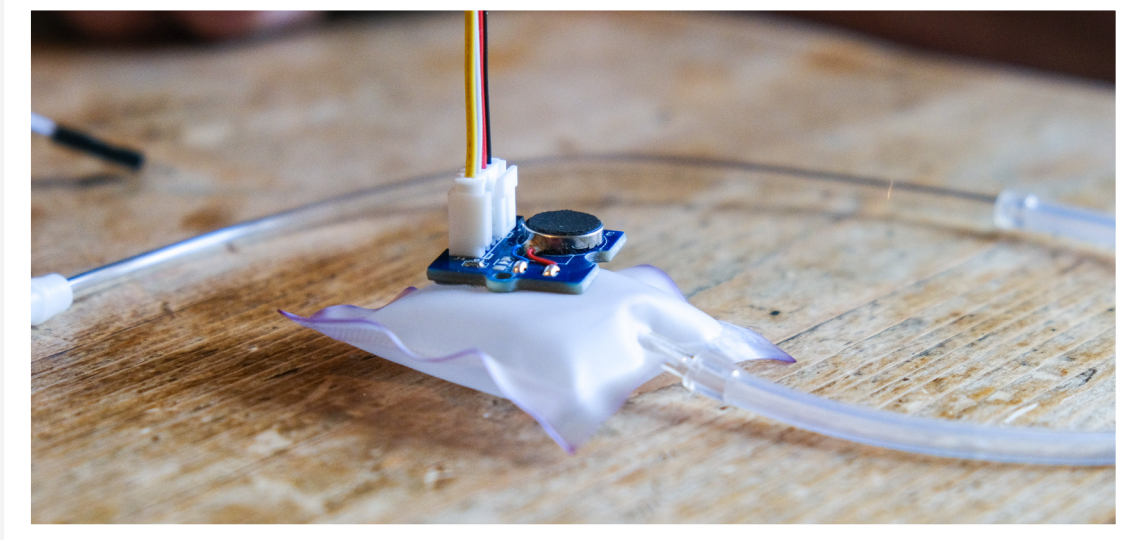


MOBILE TOUCH

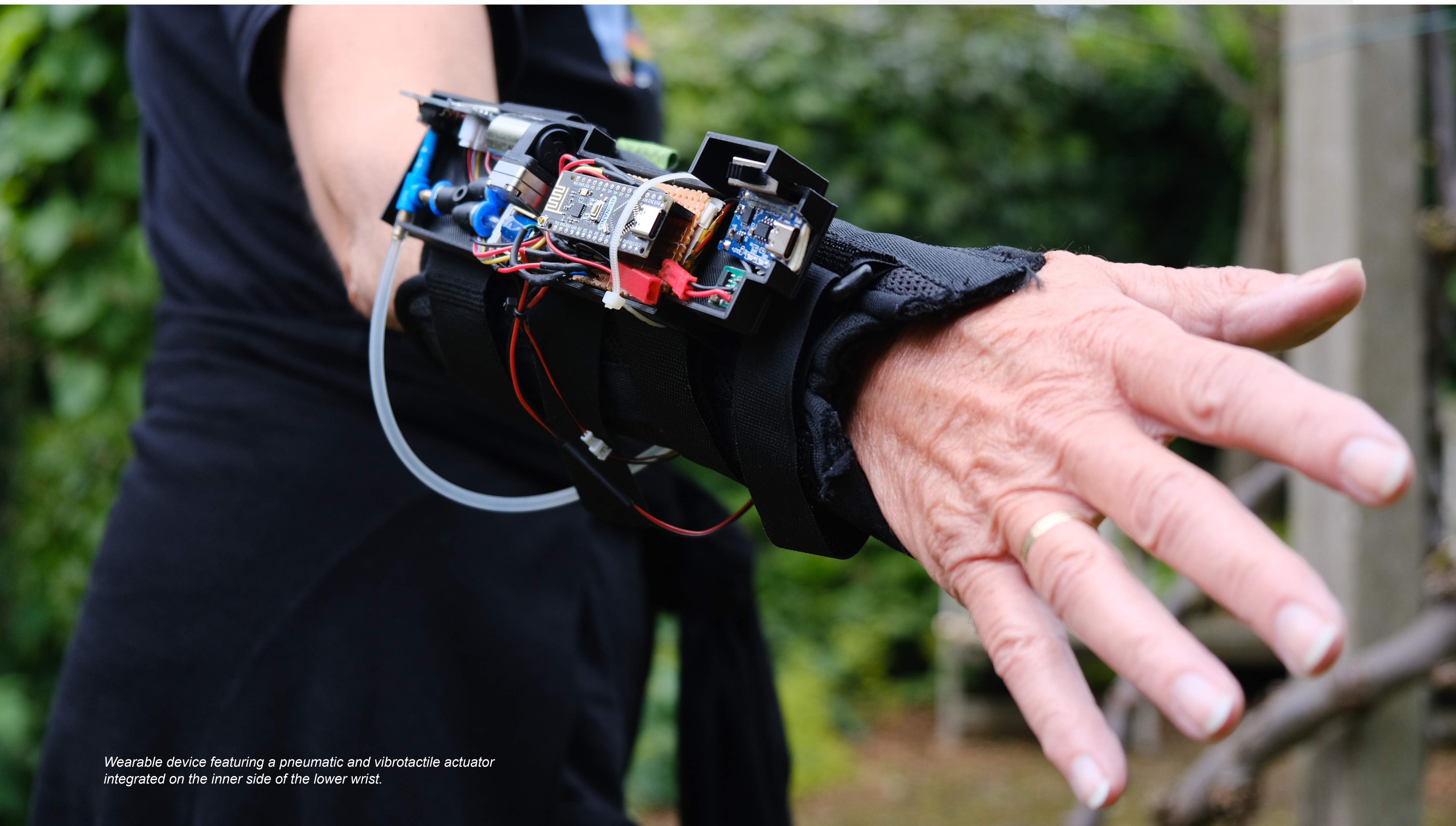
IMPROVING RESPONSE TIMES FOR PORTABLE PNEUMATIC WEARABLES

Pneumatic actuation is an effective method for recreating human touch sensations because it can apply pressure to the skin and has a natural softness. However, integrating this technology into fully wearable devices has proven to be difficult due to the lack of responsiveness with smaller pneumatic components, which limits the number of effective touches that can be portrayed.

