

# from the labs

INFORMATION  
TECHNOLOGY

## Multi-modal Interfaces

Researchers are developing interfaces for simultaneous multiple user gestural interaction

**SOURCE: "MULTIMODAL INTERFACES FOR HUMAN COMPUTER INTERACTION"**

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**RESULTS:** Researchers at Hewlett-Packard Labs in India are developing interfaces for scenarios involving multiple present users interacting simultaneously with a vertical display from a distance. An example of this is photo sharing on a television, where one or more users may walk through a collection of photographs.

**WHY IT MATTERS:** While most gestural interfaces interpret only the hand position, and treat it as a cursor, the HP Labs team's gesture recognition interface interprets the hand pose as well, enabling an additional degree of freedom. The user can switch

seamlessly between pointing at an object of interest, panning the photograph, and rating the photo (using the *thumb up/down* hand poses). In addition to explicit inputs such as hand gestures and short speech commands, the gesture recognition interface also has implicit awareness of the attention, activity and identity of its users.

**METHOD:** By detecting lip activity (using a web camera), analyzing the direction of sound (using an array microphone), and recognizing faces, the interface can distinguish system-directed speech and/or gestural activity from ambient activity, identify the active user(s) from among a set of users, and personalize interfaces and interactions to specific users. The multimodal interaction framework includes recognizers for not only hand gestures and speech, but also for a variety of other input modalities including stylus, multitouch, and document images.

**NEXT STEPS:** Researchers are now exploring the role of additional modalities such as head pose and facial expressions. They are working on creating more

natural and expressive user interfaces for a gamut of devices and solutions that are also end-user customizable and adaptive.