The goal of the CoVE project is to use the BP Visualization Center to build Immersive Virtual Reality scenes that help people with cognitive disabilities.

Visual Cognition in Alzheimer Disease

The long-term research goal of this project is to develop a visual cognitive test battery, using computer-based visual images, that will identify persons likely to progress to Alzheimer disease prior to their meeting conventional diagnostic criteria. Tests based on the ability to recognize objects visually are used because visual processing deficits occur early and frequently in patients with AD, and such visual dysfunction can progress independent of memory impairment.

In one type of test currently being developed, subjects are asked to view a 3D object displayed in the BP Center’s virtual reality, Immersive Virtual Environment (IVE). Initially, the object is presented in an unfamiliar view and then slowly rotates into a more familiar view. The subject stops the rotation as soon as the object is recognized. Based on preliminary studies, the current hypothesis of this work is that patients likely to progress to AD need to have more of the object revealed before they recognize it, than do age-matched normal controls. An illustration of such a test is shown in this figure of a pencil that would rotate continuously from the view in position (a) to position (c).

Movies of other test objects rotating can be seen at the URL in the Contact Information, including a bottle, tree and chair. Further development of this work will include images in which an object can only be identified based on its motion or color.

There are over 4000 patients with mild amnestic cognitive impairment involved in treatment trials aimed at prevention of AD or the slowing of its onset. However, not all patients with minimal memory impairment will develop AD, and the ability to predict which patients will progress to AD is crucial for development of early drug treatments that prevent disability from the disease.

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