

# Scalable Eye Tracking for Mobile Devices

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## ABSTRACT

Eye tracking provides an effective solution to users' attention, interest, and engagement. While gaze estimation based on a standard camera can be versatile, it remains challenging to achieve an accurate, robust, and scalable solution on mobile devices. In this talk, I will describe three studies that aim to address these challenges. Specifically, 1) we found that screen reflection on user's cornea can be leveraged for gaze estimation and it considerably improves the practicability of indoor eye tracking. 2) We exploited gaze-hand coordination and applied interaction data for implicit calibration when a user naturally interacts with the computer. This can prevent users from tedious and intrusive calibration in practice. 3) We also proposed to train a multi-device person-specific gaze estimator to accelerate implicit calibration. It adapts the data from different personal devices to learn the shared mapping from user appearance into eye gaze. Taken together, these studies identify indicative eye gaze features, alleviate user calibration effort, and thus pave the way for scalable eye tracking in daily use.

holds a Ph.D. at the Hong Kong Polytechnic University, and he received his M.S. and B.S. degrees at Beihang University, China. His research interests include affective computing, human-computer interaction, gaze estimation, and pattern recognition.

## CCS CONCEPTS

- Human-centered computing → Human-computer interaction (HCI)

## KEYWORDS

Implicit calibration, Gaze estimation, Gaze-hand alignment

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## 1 BIO

Michael Xuelin Huang is a research scientist at Google, Mountain View, where he works on advanced human-computer interaction paradigms at the Android Research Group. Prior to joining Google, he was a postdoc at the Perceptual User Interface Group at Max Planck Institute for Informatics, Germany. He

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