

SMARTPHONE SENSORS

REVEAL

MORE

THAN YOU MIGHT THINK

Smartphones are jam-packed with a variety of sensors designed to enhance the user experience. But these sensors have a downside: they reveal deeply personal data that can be remotely collected and exploited by threat actors, advertisers and others in unintended and often unexpected ways.

CAMERAS AND MICROPHONES

FUNCTION

- Capture audio and visual data

KEY USE

- Audio/image/video capture
- Phone calls and videotelephony
- Voice assistants

POTENTIAL ABUSES

- Capturing private conversations
- Assessing private environments
- Stealing fingerprints
- Inferring inputs (via screen reflections on eyes)

INFRARED CAMERA SYSTEM

FUNCTION

- Performs facial recognition by scanning the user's face

KEY USE

- Biometric authentication
- Face-tracking augmented reality

POTENTIAL ABUSES

- Stealing face maps
- Mapping private environments
- Serving expression-targeted advertisements

PROXIMITY SENSOR

FUNCTION

- Measures the distance of an object from the touchscreen

KEY USE

- Screen management during a phone call

POTENTIAL ABUSES

- Determining user presence
- Verifying advertisement impressions

MOTION SENSORS

FUNCTION

- Measure the device's motion-rotation, acceleration, and direction

KEY USE

- Screen orientation
- Movement-based shortcuts
- Motion-based gaming

POTENTIAL ABUSES

- Inferring routes
- Inferring activities
- Inferring keystrokes for PINs and passwords
- Fingerprinting users (based on walking patterns)
- Fingerprinting devices (based on imperfections in sensor manufacturing)

AMBIENT LIGHT SENSOR

FUNCTION

- Measures the light level in the device's environment

KEY USE

- Adjustment of screen brightness

POTENTIAL ABUSES

- Inferring behavioral patterns
- Inferring browsing activity

GLOBAL POSITIONING SYSTEM (GPS) CHIP

FUNCTION

- Calculates the device's location based on satellite positioning

KEY USE

- Mapping
- Localized weather information
- Location-based alerts

POTENTIAL ABUSES

- Tracking locations and movements
- Serving location-targeted advertisements

BAROMETER

FUNCTION

- Measures the device's altitude based on ambient pressure

KEY USE

- Elevation mapping

POTENTIAL ABUSES

- Determining a user's floor within a tall building
- Determining whether a user is flying

