neural control of catching has received sparse attention in the neuroscience literature, behavioral observations have led to the identification of control principles that may be embodied in the involved neural circuits. I present experimental and modeling work performed to gain more insight into these principles and their neural basis. The empirically observed hand movements suggested that position and velocity information, coded in gaze-centered coordinates, directly plays into the generation of motor commands for catching. These findings were formalized in a dynamical neural network model that functionally interprets a broad range of neurobiological and behavioral data. This model underscores how the act of catching can be performed without internally reconstructing the physical ball trajectory.

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