
Tactile Simulation of Textile Fabrics: Design and Control of the Simulation Signals

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Abstract

The aim of this project, named TacFib, is to simulate the touch of textile surfaces thanks to a tactile simulator, named STIMTAC, by modulating the contact friction. This project has many applications, from the co-design of tactile prototype to the e-commerce for garments. In this study, there are three main steps that will be addressed: i) the acquisition of pertinent tribological signals between 6 fabrics and an artificial finger, ii) the definition of a systematic signal processing to design the control signals used to simulate the fabrics, and iii) the evaluation of the stimulator performance as regarding the tactile perception from a trained panel.

An artificial finger was rubbed against the 6 fabrics following an identified protocol. The signals from the normal and tangential forces are processed to obtain a signal representing the contact between the finger and the fabric and used to control the stimulator.

The performance evaluation is done by comparing the perception intensity obtained by a trained panel on the real and virtual fabrics, i.e. simulated fabrics with STIMTAC, through three descriptors: smooth/rough (Rp), unpleasant/pleasant (Pp) and slippery (Sp). The approach is to compare the ‘hand’ obtained with the real and virtual fabrics.

Keywords: Tactile stimulator, friction, induced vibration, perception

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