ABSTRACT: We examine the scenario of a 3D physical world where an agent needs to seek and acquire visual information to complete a task. Whether using human eyes or artificial sensors, an agent directs where, when, and how to obtain a visual sample from the world. A visual fixation is directed to a location of interest, from a particular view location, at a specific time and with appropriate sensor settings. We have new human experimental evidence that now provides the why of fixation selection. Fixation sequences represent the observable trace of an active internal algorithm seeking external data. The eye, head and body movements that define the viewpoint depend on the task-related progress of the underlying computations, which in turn depend on the data those fixations acquire: they are causally connected. In fact, humans seem to have a suite of visuospatial algorithms, which we term Cognitive Programs, that they assemble, orchestrate, and deploy with impressive accuracy, on demand and without training, even in novel circumstances.

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