Access your device hardware with the W3C Generic Sensor API

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Agenda

01 Sensors and use cases
02 Current API
03 Generic Sensor
04 Final words
Building a game?
Accelerometer

Measure acceleration changes in 3 directions
Useful to register tilt, shake or steps
Affected by earth’s gravity

Gyroscope

Measure its own rotation
Can be affected by other components such as speakers or rotation
Noise problem
You can use high or low pass filters
-> introduce latency
Typically use “fusion sensors”
Relative Orientation
Implementing a night mode
Control lighting system
Ambient Light sensor
React to magnetic field changes
Magnetometer
How do you do that today?
DeviceMotion Event  
DeviceOrientation Event
Ambient Light or Magnetometer
Problems?
DOM Events
Frequency is hardcoded

http://www.wincarsracer.com/
Your connection is not private

Attackers might be trying to steal your information from sub.domain.com
(for example, passwords, messages, or credit cards). NET-ERR_CERT_AUTHORITY_INVALID

Advanced

Back to safety
Introducing Generic Sensor
Generic Sensor API
Editor’s Draft, 1 June 2017

This version:
https://w3c.github.io/sensors/

Latest published version:
https://www.w3.org/TR/generic-sensor/

Previous Versions:
https://www.w3.org/TR/2017/WD-generic-sensor-20170530/

Feedback:
public-device-apis@w3.org with subject line “[generic-sensor] … message topic …” (archives)
GitHub (new issue, level 1 issues, all issues)

Editors:
Tobie Langel (Intel Corporation) tobie@sensors.codespeaks.com
Rick Waldron (JS Foundation)

Other:
Test suite, latest version history, previous version history

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```javascript
const sensor = new Accelerometer();
sensor.start();
...

sensor.stop();
```
Track errors and value changes

```javascript
sensor.onerror = event => {}; 

sensor.onactivate = () => {}; 

sensor.onchange = () => { console.log(sensor.data)};
```
Request a frequency

```javascript
var sensor = new Accelerometer({frequency: 60});
sensor.start();
```
const sensor = new AbsoluteOrientationSensor();
const mat4 = new Float32Array(16);
sensor.start();
sensor.onchange = () => {
    sensor.populateMatrix(mat4);
    toEulerianAngle(sensor.quaternion, euler);
};
Privacy and security
- Secure context (only works with HTTPS)
- Top level browsing context (no iframes)
- Focused top level context
- Reducing sampling frequency
- Values are dispatched on active tabs
- Integration with Permission API
- Rounding sensor data precision
GamePad
Shipping status
Give Feedback

- API and integration
- Supply your use cases
- Suggest new fusion or deviated sensors
- How you would like the sensor data to be exposed
Make noise
Origin Trial in Chrome 61

- Accelerometer
- LinearAccelerationSensor
- Gyroscope
- AbsoluteOrientationSensor
- RelativeOrientationSensor
Other vendors showing interest
01. Motion sensors explainer
   https://www.w3.org/TR/motion-sensors/

02. W3C Generic Sensor spec
    https://w3c.github.io/sensors/

03. W3C Device API WG:
    https://lists.w3.org/Archives/Public/public-device-apis/

04. IRC/freenode/#chromium
    darktears, mpozdnyakov, riju, anssik

05. Twitter
    @darktears, @kennethrohde, @anssik