

### **Thermoelectric Tactile Display (BGN)**

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**T**actile displays have been implemented with a variety of technologies to stimulate tactile sensations. In this application, we propose a novel modulation modality based on the tactile sensation known as the Thermal Grill Illusion (TGI). TGI stimulation can generate a variety of perceived sensations, including stinging, burning, electrical currents, and non-painful heat. The different sensations are obtained by manipulating spatially adjacent, alternating warm and cool stimuli. A set of thermoelectric coolers that create the thermal stimuli comprise the display. The signals can be modulated on more than one plane, e.g., locus and time. Spatial organization of the warm and cold components is the primary manipulation.

Thermoelectric Tactile Display Spatial configuration of display with three thermal stimuli mounting on the forearm

### **Goals and Benefits**

Enriches the utilization of tactile sensation with a novel medium - ("a different ping")  
Generates signals that can convey gradual changes in the severity of an alert  
Generates sensations of electrical currents, stinging, and burning, none of which are painful or invasive

### **Potential Commercial Uses and Market**

Gaming Incorporable in both the controllers and the wearable outfits of home and arcade gaming interaction devices to enhance the gaming sensation  
Industrial and operational environment Display of covert alerts and warnings

### **Development Stage and Development Status Summary**

A prototype based on thermoelectric cooler system has been developed. Preliminary experimentation has provided data on the characteristics of the sensation, mostly in terms of spatial manipulation of the stimuli.


### **Researcher**

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### **Patent Status**

Patent Pending

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