

# Inference of cognitive state from gaze behaviours

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Eye movements provide one of the few means to glimpse the workings of cognitive mechanisms during the performance of a task. It is difficult, however, to make a direct link between the target of gaze and cognitive states for several reasons. Perhaps the most significant of these is the fact in many tasks we may encounter intervals of non-visual cognition, during which they eyes are open (and may be engaged in passive monitoring), but are not actively engaged in seeking and extracting information from the environment. Conversely, during intervals of active visual cognition, we can observe distinct patterns of eye movement corresponding to distinct operations. For example, active searching can be characterized by a rapid series of brief fixations, while active visual analysis of a localized target will exhibit longer fixations. For a given task, particular elements of the scene may have special significance; interpretation is aided by expert knowledge, but blind discovery of coarse state categories may also be possible. In this talk I will present a preliminary taxonomy of eye movement states, illustrated with examples from a study of helicopter navigation.