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Constructing reality

When I teach about the nature of science I often use optical illusions to illustrate why we measure things in science. The point I try to make is scientist don't measure and quantify things because we are bean counters by nature but rather because measurement allows us to get beyond how our brains interpret reality for us.

Recently Mark Changizi of Rensselaer Polytechnic Institute has come up with a grand theory that attempts to provide a synthesis of how all classes of optical illusions work. The foundation for his theory is that our brains have an ability to predict the future.

Now I am not going all new age here. It turns out that there is a lag of about a 10th of a second between the arrival of a stimulus and our perception of that stimulus. In the real world that 10th of second can be critical for things like avoiding predators or other threats such as a car running a red light on 23rd Street. To compensate, the brain attempts to predict where objects will be 1/10th of a second into the future and it is this ability that accounts for the way optical illusions fool our brain.

See [this article in LiveScience](#) for a brief summary of Changizi's ideas.

I have not read the details of his theory but there clearly is a connection between many optical illusions and motion. If you are not convinced, or even if you are check out these simple but entertaining illusions. Warning! you might get sea sick.

Anomalous motion illusions

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June 18, 2008

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