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Responsive Dynamic Three-Dimensional Tactile Display (System)

The most common interface between electronics and humans is a keyboard and optical display, thus modern electronics are largely visually based. However, for the visually impaired, this interface has fundamental limitations. Because of this, the percentage of visually impaired people who use computer electronics is low. Voice systems were created to overcome this limitation; however, they are highly ineffective and inaccurate. Therefore, alternative interfaces, which provide information on texts, images and even videos, especially those which can be used by visually impaired people, are highly desired.

Researchers at Arizona State University have developed a breakthrough responsive, dynamic, 3D interface to communicate between a person and information. This interface converts information in text, optical images or video to 3D topological information in real time. This allows visually impaired people to observe the change in a tactile manner, and non-visually impaired people to observe the change visually. 3D rendered topology features provide more information compared to 2D displays, and this tactile 3D display can integrate different sensing functions, such as force and movement, to produce interaction between the device and the user. This technology provides a fully functional tactile interactive interface between electronics and humans and enables visually impaired people to interact with electronic devices which had previously been unusable for them, such as smart phones, tablets and computers.

Potential Applications

- Assist the learning experience of visually impaired people
- Tactile gaming interface
- Refreshable 3D topological display
- 3D Map

Benefits and Advantages

- Tactile and 3D topology information is provided vs flat 3D optical displays
- Allows for human-machine interaction by integrating sensing functions
- Responsive and refreshable – highly sensitive to input stimuli
- Rapid deformation to generate 3D displays

For more information about the inventor(s) and their research, please see [Dr. Rogier Windhorst's directory webpage](#)[Dr. Debra Baluch's directory webpage](#)[Dr. Hanqing Jiang's directory webpage](#)[Dr. Lenore Dai's directory webpage](#)[Dr. Hongyu Yu's directory webpage](#)

