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Linkage between touch behavior and touch feeling

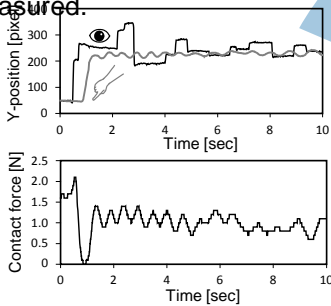
- Estimating tactile perception by analyzing hand motions -

Abstract

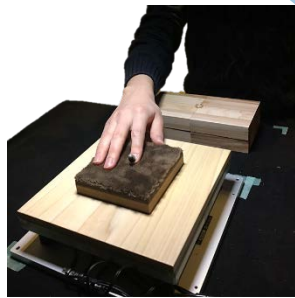
We actively move our hands when exploring the external world and acquiring information about an object's attributes. For example, we push an object to discern its hardness and stroke an object to determine its roughness. However, the role of hand motion in tactile perception has been largely overlooked. In this study, we investigated **whether tactile perception can be estimated by the analysis of hand and eye motions** and found that **these motions carry information about it**. Our findings will provide insights into the mechanisms of tactile perception as well as into the design of manual haptic interfaces.

Measurement & Analysis

I. Hand and eye motions during tactile exploration were measured.

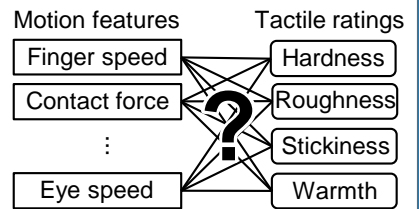


II. Motion features were extracted from hand and eye motions.



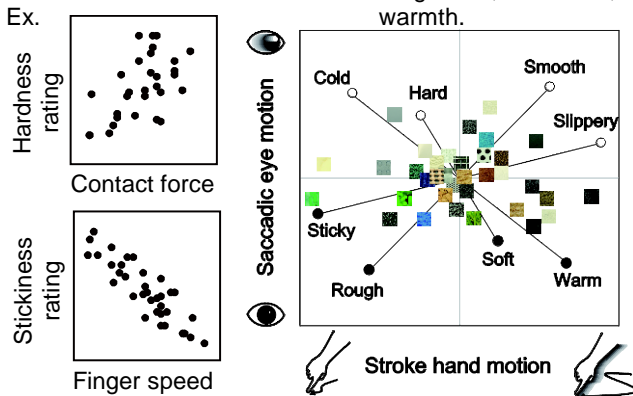
Warm and soft surface!

III. The relationships between motion features and tactile ratings were analyzed.



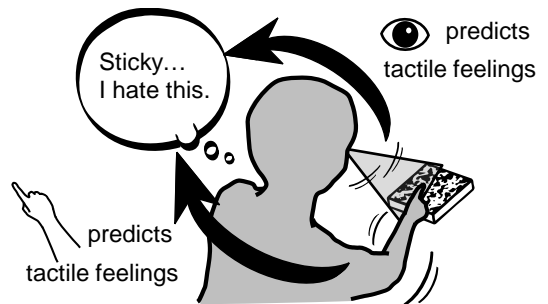
Findings

Hand and eye motion can explain hardness, roughness, stickiness, warmth.



Application

Estimation of tactile feelings by measuring body motions will be useful for subjective evaluation of haptic interfaces and haptic products.



Reference

[1] T. Yokosaka, S. Kuroki, J. Watanabe, S. Nishida, "Linkage between free exploratory movements and subjective tactile ratings," *IEEE Transactions on Haptics*, (in press), DOI: 10.1109/TOH.2016.2613055.

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