

Z-Band: Wrist-Worn Sensor Enabling Subtle Hand Interactions

The increasing popularity of wearable technologies for enabling user input present unique challenges as traditional touch screens and controllers become less practical. The Z-band is a wrist-worn device, capable of detecting finger gestures as inputs through RF sensing of changes in hand impedance.

What is the Problem?

As technology is increasingly woven into the fabric of our everyday lives, the means with which we interact with it becomes increasingly important. Input devices relying on cameras or several sensors become bulky, and therefore impractical for subtle and effortless use in the everyday world. Especially in wearable devices, such input devices cannot overly limit mobility or require obtrusively large gestures or interactions to function. In next-generation wearable devices that interface us with the ubiquitous electronic systems surrounding us, it is crucial to strike a balance between the functionality and the user experience.

What is the Solution?

The Z-band is a wrist-worn bio-impedance sensing device that recognizes finger gestures using RF signals. Using the hand itself as an antenna and a novel architecture for RF sensing, changes in the measured returning signal reflect the changing bio-impedance of a hand making different gestures and motions. This allows the Z-band, with only one type of sensor, to capture subtle finger gestures without being mounted on the hand.

What is the Competitive Advantage?

The Z-band's primary advantage is its advances in intuitive, unobtrusive interaction in various scenarios. The tool was tested with applications for directional swiping and location selection on a tic-tac-toe board, gestures that are generalizable to a variety of use cases. Additional inputs to the controlling processor allow for expansion of the device's capabilities by addition of other types of sensing, all while minimizing the impact to the wearer's mobility.

References

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