2-DoF Wearable Fingertip Cutaneous Display for Normal and Shear Forces

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Technology description

Wearable fingertip devices having two degrees-of-freedom (DoF).

Background

Cutaneous devices provide one or more types of skin stimulation. Some cutaneous devices provide skin stimulation to a fingertip. In particular, some wearable fingertip devices can provide a slanted compressive force against a finger pulp (e.g., by a flat slanting surface with three degrees of freedom (DoF) compressed against the finger pulp using three independently operated pulleys). However, such devices tend to be complicated to manufacture or assemble, limited in the types of forces that can be applied, and/or not easily wearable or portable. Current devices may also be limited in the maximum degree of force provided (e.g., less than 2 N). Such devices cannot provide compressive forces and shear forces upon the same areas with a simple design, thereby limiting functionality and increasing cost. Thus, there is a need for a more advanced wearable device that allows for more comprehensive and controllable fingertip stimulation.

Technology Description

Researchers at the University of New Mexico, Arizona State University, and University of Siena have developed wearable fingertip devices having two degrees-of-freedom (DoF). This technology is capable of providing compressive force and/or shear force to a fingertip for controllable fingertip stimulation. This system will provide tactile information relevant to the user, including directional cues related to the directional aspect of the apparatus. These devices may be used for rehabilitation (e.g., hand grasping), for research (e.g. for neuroscience on human perception), for gaming (e.g., tactile feedback for enhanced virtual interaction), and many more potential applications.

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business communication (companies, entrepreneurs and investors) to these UNM technologies for licensing opportunities and the creation of startup companies.

Application area

2-DoF wearable cutaneous display for normal and shear forces
Portable and easily wearable
Can provide information about a computer interface or suggest directional cues to the operator of a computer, car, or various portable devices
Can provide touch feedback in applications where audible or voice cues are given
Reduces cognitive load by providing a conduit for communicating spatial and/or directional information
Applications in commercial force feedback devices, GPS navigation systems, teleoperators and simulators, mobile devices, and virtual reality technology
Research applications in neuroscience on human perception
Applicable to gaming scenarios with tactile feedback added to virtual interaction

Institution

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