Mobile Touch is a fully wearable system designed to deliver touch sensations to the wrist through a combination of pneumatic and vibrotactile actuation. By compensating for the inflation time of the pneumatic component with vibrations, the system's responsiveness is increased, allowing for the creation of more varied touch patterns. In addition, a wireless controller was developed that allows for programming touch patterns and directly transmitting touch wirelessly to the wearable device.



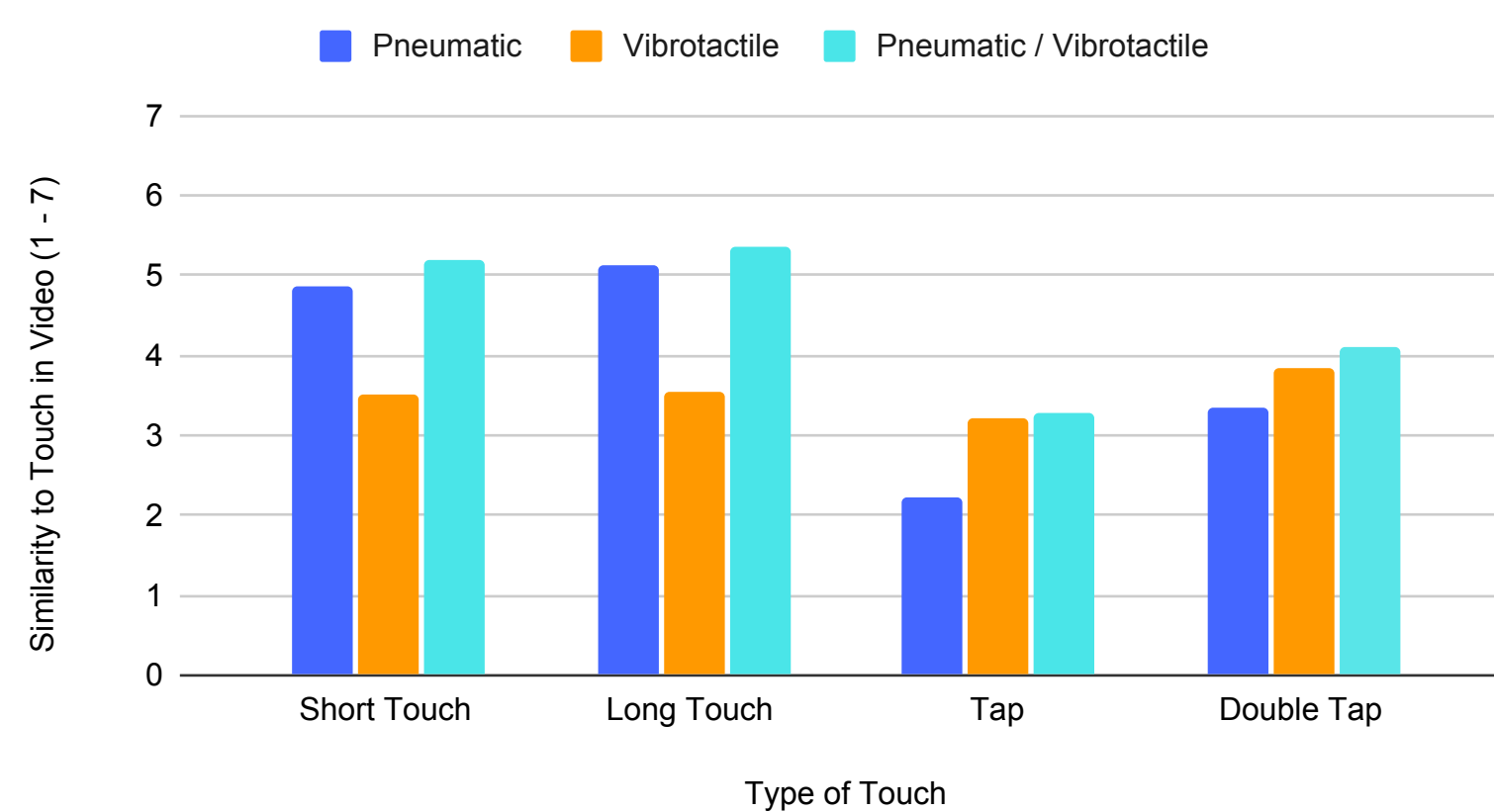
Pneumatic airbag + vibrotactile actuator.



Wearable device featuring a pneumatic and vibrotactile actuator integrated on the inner side of the lower wrist.



Wireless controller (left), user study results (top).



In the user study, the pneumatic-vibrotactile modality generally received significantly higher ratings for its similarity to human touch and pattern recognition by leveraging the strengths of each individual modality (n=35). Specifically, for longer touches, it was more effective due to its ability to mimic the softness of human skin and the pressure of a touch. For short taps, the vibrotactile component was clearer and enhanced the perceived realism.

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Mobile Touch
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Integrated Product Design

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