Haptic-Payment: Stimulating 'Pain' of Payment through Vibration Feedback in Mobile Devices

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The proliferation of mobile payment applications in recent years has further decoupled the physical act of paying from the consumption experience. Prior research suggests that this decreases the psychological 'pain' that consumers feel when making a purchase, and leads them to spend more money than they otherwise would.

The present research proposes a system that restores the physical sensation of paying to mobile payment apps. Drawing on a preliminary user study (151 participants), as well as prior theories on prehensile grip types and haptic vibration feedback thresholds, we develop a device consisting of an array of vibration motors that can be attached to the back of a mobile phone and can be controlled through a custom application to provide vibration feedback of varying frequencies and durations at the time of mobile payment.

Inner workings of our initial prototype.

Inner workings of our current prototype. In the new design we incorporate 5 haptic sensors with 5 vibration motors. Three of the motors are highlighted with Velcro so that we can customize location.

User Interface of the proposed in-store purchase app.

Our preliminary findings suggest that a configuration of vibration motors located around the right and left edges of the phone, and which give high frequency, short duration vibrations upon payment is the most effective way inducing the pain of payment.

Heat-map based on survey results of user perceived grip locations during mobile/smartphone payment

"Would you prefer a short duration vibration or a long duration vibration notification for the mobile payment app to notify you that money has been removed from your account?"

"Continuing to imagine that you are holding your phone and have pressed the PAY button in the mobile payment app... Would you prefer a weak (low frequency) vibration or a strong (high frequency) vibration notification for the mobile payment app to notify you that money has been removed from your account?"

"Which of the following four vibration notification types would you prefer to feel upon pushing the PAY button?"

"Which of the following four vibration notification types would make your mobile payment feel the most 'painful' upon pushing the PAY button (i.e., which one would you most closely associate with the negative feeling that your money is being withdrawn from your bank account)?"