Scratch Input

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What if any large surface - such as your walls, furniture, or skin - had ad hoc input capabilities?

Scratch Input is an acoustic-based technique that converts the sound of a fingernail dragged over the surface of any textured material into a gestural input command. Scratch Input also allows small mobile devices to appropriate any passive, unpowered surface for input using only a simple sensor and a decision tree or other machine learning algorithm. Now you can interact with your computer systems and other digital devices any way you like with superior convenience and significant personalization.

TARGET POPULATIONS:

- Cell phone & mobile device users
- The elderly
- People with mobility challenges

BENEFITS:

- Low cost
- Simple installation
- Easy to use
- Accurate
- Robust

ABOUT THE RESEARCH

Signal propagates through dense materials. Sound captured using the phones built-in microphone. – Same sound but with microphone coupled to the surface. Finger moves, accelerates & decelerates in a particular way. This interacts with the textured surface producing a unique frequency and amplitude profile. Features such as p-count and duration can be extracted allowing gestures to be classified using a decision tree or other machine learning technique. Detect using a stethoscope which acts as a vibrating diaphragm and a generic microphone. A high pass filter is used to remove lower frequency noises such as voice making the sensing system significantly more robust.

“Even in the home where we could deploy the computing infrastructure to convert large surfaces for input, the cost, difficulty, and intrusion of installation is often prohibitive. Scratch Input easily overcomes these barriers so that existing walls or furniture can quickly and inexpensively become input-capable.”

--Chris Harrison, Carnegie Mellon University

TO LEARN MORE: Visit http://www.chrisharrison.net/projects/scratchinput/index.html

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