

Project - Social-haptic communication

Deafblindness is a condition that hinders the individual's interaction with other people and the environment. This interaction can be facilitated with the use of social-haptic communication, which uses tactile gestures (haptic signals) made on the back by an interpreter/guide to convey non-verbal linguistic information, like facial expressions. The project's goal was to develop the prototype of a facial expression recognition system that would communicate this information to the user, using the social-haptic communication approach automatically. This was achieved through facial expression recognition software and spatiotemporal vibration patterns on a vest. The facial expression recognition software analyses the facial image acquired by the camera and classifies a given expression in anger, happiness, sadness, surprise or neutral expression. The four non-neutral expressions recognized by the software are communicated to the user through spatiotemporal vibration patterns that simulate haptic signals. This allows the user to be more independent from interpreter/guides. The vest was made out of neoprene, for comfort, and its size can be easily adjusted to fit different corporal dimensions. The facial expression recognition software presented satisfactory accuracy. Tests with the target group were conducted in the Novo Hamburgo's Association of the Visually Impaired and with the deafblind Alex Garcia. The results showed that the vest works well and that it's possible to easily learn and distinguish between the spatiotemporal vibration patterns. This project was developed by Gabriel Schutz de Souza with mentoring from Lucas Luis Gutkoski and Alex Garcia, at Fundação Escola Técnica Liberato Salzano Vieira da Cunha, in Novo Hamburgo – RS, Brazil. It has participated in MOSTRATEC – International Science Fair in 2015 and is going to participate in the Proyecto Multimedia Science Fair in Guadalajara – Mexico and in the Stockholm International Youth Science Seminar in 2016. The project had the support of deafblind Alex Garcia, who wrote a letter with his opinion and an interview about the project. Contact: Gabriel Schutz de Souza – gabrielsouza@me.com