

# Thermal sensory feedback system



Left panel: an embodiment of the active thermal skin (ATS) sensor which allows to mimic temperature dynamics of the skin temperature (see insert). Right panel: example of an application of the thermal sensory feedback system applied to an upper limb amputee.

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Keywords

Prosthetics, amputee, spinal cord injury

Intellectual Property

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## Description

The perception of temperature is important for the effective and safe manipulation of objects, perception of wetness, as well as affective touch. The technology is a thermal feedback system that can be used to restore the thermal sensation of a subject's body part that is missing or has lost such capacity - target region- (e.g. in amputees or spinal cord injury), this without any invasive direct neural stimulation.

The thermal feedback system relies on an active thermal sensing module (ATS) and a control module that dynamically activates a thermal display. The ATS is applied in a target region and sensitive to small shifts in temperature gradients that mimics temperature dynamics of the skin temperature. The thermal display provides heat exchange to the skin and placed on a body part capable of thermal sensation,

optionally projecting phantom thermal sensation in the target region.

## Advantages

The technology provides a non-invasive system that improves restoration of natural thermal sensation.

## Applications

- Prosthetic devices upper and lower limb
- Neural disorders e.g. stroke, spinal cord injury