



# RESEARCH2REALITY

Shining a light on research & innovation.

## What You See Isn't Always What You Get

**Doug Crawford**, Neuroscientist, York University, Scientific Director, Vision: Science to Applications (VISTA)

Vision research is critical because as humans, we really rely on vision for so much of the way we perceive and interact with the world. I got into all this because I was excited about neuroscience and how the brain works, and studying how the vision guides action. Because it permeates so many aspects of our lives, it seemed like a great way to do that.

### How does your research work?

My own research involves the integration of vision and action. So how the brain uses vision to control things like movements of visual gaze, eye-hand coordination, grasping, this sort of thing. So the three specific areas that I look at are something called trans-saccadic integration, where the brain has to piece together images that we see during different visual fixations, using vision to guide where we look, and then also using vision to guide our hand movements.

But one thing I do that really no one else is doing in the world, is examining the three-dimensional aspects of how the eyes and the head rotate as we move gaze around ourselves and glance at different things, and how different brain structures contribute to that function.

### What new advances are upcoming in your field?

Collaboration has become so important for vision research and research in general these days, because if you want to get at the big questions, often you have to gather together both the theoretical knowledge and also the ability to



use different technologies. That's very much the case for my research and our VISTA program, where we're bringing together computer scientists, neuroscientists, and people in the arts, to go after those big questions.

So much of the brain involves vision that most neurological disorders affect this in some way. We all want to live a long life, but none of us wants to get old, and that's something we need to think about in the future, as our population ages and medicine is able to advance longevity. We can add to that both by understanding the brain itself and by developing technologies that will extend the quality of our life, and which I very much expect will spin off into products that we all end up using with our kids.